Drexel University

Undergraduate Course Catalog

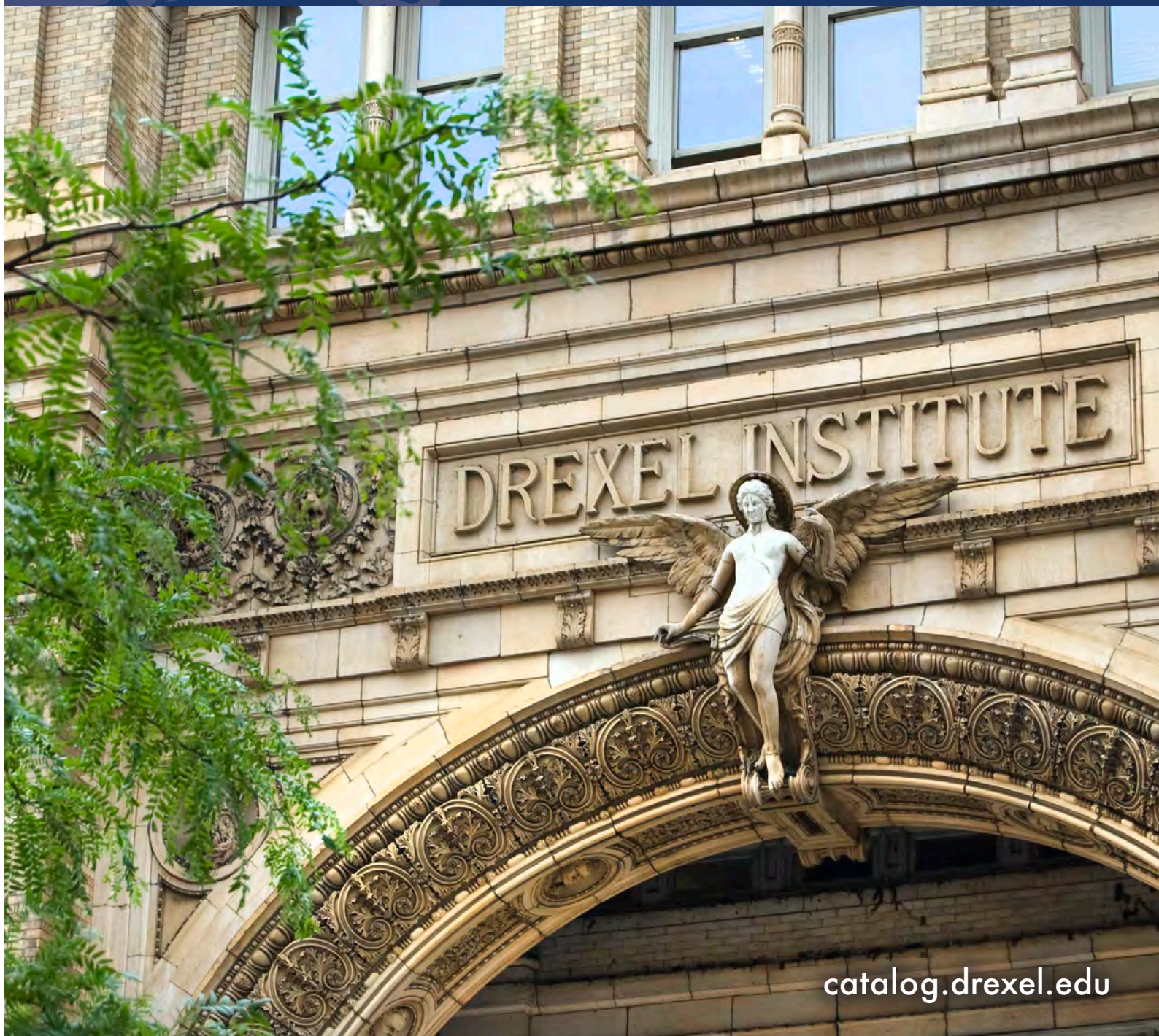## 2019-2020

catalog.drexel.edu

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About Drexel University

Mission Statement

Drexel University fulfills our founder's vision of preparing each new generation of students for productive professional and civic lives while also focusing our collective expertise on solving society's greatest problems. Drexel is an academically comprehensive and globally engaged urban research university dedicated to advancing knowledge and society and to providing every student with a valuable, rigorous, experiential, technology-infused education, enriched by the nation's premier co-operative education program.

Vision

Drexel will be the Philadelphia region's leading university excelling in high-quality experiential education, online learning, technology transfer and business incubation, translational research, and urban revitalization. Drexel will use and leverage all its assets - outstanding faculty, highly motivated students, over 150,000 alumni world-wide, a pragmatic and entrepreneurial culture, co-operative education, Drexel University Online, and our superior location as a major transportation hub - to create an accessible, relevant and market-leading educational research platform that benefits our diverse community of students, advances our scholarly work, and champions economic development in our region. Drexel will join the ranks of the most impactful and competitive universities in the United States at a time when the nation is clamoring for educational value, jobs, and new ideas for bolstering our economy.

A Brief History of Drexel University

In founding the institution that would become Drexel University, Philadelphia financier and philanthropist Anthony J. Drexel launched a tradition of innovation. Mr. Drexel envisioned an institution of higher learning uniquely suited to the needs of a rapidly growing industrial society and the young women and men seeking their place in it - core values that continue to guide the University in its modern era. Mr. Drexel's vision was realized in 1891 with the establishment of the Drexel Institute of Art, Science and Industry. Originally a non-degree-granting institution, Drexel began conferring bachelor of science degree in 1914, when its 18 departments were organized into four schools. In 1927, the Commonwealth of Pennsylvania granted Drexel the privilege to confer the master of science degree, and in 1965, the doctor of philosophy degree.

The cornerstone of Drexel's career preparation model has been its cooperative education (co-op) program. Introduced in 1919 as one of the first models of its kind, co-op is integral to the University's educational experience. Through co-op, students alternate periods of study with periods of full-time professional employment, providing unrivaled, valuable professional experience.

The institution's curriculum and organization of its academic programs have evolved to include 15 colleges and schools. Through its evolution, Drexel has undergone two changes in name - in 1936 becoming the Drexel Institute of Technology, and in 1970, Drexel University. The current title reflects the institution's commitment to research as well as the breadth of its academic programs.

Drexel's mission, services and opportunities expanded further in 2002 when MCP Hahnemann University, a major Philadelphia health sciences institution, merged with Drexel University with the addition of the College of Medicine (http://archives.drexelmed.edu/history.php), the College of

Nursing and Health Professions, and the recently named Dornsife School of Public Health. In 2001, the University established an affiliation with one of Philadelphia's most storied institutions, the Academy of National Sciences, now the Academy of Natural Sciences of Drexel University (http://www.ansp.org/about/academy-history/). These historic events extended the resources of Drexel have led to many productive synergies in teaching and research.

Drexel's foundation as an innovating institution established the university as a national leader in higher education. In 1983, Drexel became the nation's first university to require all undergraduates to have personal access to a microcomputer for use in all their coursework. The university continued its commitment to integrating technology when it became the first university to operate a fully wireless campus in 2000. In 2006, Drexel became the first major research university to open a new law school in 25 years. The Thomas R. Kline School of Law is one of only two US university law schools that follows a cooperative education model of learning.

Throughout its evolution to a comprehensive urban research university, Drexel's core mission has held constant. Since its founding, the institution has remained a privately controlled, nonsectarian, coeducational center of higher learning, distinguished by a commitment to preparing women and men for success in their chosen careers incorporating experiential learning and celebrating diversity. Its greatly expanded enrollment, campuses, and curricula reflect a history of responsiveness to societal and individual needs - all of which Mr. Drexel sought to address in his day and going forward through his charge "change."

Drexel University Today

Today, over 25,000 students are enrolled in over 100 undergraduate programs and over 190 graduate programs across 16 colleges, schools, and centers:

- Close School of Entrepreneurship (http://drexel.edu/close/)
- College of Arts and Sciences (http://drexel.edu/coas/)
- College of Computing & Informatics (http://drexel.edu/cci/)
- College of Engineering (https://drexel.edu/engineering/)
- College of Medicine: School of Biomedical Sciences and Professional Studies (https://drexel.edu/medicine/academics/graduate-school/)
- College of Nursing and Health Professions (https://drexel.edu/cnhp/)
- Dornsife School of Public Health (http://drexel.edu/dornsife/)
- Drexel College of Medicine (http://drexel.edu/medicine/)
- Goodwin College of Professional Studies (http://drexel.edu/goodwin/)
- LeBow College of Business (http://www.lebow.drexel.edu/)
- LeBow College of Business: School of Economics (http://www.lebow.drexel.edu/faculty-and-research/disciplines/economics/)
- Pennoni Honors College (https://drexel.edu/biomed/)
- School of Biomedical Engineering, Science, and Health Systems (http://www.biomed.drexel.edu/)
- School of Education (http://drexel.edu/soe/)
- Thomas R. Kline School of Law (http://www.drexel.edu/law/)
- Westphal College of Media Arts and Design (http://www.drexel.edu/westphal/)

Drexel Co-op

Drexel University has been a pioneer in cooperative education since 1919 — operating one of the largest cooperative education programs in the nation. Undergraduates alternate on-campus study with full-time

employment in fields related to their academic interests. More than 1,600 employer organizations in business, government, health care and education participate at locations in more than 30 states and 45 countries. The Steinbright Career Development Center (http://drexel.edu/scdc/) (Steinbright) works to ensure that students and alumni get the most from their experiential and career education activities.

Technology

Technology is integrated into every aspect of the Drexel educational experience, marking the university as a leader in educational innovation.

Drexel made history in 1983 when it became the first university to mandate that all students must have personal access to a microcomputer. This tradition of leadership in integrating state-of-the-art technologies into a Drexel education continued when Drexel, in early 1998, inaugurated the first totally wireless library in the nation. In 2000, Drexel again made history by becoming the nation's first major university to offer completely wireless Internet access across the entire campus.

A pioneer in online learning, Drexel offers distance education programs leading to certificates and degrees in areas including engineering management, business administration, information systems and library and information science. Drexel University Online has over 7,500 unique students from all 50 states and more than 20 countries pursuing one of more than 130 graduate and undergraduate degree and certificate programs. Over all, there are more than 13,000 Drexel University students taking at least one course online.

Drexel is widely recognized for excellence in technology-based, experiential learning and was ranked in the top third in the 2019 edition of *U.S.News & World Report's* "Best National Universities," coming in at 102nd out of 312.

Location

Drexel's 74-acre University City Main Campus is located in the vibrant University City district of Philadelphia, Pennsylvania. Drexel makes full use of its metropolitan setting by integrating Philadelphia and its resources into the classroom, co-op/internship experience, and student life, making it a model for other urban universities. The main campus is a 10-minute walk from Center City, the core of Philadelphia's commercial and business district.

Drexel teaches at two additional Philadelphia campuses: the Center City Campus houses the College of Nursing and Health Professions and the Queen Lane Medical Campus in East Falls houses the College of Medicine. The Law School also operates the Kline Institute of Trial Advocacy in Center City.

Programs of note

Civic Engagement
Civic engagement, participation in the public life of the community, is important to the Drexel University's strategic plan. Civic engagement can take many forms from volunteerism doing community service to electoral participation and advocacy.

Drexel University's Lindy Center for Civic Engagement (http://www.drexel.edu/lindycenter/) fosters a culture of civic responsibility by providing programs and resources that empower Drexel students and the broader university community to expand their civic identities through engagement in mutually beneficial partnerships that lead to a more just society.

The Lindy Center for Civic Engagement focuses on four core priorities including: Community-Based Learning, Civic Leadership, Public Service, and Community Partnerships.

Honors Program
The Pennoni College offers several academic options for its students. These opportunities are designed to be intensive, and are taught by faculty members who understand and accommodate Honors students' abilities and aspirations.

The Honors Program offers several academic options for its students. These opportunities are designed to be intensive, and are taught by faculty members who understand and accommodate Honors students' abilities and aspirations.
These options include:

- **Honors Colloquia**: These interdisciplinary courses introduce students to topics not typically covered elsewhere. These courses are small, discussion-based, seminar style classes. Past Honors Colloquia topics include: The Hidden God in Cinema; Theory of Special Relativity; The Graphic Novel; Torture and Terrorism, and many others.
- **Honors-Section Courses**: These courses fulfill traditional major requirements but offer Honors credit. While the subject remains the same, the classes are taught to smaller groups, consisting entirely of Honors students, and on an advanced level that encourages discussion and practical application. Honors-section courses include, among other subjects, physics, English, business, general psychology, chemistry, and biology.
- **Honors Options**: With permission from their instructors and approval from the Honors Program, Honors students may elect to enhance non-honors courses to yield honors credit. The student and faculty member conducting may agree on the specific terms before the course begins and jointly submit a proposal to the Honors Program.
- **Independent Study**: Honors students frequently come across topics in their general coursework that they would like to investigate in greater detail. To accommodate this, the Honors College encourages students to study and research a topic of their choosing with guidance from a faculty member.

The Symposium
The Symposium (https://drexel.edu/pennoni/custom-designed-major/the-symposium/) is an interdisciplinary, project-based course series exploring subjects of the broadest possible interest and greatest societal impact. Through intensive examination of a different major these every year, it brings Drexel University students, teachers, and visiting expert lecturers into collaboration. The Symposium strives to avoid the "textbook approach," with an emphasis on developing in students the active skills of interdisciplinary inquiry: reading, writing, critical thinking, methodological creativity, and argument. Four new courses are offered each year, designed to elaborate different dimensions of the theme. Through these courses, students are encouraged to see the University as an interconnected enterprise, and to imagine the University as one part of a larger spectrum of scholars in the communities of the city, the nation, and the world.

ROTC
The Army Reserve Officers' Training Corps (http://www.armyrotc.com/edu/drexel/), established at Drexel in 1918, is an integral part of the University. Army ROTC courses are open to all students, and enrollment alone does not carry a military obligation. Students selected for the advanced course (normally pre-junior, junior, and senior years) will complete their academic and military studies concurrently, and upon

graduation will be commissioned as lieutenants in the United States Army, Army Reserve, or Army National Guard. Participation in the advanced course may qualify participants to receive financial aid through a series of scholarships and cooperative education programs. For further information, contact the Professor of Military Science, Drexel University, The Armory, 33rd and Market Streets, Philadelphia, PA 19104.

Drexel students are eligible to participate in the Naval Reserve Officers' Training Corps (http://www.vpul.upenn.edu/nrotc/) (NROTC) through a cross-enrollment agreement with the University of Pennsylvania. All naval science courses are held on Penn's campus. The NROTC program enables a college student to earn a commission in the Navy or the Marine Corps while concurrently satisfying requirements for his or her baccalaureate degree. Scholarship and nonscholarship programs are available.

Drexel students are eligible to participate in the Air Force Reserve Officers' Training Corps (http://www.sju.edu/afrotc/) (AFROTC) through a cross-enrollment agreement with St. Joseph's University. All aerospace studies courses will be held on the St. Joseph's campus. The AFROTC program enables a college student to earn a commission as an Air Force officer while concurrently satisfying requirements for his or her baccalaureate degree.

Global

Study Abroad
Drexel University's Study Abroad programs are open to students in all disciplines who meet the qualifications of each individual program. Please see the study abroad website (http://www.drexel.edu/studyabroad/) for eligibility requirements of each individual program and for the most up to date program offerings.

Foreign Language Proficiency
The University awards an advanced-level Certification of Proficiency (http://catalog.drexel.edu/certificates/proficiencycertificates/) in a foreign language in recognition of exceptional ability in oral and written communication in that language. Certification is listed on the official college transcript.

Examinations leading to proficiency certification include listening comprehension, reading comprehension, and written analysis, and the ETS Achievement Test, which is also the qualifying examination for proficiency testing. Certification also requires successful completion of an extensive oral interview, with at least a "2" rating on the FSI/ACTFL rating scale. Certification indicates proven ability to function effectively in professional and social situations in a country in which the target language is spoken.

Affirmative Action and Equal Opportunity

University Policy: Affirmative Action and Equal Opportunity
It is the policy of the University to provide a working and learning environment in which employees and students are able to realize their full potential as productive members of the University community. To this end, the University affirms its commitment to equal opportunity and nondiscrimination in employment and education for all qualified individuals regardless of race, religion, color, national origin, sex, age, sexual orientation, disability or applicable veteran status or any other characteristic protected by applicable federal or state law. Further, the University is committed to taking affirmative action to increase opportunities at all levels of employment and to increase opportunities for participation in programs and activities by all faculty, staff, and students.

Affirmative Action is directed toward racial and ethnic minorities, women, persons with disabilities, and Vietnam-era veterans. All member of the University community -- faculty, staff, and students – are expected to cooperate fully in meeting these goals.

It is the policy of the University that no qualified individual with a disability shall, on the basis of the disability, be excluded from participation in University programs and activities. Disability is defined as any physical or mental impairment that substantially limits one or more major life activities; or having a record of such impairment; or being regarded as having such impairment. A qualified individual with a disability means an individual as defined above, who is capable of performing the essential functions of a particular job or of participating in a particular course of study, with or without reasonable accommodations for his/her disability. Reasonable accommodations are determined on a case-by-case basis.

Consumer Information and Student Right to Know

In accordance with federal regulations set forth by the Higher Education Opportunity Act of 1965, as amended, a summary of consumer information must be made available to all prospective and enrolled students at Drexel University. Links to the information is available on the Office of the Provost's website (http://drexel.edu/provost/policies/heoa/).

Accreditation

Drexel University's educational programs are accredited by MSCHE (Middle States Commission on Higher Education).

The Antoinette Westphal College of Media Arts and Design

- The National Association of Schools of Arts & Design has accredited Westphal's Bachelor of Science programs in: Animation & Visual Effects; Art History; Design & Merchandising; Entertainment and Arts Management (Visual Arts); Fashion Design; Film & Video; Game Art & Production; Graphic Design; Interactive Digital Media; Interior Design; Photography; Product Design; TV Production & Media Management.
- The National Association of Schools of Arts & Design has accredited Westphal's Master of Science programs in Digital Media; Fashion Design; Interior Design; and Design Research
- The National Association of Schools of Arts & Design has accredited Westphal's Doctor of Philosophy in Digital Media.
- The Architecture program is accredited by NAAB (National Architectural Accrediting Board).
- The BS in Interior Design is accredited by CIDA (Council for Interior Design Accreditation).
- The MS in Interior Architecture & Design is accredited by CIDA (Council for Interior Design Accreditation).

The Bennett S. LeBow College of Business

- The Bennett S. LeBow College of Business is accredited by AACSB (Association to Advance Collegiate Schools of Business).

The College of Engineering

- The undergraduate programs for Architectural Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering Environmental Engineering, Materials Science and Engineering, and Mechanical Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.
- The undergraduate Construction Management program is accredited by ACCE (American Council for Construction Education).
- The undergraduate Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org.
- The Project Management program is approved by the Project Management Institute (PMI)® as a Registered Education Provider (R.E.P.). This designation indicates that Drexel has met or exceeded rigorous standards for the quality and the effectiveness of its program as defined by PMI, http://www.pmi.org/learning/training-development/reps (http://www.pmi.org/learning/training-development/reps/).

The College of Arts and Sciences

- The Chemistry BS is certified by ACS (American Chemical Society).
- The Clinical Psychology PhD program is accredited by APA (American Psychological Association).
- The English Language Center is accredited by CEA (Commission on English Language Program Accreditation).

The College of Nursing and Health Professions

- The Baccalaureate Degree in Nursing (BSN), the Master's Degree in Nursing (MSN) and the Doctor of Nursing (DNP) at Drexel University are accredited by the Commission on Collegiate Nursing Education (CCNE) (http://www.aacn.nche.edu/ccne-accreditation/), One Dupont Circle, NS, Suite 530, Washington, DC, 20036, 202-887-6791.
- The Couple and Family Therapy MFT degree and Post-Master's Certificates are accredited by COAMFTE (Commission on Accreditation of Marriage and Family Therapy Education).
- The Creative Arts Therapies MA degrees in Dance/Movement Therapy and Counseling, Music Therapy and Counseling, and Art Therapy and Counseling are approved by the ADTA (American Dance Therapy Association), the AMTA (American Music Therapy Association), and the AATA (American Art Therapy Association), respectively.
- The Didactic Program in Nutrition is accredited by ACEND (Accreditation Council for Education in Nutrition and Dietetics Association).
- The Nurse Anesthesia program is accredited by COA (Council on Accreditation of Nurse Anesthesia Educational Programs).
- The Doctor of Physical Therapy (DPT) program is accredited by CAPTE (Commission on Accreditation in Physical Therapy Education).
- The Physician Assistant program is accredited by ARC-PA (Accreditation Review Commission on Education for the Physician Assistant).

The College of Computing & Informatics

- The BS in Computer Science is accredited by the Computing Accreditation Commission (CAC) of ABET (http://www.abet.org).
- The BS in Information Systems is accredited by the Computing Accreditation Commission (CAC) of ABET (http://www.abet.org).
- The BS in Information Technology is accredited by the Computing Accreditation Commission (CAC) of ABET (http://www.abet.org).
- The BS in Software Engineering is accredited by the Engineering Accreditation Commission (EAC) of ABET (http://www.abet.org).
- The MS in Library and Information Science is accredited by ALA (American Library Association).
- The MS in Health Informatics Program is in Candidacy Status, pending accreditation review by the Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM)

The Drexel University College of Medicine

- The MD degree is accredited by LCME (Liaison Committee on Medical Education).
- The Master's program in Histotechnology (MHP) and the MS Degree in Pathologists' Assistant program are accredited by NAACLS (National Accrediting Agency for Clinical Laboratory Sciences).

The Dornsife School of Public Health

- The Dornsife School of Public Health is accredited by CEPH (Council on Education for Public Health).

The School of Biomedical Engineering, Science and Health Systems

- The undergraduate biomedical engineering curriculum is accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org).

The School of Education

- Teacher education, school leadership and other programs leading to Pennsylvania State-issued credentials or endorsements for various PreK-12 subject areas are approved by the Pennsylvania Department of Education. These include teacher preparation programs in the areas of Pre-Kindergarten - Grade 4 (PK-4); Middle Level (Grades 4 - 8) in English, Mathematics and Science; the Secondary Level (Grades 7-12) in areas of Biology, Chemistry, Earth & Space Science, English, General Science, Mathematics, Physics, and Social Studies; and Special Education (both Grades PK - 8 and 7 - 12). State-approved, school leadership certification areas include School Principal K-12, School Superintendent K-12, Special Education Supervisory and Instructional Technology Specialist. Other state-approved programs and program endorsements are provided in the areas of Autism, Reading Specialist, STEM Teaching Endorsement, and Teaching English as a Second Language Program.
- The School of Education will be seeking accreditation from the Council for the Accreditation of Educator Preparation

The Thomas R. Kline School of Law

- The Thomas R. Kline School of Law is accredited by ABA (American Bar Association).
- The Master of Legal Studies (MLS) is accredited by the Compliance Certification Board (CCB)[®].

Any student or prospective student may request a copy of the documents describing the institution's accreditation. This information is available in the Provost's Office and in the Financial Aid Office, both located in the Main Building.

Undergraduate

Tuition/Fees

Undergraduate

- Drexel Central: (http://drexel.edu/drexelcentral/finaid/costs/) Full-Time Undergraduate Tuition, Student Financial Aid and Registration information
- Part-time undergraduate admissions (http://drexel.edu/part-time/) (Saturday Scholars, and non-enrolling students)
- Drexel University Online (http://online.drexel.edu/financing/tuition.aspx)

Graduate

- Drexel Central: (http://drexel.edu/drexelcentral/finaid/costs/grad/) Graduate Program Tuition, Fees and Expenses
- Drexel Central: (http://drexel.edu/drexelcentral/finaid/costs/medicine/) College of Medicine Tuition, Fees and Expenses
- Drexel Central: (http://drexel.edu/drexelcentral/finaid/costs/law/) School of Law Tuition, Fees, and Expenses

The Steinbright Career Development Center

The Steinbright Career Development Center (Steinbright) (http://www.drexel.edu/scdc/) serves all students and recent alumni through cooperative education and career services offerings. For information about potential co-op experiences, or to access career guides for specific majors, visit the Steinbright Center's Co-op Career Guide (http://www.drexel.edu/scdc/career-services/counseling/career-guides/) page.

I. Drexel Undergraduate Co-op

Cooperative Education at Drexel (http://www.drexel.edu/scdc/coop/) enables full-time undergraduate students to alternate periods of classroom theory with professional experience prior to graduation. Participation in co-op is available in most academic programs. Successful completion of the cooperative education experience is a graduation requirement for students enrolled in a co-op degree program. Students have the opportunity to gain 6 to 18 months of career-related work experience integrated with their coursework. Cooperative education helps students explore and confirm their career choices by assisting students in several areas of career development, including self-assessment and career exploration. Through co-op students develop confidence, professionalism and a sense of purpose. Students are expected to take advantage of every possible opportunity to observe different aspects of the workplace and to gain experience.

To learn more about undergraduate co-op, visit the Steinbright Career Development Center's website (https://drexel.edu/scdc/co-op/undergraduate/).

A. Co-op Program Schedule Options **(**http://www.drexel.edu/scdc/co-op/undergraduate**/)**

B. **Co-op Policies and Procedures**

C. Co-op Preparatory Courses **(**https://drexel.edu/scdc/co-op/co-op-curriculum**/)**

D. Classes During Co-op Go to the Provost's website **(**https://drexel.edu/provost/policies/registering-for-classes-during-co-op**/)**

II. Drexel Graduate Co-op Program (GCP)

Drexel's nearly 100-year tradition in the field of experiential education is also available in select graduate programs. Graduate co-op enables master's level students to alternate class terms with one six-month period of professional or research experience.

For more information about the graduate co-op program and a list of participating majors visit the Graduate Co-op website (https://drexel.edu/scdc/co-op/graduate/).

III. Career Services

Career Services (http://drexel.edu/scdc/career-services/exploring/) offers assistance to all current students and alumni in securing employment consistent with personal career goals and objectives. All services are free of charge to active students and alumni. Services, resources, and events include:

- Individual career counseling, including assessments designed to help individuals choose long-range career goals consistent with their abilities, education, interests, values and personality.

- Career counselors who work specifically with first year students and graduating seniors. Individual appointments and group programs covering topics including resume writing, interview preparation, job search strategies and offer negotiation.

- On-Campus Interview Program which provides opportunities for on-campus interviews with employers from business, industry, education, and government services.

- Handshake. Drexel's online job search system. Students can review job postings with employers who are interested in hiring Drexel students and alumni. Students can also research companies, information on career fairs, and company-hosted information sessions with Handshake (https://drexel.edu/scdc/career-services/searching-for-job/handshake/).

- Comprehensive pre-professional advising services to students and alumni who are considering careers in law or medicine.

- Two of the largest career fairs in the Delaware Valley in October and April open to all students and alumni. In addition, a career fair specifically for engineering and technology students is held in the winter term.

The Close School of Entrepreneurship

In today's extremely competitive global workforce, there is an increased value and demand for initiative, independence, innovation, and the intellectual dexterity to rethink the old ways of doing things and invent new ones. The Charles D. Close School of Entrepreneurship has pioneered an approach to entrepreneurship education that addresses this need by teaching students to be entrepreneurial thinkers and doers, preparing them to meet the world market on solid footing and to create their own opportunities.

The Close School defines entrepreneurship as more than starting a company or sparking innovation within established organizations. At the Close School, entrepreneurship is a habit of mind and an attitude; a skill set applicable to pursuing innovation in both personal and career contexts. We cultivate a student's approach to life built around innovative thinking, calculated daring, and proactive behavior.

Within our unique curriculum, students learn skills such as resilience, collaboration, negotiation, and communication. The Close School's academic and co-curricular programs prepare students for the ever-evolving 21st-century workforce, which will include experiences in new-venture creation, self-employment, corporate innovation, and the development of impactful social enterprises.

Majors

- Entrepreneurship and Innovation (BA) (p. 18)
- *NEW:* Entrepreneurship & Innovation 3-year Option (BA)

Minors

- Corporate Entrepreneurship (p. 23)
- Entrepreneurship and Innovation (p. 23)
- Social Entrepreneurship (p. 23)

Certificate

- *NEW:* Entrepreneurship (p. 23)

Background

In December 2012, the Charles and Barbara Close Foundation's gift of $12.5 million established the Charles D. Close School of Entrepreneurship. In January 2013, the Charles D. Close School of Entrepreneurship became the first degree-granting school of entrepreneurship, independent of a business school, in the nation. The Close School is founded on the principle that every student should have the opportunity to dream big and pursue their passions. We encourage, educate, and enable innovation and entrepreneurship.

Why is learning about entrepreneurship important to your career? There are several significant reasons. First, entrepreneurial skills will protect you in a weak job market by giving you the tools to create your own jobs. Second, learning about entrepreneurship broadens your perspective about ways to pursue your career entrepreneurially, rather than on traditional pathways in particular fields. Third, today, more than ever, companies seek employees with some type of entrepreneurial experience. Leading companies of all sizes understand that they must **innovate** to survive and prosper. Students who have developed an entrepreneurial mindset have strong communication skills, recognize how to take initiative, and know how to execute. By hiring entrepreneurial individuals, these companies are bringing innovative perspectives into the workplace.

Entrepreneurship is much more than the process of starting a company. Entrepreneurship is a habit of mind and an attitude; a skill set applicable to pursuing innovation in business, personal, and career contexts and an approach to life built around innovative thinking, calculated daring, and proactive behavior. Our goal is to infuse **entrepreneurial thinking and doing** in our courses and related programs.

Our courses and programs are designed to be experiential and interdisciplinary. They are available to all students throughout the University, regardless of major. We offer a fully funded Entrepreneurship Co-op and courses that provide small amounts of seed funding for new student businesses. Through our Baiada Institute for Entrepreneurship, an array of programs and business competitions enhance your entrepreneurial experience.

At the Close School of Entrepreneurship, we believe that **all** students have the potential to be innovative; to take their ideas, in whatever context, and make them a reality. To elicit the entrepreneur in you, we offer students who are interested in learning about the process of innovation and entrepreneurship various curricular and co-curricular paths to becoming an "entrepreneur."

Goals and Objectives

- Present entrepreneurship as a way to think, learn, and succeed in terms of values, behaviors, and process.
- Provide a cutting-edge approach to entrepreneurship education.
- Complement and enhance undergraduate and graduate education outcomes for students by developing entrepreneurial thinking within the curriculum.
- Encourage and create a supportive academic and physical environment to allow the pursuit of student passions and big ideas.
- Provide students, upon graduation with three competencies:

  1. The entrepreneurial mindset.
  2. An entrepreneurship toolkit.
  3. Expertise in a specific content area of their choosing.

School Offerings

The Close School of Entrepreneurship offers students various paths to becoming an "entrepreneur." The School is based on the premise that all students have the potential to be innovative: to take their ideas, in whatever context, and make their ideas a reality. The curricular and co-curricular programs are formulated to accommodate students' potential paths to learning and living entrepreneurship.

Academic Programs

The School offers a BA and an MS in Entrepreneurship and Innovation, undergraduate minors in Corporate Entrepreneurship, Entrepreneurship and Innovation, and Social Entrepreneurship, and a graduate minor in Entrepreneurship and Innovation. In addition, the Close School offers to all Drexel students, many elective courses with minimal or

no prerequisites that integrate entrepreneurial education with all other academic disciplines at the University.

Through the appointment of a core of excellent teaching faculty (serial entrepreneurs and seasoned executives) and tenured/tenure-track faculty, the Close School cultivates a research agenda, providing thought leadership to academics and practitioners. Finally, the Close School of Entrepreneurship collaborates with regional and national organizations and the entrepreneurial community to advance innovation and entrepreneurial initiatives.

Entrepreneurship Co-Op

The co-op experience is the hallmark of a Drexel education. Drexel students intersperse one or three six-month periods of work within their academic plans of study. By weaving together scholarly and practical experiences, Drexel students graduate with a unique set of skills that open up a diverse array of professional opportunities upon graduation.

The Close School recognizes that many undergraduates have already started their own companies. To encourage this entrepreneurial spirit within our student body, the Close School, in collaboration with the Steinbright Career Development Center, offers to all Drexel undergraduate students the opportunity to use their own company as their co-op experience. Students who qualify for this opportunity receive a salary ($15,000), like other co-op students who work for established companies and organizations. Most importantly, students participating in the entrepreneurship co-op receive weekly mentoring from Close School faculty.

The Baiada Institute for Entrepreneurship

The Baiada Institute is the cradle of entrepreneurship at Drexel University. Open to all students at Drexel, Baiada provides student entrepreneurs the physical space, mentoring, and resources to start their first (or next) big thing. The Baiada Institute translates the Close School of Entrepreneurship (http://www.drexel.edu/close/)'s groundbreaking curriculum (http://www.drexel.edu/close/academics/courses/) into disruptive ideas led by innovative companies, created by Drexel students from all academic disciplines.

Entrepreneurship and Innovation

Major: Entrepreneurship and Innovation
Degree Awarded: Bachelor of Arts Degree (BA)
Calendar Type: Quarter
Total Credit Hours: 181.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 52.0701
Standard Occupational Classification (SOC) code: 11-1011; 11-1021; 11-9199

About the Program

The BA in Entrepreneurship and Innovation is designed to prepare students to think and act entrepreneurially, in the context of established companies, in working for small and growing ventures, in starting a new venture or self-employment, and in their overall approach to their personal and professional lives. Within this innovative curriculum, students build entrepreneurial skills such as resilience, opportunity recognition, self-efficacy, negotiation, and effective communication.

The program emphasizes interdisciplinary coursework in collaboration with other Drexel colleges and schools, providing entrepreneurship students with the opportunity to take classes with future engineers, scientists, artists, and business and community leaders.

For additional information about the BA in Entrepreneurship and Innovation, please contact Rita Berson at rk25@drexel.edu.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Required Courses:

- Entrepreneurial Mindset: This is a suite of courses that addresses individual entrepreneurial skills such as resiliency, initiative, innovative thinking, and communication. These courses develop personal and interpersonal skills needed to be a successful "entrepreneur" in several contexts.

- The Process of Entrepreneurship: This set of required courses covers a broad range of topics that immerse students in the practice of entrepreneurship.

- A choice of three concentration areas: Social Entrepreneurship, Corporate Entrepreneurship, and New Venture Creation.

- Electives: Constitutes a group of courses from the Close School and across the University that reflect the themes of innovation and entrepreneurship.

- Minors: All entrepreneurship majors are required to select an academic minor, which will provide domain expertise in their area of interest. Students may select from over 150 minors offered by the University.

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COM 230	Techniques of Speaking	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 105	Critical Reasoning	3.0
UNIV C101	The Drexel Experience	1.0
Two Mathematics Courses (MATH)		**6.0-8.0**
Two Science Courses		**6.0-8.0**
	Choose from Bioscience and Biotechnology (BIO), Chemistry (CHEM), Food Science (FDSC), Geoscience (GEO), Physics (PHYS), Physics-Environmental Science (PHEV)	
Social/Behavioral Science		**6.0**
	Choose 2 courses from Anthropology (ANTH), Communications (COM), Economics (ECON), History (HIST), Political Science (PSCI), Psychology (PSY), Sociology (SOC)	
ECON 201	Principles of Microeconomics	4.0
Choose one of the following writing intensive courses:		3.0
COM 270 [WI]	Business Communication	
COM 310 [WI]	Technical Communication	

COM 317 [WI]	Environmental Communication	
COM 320 [WI]	Science Writing	
COM 375 [WI]	Grant Writing	
ECON 326 [WI]	Economic Ideas	
PSY 240 [WI]	Abnormal Psychology	
PSY 245 [WI]	Sports Psychology	
PSY 250 [WI]	Industrial Psychology	
Three Humanities/Fine Arts Courses		**9.0**
Choose from Africana Studies (AFAS), English (ENGL), Humanities-General (HUM), Global Studies (GST), Judaic Studies (JUDA), Philosophy (PHIL), Women's & Gender Studies (WGST); Any course from the Westphal College of Media Arts and Design		
Two Technology Courses		**6.0**
Choose from Computer Science (CS), Information Science & Systems (INFO), Management Information Systems (MIS), Software Engineering (SE)		
Two Ethics Courses		**6.0**
Select two of the following:		
PHIL 251	Ethics	
PHIL 301	Business Ethics	
PHIL 305	Ethics and the Media	
PHIL 311	Ethics and Information Technology	
PHIL 315	Engineering Ethics	
PHIL 321	Biomedical Ethics	
PHIL 323	Organizational Ethics	
PHIL 335	Global Ethical Issues	
Three Language Courses (Foreign Language or Computer Science) [*]		9.0-12.0
Arabic (ARBC), Chinese (CHIN), French (FREN), German (GER), Hebrew (HBRW), Italian (ITAL), Japanese (JAPN), Korean (KOR), Russian (RUSS), Spanish (SPAN) OR one of the following CS Language sequences:		
CS 143	Computer Programming Fundamentals	
CS 150	Computer Science Principles	
CS 171	Computer Programming I	
OR		
CS 150	Computer Science Principles	
CS 171	Computer Programming I	
CS 172	Computer Programming II	
Entrepreneurship Requirements		
ACCT 120	Accounting Essentials for New Ventures	4.0
BLAW 346	Entrepreneurial Law	4.0
ENTP 100	Innovation Ecosystem	1.0
ENTP 101	Life Strategies I	3.0
ENTP 105	Entrepreneurship Practice & Mindset	3.0
ENTP 205	Ready, Set, Fail	3.0
ENTP 215	Building Entrepreneurial Teams	3.0
ENTP 225 [WI]	Mindfulness & Wellbeing ([WI])	3.0
ENTP 250	Ideation	3.0
ENTP 410 [WI]	Thought Leadership	3.0
MKTG 201	Introduction to Marketing Management	4.0
Concentration Requirements		**12.0**
Select a concentration from the following options:		
Social Entrepreneurship		
ENTP 270	Social Entrepreneurship	
ENTP 275	Diversity Entrepreneurship	
ENTP 290	An Entrepreneur's Introduction to Land: Its Essence, Ethics, and Opportunity	
or ENTP 390	Energy Entrepreneurship	
ENTP 375	3BL - Triple Bottom Line	
Corporate Entrepreneurship		
ENTP 285	Organizational Innovation and Change for Corporate Entrepreneurs	
ENTP 329	Entrepreneurship & New Technologies	
or MKTG 347	New Product Development	

ENTP 340	Managing Entrepreneurial Growth	
ENTP 385	Innovation in Established Companies	
New Venture Creation		
ENTP 210 [WI]	Leading Start-Ups	
ENTP 325	Early Stage Venture Funding	
ENTP 450	Launch It!	
MKTG 364	Marketing for New Ventures	
Entrepreneurship Electives [**]		**15.0**
Select five of the following:		
CRTV 303	Creativity in the Workplace	
DIGM 223	Creative Concept Design	
DSMR 231	Retail Operations	
ECON 202	Principles of Macroeconomics	
ENTP 102	Life Strategies II	
ENTP 350	Dynamics of the Family Firm	
ENTP 360	Franchising	
ENTP 370	Global Entrepreneurship	
ENTP 440	Launch It!: Early Stage	
ENTP T180	Special Topics in Entrepreneurship	
ENTP T280	Special Topics in Entrepreneurship	
ENTP T380	Special Topics in Entrepreneurship	
ENTP T480	Special Topics in Entrepreneurship	
MIS 200	Management Information Systems	
RETL 315	Power of Retail Brands	
Required Academic Minor[***]		**24.0**
Free Electives		**24.0**
Total Credits		181.0-188.0

[*] A computer science course cannot satisfy both a technology requirement and a computer language requirement.

[**] BA students may also take any ENTP course not in their chosen concentration to meet the entrepreneurship elective requirement.

[***] BA students are required to complete an academic minor offered by any other Drexel College or School.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms

before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENTP 100	Innovation Ecosystem	1.0
ENTP 105	Entrepreneurship Practice & Mindset	3.0
ENTP 250	Ideation	3.0
UNIV C101	The Drexel Experience	1.0
Mathematics Course		3.0-4.0
	Term Credits	14.0-15.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
ENTP 101	Life Strategies I	3.0
ENTP 205	Ready, Set, Fail	3.0
Foreign or Computer Language		3.0-4.0
Math Course		3.0-4.0
	Term Credits	16.0-18.0
Term 3		
ACCT 120	Accounting Essentials for New Ventures	4.0
COOP 101	Career Management and Professional Development	0.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
ENTP 215	Building Entrepreneurial Teams	3.0
Foreign or Computer Language		3.0-4.0
Social or Behavioral Science Course		3.0
	Term Credits	16.0-17.0
Term 4		
ECON 201	Principles of Microeconomics	4.0
ENTP 225 [WI]	Mindfulness & Wellbeing (WI)	3.0
Foreign or Computer Language		3.0-4.0
Free Elective		3.0
Science Course		3.0-4.0
	Term Credits	16.0-18.0
Term 5		
COM 230	Techniques of Speaking	3.0
PHIL 105	Critical Reasoning	3.0
ENTP Elective Course		3.0
Required Minor Course		3.0
Science Course		3.0-4.0
	Term Credits	15.0-16.0
Term 6		
MKTG 201	Introduction to Marketing Management	4.0
Concentration Course		3.0
Fine Arts/Humanities course		3.0
Required Minor Course		3.0
Technology Course		3.0
	Term Credits	16.0
Term 7		
Concentration Course		3.0
Ethics Course		3.0
Required Minor Course		3.0
Social/Behavioral Science Course		3.0
Technology Course		3.0
	Term Credits	15.0
Term 8		
BLAW 346	Entrepreneurial Law	4.0
ENTP Elective Course		3.0

Fine Arts/Humanities Course		3.0
Non-major Writing-Intensive Course [WI]		3.0
Required Minor Course		3.0
	Term Credits	16.0
Term 9		
Concentration Requirement		3.0
ENTP Elective Course		3.0
Fine Arts/Humanities Course		3.0
Free Elective		3.0
Required Minor Course		3.0
	Term Credits	15.0
Term 10		
ENTP 410 [WI]	Thought Leadership (WI)	3.0
Concentration Requirement		3.0
Ethics Course		3.0
Required Minor Course		3.0
	Term Credits	12.0
Term 11		
ENTP Elective Course		3.0
Required Minor Course		3.0
Free Electives		9.0
	Term Credits	15.0
Term 12		
ENTP Elective Course		3.0
Free electives		9.0
Required Minor Course		3.0
	Term Credits	15.0

Total Credit: 181.0-188.0

Entrepreneurship and Innovation Faculty

Nick Bayer, BS *(Cornell University)*. Adjunct Instructor.

Roy Carriker, PhD *(University of Connecticut)*. Teaching Professor.

Donna De Carolis, PhD *(Temple University) Dean Silverman Family Professor Entrepreneurial Leadership*.

Michael Kurzeja, MBA *(Grantham University)*. Adjunct Instructor.

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Zahed Subhan, PhD, JD/LLB (Law) *(University of Leeds (UK); London University)*. Teaching Professor.

Entrepreneurship & Innovation 3-year Option

Major: Entrepreneurship and Innovation
Degree Awarded: Bachelor of Arts Degree (BA)
Calendar Type: Quarter
Total Credit Hours: 181.0
Co-op Options: None
Classification of Instructional Programs (CIP) code: 52.0701
Standard Occupational Classification (SOC) code: 11-1011

About the Program

The three-year BA in Entrepreneurship and Innovation program is a unique, accelerated plan of study that teaches entrepreneurship as a habit-of-mind that applies to both the student's career and life. Entrepreneurship is about being proactive, opportunistic, and innovative. The three-year degree in entrepreneurship & innovation offered by the Close School is rigorous and sustains all the standards of our four- or five-year degree programs. It is a degree that is particularly appealing to the student who is determined, disciplined, and goal-oriented – as we find that many entrepreneurship students are.

Our holistic approach to teaching challenges students to think and act as an entrepreneur within companies, startups, or self-employment. We have developed a curriculum that teaches resilience, collaboration, negotiation, and communication. Students will learn how to manage growth, secure funding, or manage a family firm. We stress interdisciplinary work and flexibility with all Drexel schools through the required academic minor and offer three-year students advanced experiential learning in our exclusive Entrepreneurship Practicum.

Degree Requirements

General Education Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COM 230	Techniques of Speaking	3.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 105	Critical Reasoning	3.0
UNIV C101	The Drexel Experience	1.0
Math Requirements (2 courses)		6.0-8.0
Science Requirements (2 courses)		6.0-8.0
Social/Behavioral Science Requirements (2 courses)		6.0
Humanities/Fine Arts Requirements (2 course)		6.0
Technology Requirement (1 course)		3.0
Language Requirements (3 courses)		9.0-12.0
Writing-Intensive (non-major) (1 course)		3.0
Ethics Requirements - Select two of the following:		6.0
PHIL 251	Ethics	
PHIL 301	Business Ethics	
PHIL 305	Ethics and the Media	
PHIL 311	Ethics and Information Technology	
PHIL 315	Engineering Ethics	
PHIL 321	Biomedical Ethics	
PHIL 323	Organizational Ethics	
PHIL 335	Global Ethical Issues	
ENTP Core Requirements		
ACCT 120	Accounting Essentials for New Ventures	4.0
BLAW 346	Entrepreneurial Law	4.0
ENTP 100	Innovation Ecosystem	1.0
ENTP 101	Life Strategies I	3.0
ENTP 105	Entrepreneurship Practice & Mindset	3.0
ENTP 205	Ready, Set, Fail	3.0
ENTP 215	Building Entrepreneurial Teams	3.0
ENTP 225 [WI]	Mindfulness & Wellbeing	3.0
ENTP 250	Ideation	3.0
ENTP 410 [WI]	Thought Leadership	3.0
MKTG 201	Introduction to Marketing Management	4.0
ENTP 395	Entrepreneurship Practicum	12.0
ENTP Electives - Select 7 of the following:		21.0
DSMR 231	Retail Operations	
DIGM 223	Creative Concept Design	
ENTP 102	Life Strategies II	
ENTP 210 [WI]	Leading Start-Ups	
ENTP 270	Social Entrepreneurship	
ENTP 275	Diversity Entrepreneurship	
ENTP 285	Organizational Innovation and Change for Corporate Entrepreneurs	
ENTP 325	Early Stage Venture Funding	
ENTP 329	Entrepreneurship & New Technologies	
ENTP 340	Managing Entrepreneurial Growth	
ENTP 350	Dynamics of the Family Firm	
ENTP 360	Franchising	
ENTP 370	Global Entrepreneurship	
ENTP 375	3BL - Triple Bottom Line	
ENTP 385	Innovation in Established Companies	
ENTP 390	Energy Entrepreneurship	
ENTP 450	Launch It!	
ENTP T180	Special Topics in Entrepreneurship	
ENTP T280	Special Topics in Entrepreneurship	
ENTP T380	Special Topics in Entrepreneurship	
ENTP T480	Special Topics in Entrepreneurship	
MKTG 347	New Product Development	
PROD 210	Introduction to Product Design	
Required Specialization Minor		24.0
Free electives		24.0
Total Credits		181.0-188.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/

english-philosophy/university-writing-program/drexel-writing-center/)
Students scheduling their courses can also conduct a search for courses
with the attribute "WI" to bring up a list of all writing-intensive courses
available that term.

Sample Plan of Study

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENTP 100	Innovation Ecosystem	1.0
ENTP 105	Entrepreneurship Practice & Mindset	3.0
ENTP 250	Ideation	3.0
UNIV C101	The Drexel Experience	1.0
Mathematics course		3.0-4.0
	Term Credits	14.0-15.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENTP 101	Life Strategies I	3.0
ENTP 205	Ready, Set, Fail	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
Mathematics course		3.0-4.0
Language course		3.0-4.0
	Term Credits	16.0-18.0
Term 3		
ACCT 120	Accounting Essentials for New Ventures	4.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
ENTP 215	Building Entrepreneurial Teams	3.0
Language course		3.0-4.0
Social/Behavioral Science course		3.0
	Term Credits	16.0-17.0
Term 4		
ECON 201	Principles of Microeconomics	4.0
Free elective		3.0
Language course		3.0-4.0
Required Minor course		3.0
Science course		3.0-4.0
	Term Credits	16.0-18.0
Term 5		
COM 230	Techniques of Speaking	3.0
ENTP 225 [WI]	Mindfulness & Wellbeing	3.0
PHIL 105	Critical Reasoning	3.0
Entrepreneurship elective		3.0
Science course		3.0-4.0
Required Minor course		3.0
	Term Credits	18.0-19.0
Term 6		
MKTG 201	Introduction to Marketing Management	4.0
Entrepreneurship elective		3.0
Fine Arts/Humanities elective		3.0
Free electives		6.0
Required Minor course		3.0
	Term Credits	19.0
Term 7		
Entrepreneurship elective		3.0
Ethics course		3.0
Required Minor course		3.0
Non-major Writing-intensive [WI] course		3.0
Social/Behavioral Science course		3.0
Technology course		3.0
	Term Credits	18.0
Term 8		
ENTP 395	Entrepreneurship Practicum	12.0
	Term Credits	12.0
Term 9		
BLAW 346	Entrepreneurial Law	4.0
ENTP 410 [WI]	Thought Leadership	3.0
Entrepreneurship elective		3.0
Free elective		3.0
Required Minor course		3.0
	Term Credits	16.0
Term 10		
Entrepreneurship elective		3.0
Ethics course		3.0
Fine Arts/Humanities Elective		3.0
Free electives		6.0
Required Minor course		3.0
	Term Credits	18.0
Term 11		
Entrepreneurship electives		6.0
Required Minor courses		6.0
Free electives		6.0
	Term Credits	18.0

Total Credit: 181.0-188.0

Entrepreneurship and Innovation Faculty

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Roy Carriker, PhD *(University of Connecticut)*. Teaching Professor.

Donna De Carolis, PhD *(Temple University) Dean Silverman Family Professor Entrepreneurial Leadership*.

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Damian Salas, MBA *(Drexel University) Assistant Dean of Entrepreneurship Programs*. Assistant Teaching Professor.

Zahed Subhan, PhD, JD/LLB (Law) *(University of Leeds (UK); London University)*. Teaching Professor.

Minor in Corporate Entrepreneurship

About the Minor

The minor in Corporate Entrepreneurship is designed for students who are interested in careers that spark innovation within start-up companies or established organizations. At the Close School, entrepreneurship is a habit of mind and an attitude; a skill set applicable to pursuing innovation in both personal and career contexts. Students who minor in Corporate Entrepreneurship will learn to cultivate the entrepreneurial mindset, which builds innovative thinking, calculated daring, and proactive behavior that can be applied to their personal and professional lives.

Admission Requirements

Students of any major with more than 40.0 credits may declare a minor in Corporate Entrepreneurship.

Program Requirements

ENTP 101	Life Strategies I	3.0
ENTP 205	Ready, Set, Fail	3.0
ENTP 250	Ideation	3.0
ENTP 285	Organizational Innovation and Change for Corporate Entrepreneurs	3.0
ENTP 329	Entrepreneurship & New Technologies	3.0
ENTP 340	Managing Entrepreneurial Growth	3.0
ENTP 385	Innovation in Established Companies	3.0
ENTP 440	Launch It!: Early Stage	3.0
Total Credits		24.0

Minor in Entrepreneurship and Innovation

About the Minor

The minor in entrepreneurship and innovation is designed for students who are interested in starting their own ventures, working for start-up companies, or preparing for self-employment. Students who minor in entrepreneurship and innovation will learn to adopt the entrepreneurial mindset and apply it to their personal and professional lives.

For additional information about the entrepreneurship minor, please contact Rita Berson at rk25@drexel.edu.

Required Courses		
ENTP 101	Life Strategies I	3.0
ENTP 205	Ready, Set, Fail	3.0
ENTP 210 [WI]	Leading Start-Ups	3.0
ENTP 215	Building Entrepreneurial Teams	3.0
ENTP 250	Ideation	3.0
ENTP 325	Early Stage Venture Funding	3.0
ENTP 440	Launch It!: Early Stage	3.0
MKTG 201	Introduction to Marketing Management	4.0
Total Credits		25.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Social Entrepreneurship

About the Minor

The Social Entrepreneurship minor is designed for students interested in learning how to create and sustain social value within companies or through the pursuit of any social enterprise. Students will learn to develop, fund, and implement innovative solutions to social, cultural, or environmental issues.

ENTP 101	Life Strategies I	3.0
ENTP 205	Ready, Set, Fail	3.0
ENTP 250	Ideation	3.0
ENTP 270	Social Entrepreneurship	3.0
ENTP 275	Diversity Entrepreneurship	3.0
ENTP 290	An Entrepreneur's Introduction to Land: Its Essence, Ethics, and Opportunity	3.0
or ENTP 390	Energy Entrepreneurship	
ENTP 375	3BL - Triple Bottom Line	3.0
ENTP 440	Launch It!: Early Stage	3.0
Total Credits		24.0

Additional Information

For additional information about the Social Entrepreneurship minor, please contact Rita Berson at rk25@drexel.edu.

Certificate in Entrepreneurship

Only available to currently enrolled Drexel students.

The Certificate in Entrepreneurship is for students who would like to expand the scope of their undergraduate Drexel degree by also developing an entrepreneurial mindset and skillset. This certificate will help you learn to evaluate and pursue opportunities and, most importantly, realize your passions by either starting a company, being innovative in an organization, or navigating your career. By building your entrepreneurial skills and helping you assemble the tools that you need to succeed, the Certificate in Entrepreneurship equips you to achieve your life and career aspirations in an ever-changing employment landscape.

Open to Drexel students from all schools and colleges, in all majors (with the exception of Close School majors), who have completed 15 credits.

Required courses		
ENTP 105	Entrepreneurship Practice & Mindset	3.0

ENTP 205	Ready, Set, Fail	3.0
ENTP 440	Launch It!: Early Stage [*]	3.0
Choose two courses from the following:		6.0
ENTP 101	Life Strategies I	
ENTP 215	Building Entrepreneurial Teams	
ENTP 250	Ideation	
ENTP 270	Social Entrepreneurship	
Total Credits		15.0

[*] Taken as a final course in certificate program after completion of all other course requirements.

The College of Arts and Sciences

About the College

Mission Statement

By pursuing excellence in research and scholarship, we educate our students to become ethical professionals and citizens with knowledge of and appreciation for the fundamental interactions among the humanities, social sciences and the sciences in a fast-changing, challenging, and diverse world.

About the College of Arts and Sciences

Drexel University's College of Arts and Sciences (http://www.drexel.edu/coas/) (CoAS) stands unafraid in the face of change. We recognize that our ever-evolving, fast-paced culture required a new approach to education, one that understands the world is malleable and can be molded by minds inspired to lead society's evolution.

But innovation requires more than an ambitious personality. It requires versatility -- we must not only be experts in our field, but also agile enough to engage in the cross-disciplinary work needed to address modern problems resourcefully. That's why our faculty challenge students to see past their own perspectives and establish a deeper understanding of humanity's needs. It's why our co-op program inserts students within a professional culture, introducing them to the expectations of the job while offering hands-on practical application of coursework. And it's why, starting as early as early as freshman year, students team with faculty members as peers, conducting research that affects the world now.

Here at CoAS, we are committed to implementing in-the-moment change, not for personal glory, but because it's what the world needs.

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- Chemistry-Biochemistry Concentration (BS) (p. 43)
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  - Communication Concentration (p. 49)
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- Communication (BS) (p. 55)
  - *NEW:* Communication Concentration
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- *NEW:* Philosophy, Politics & Economics (BA)

- Physics (BS) (p. 109)
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- **NEW:** History of Capitalism
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- **NEW:** Medical Sociology
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Special Programs

Emerging Scholars Program

This two-year program is designed for students interested in the humanities and social sciences who want to experience the range of opportunities in these disciplines before choosing a major. The program provides mentorship, specialized seminars, and co-curricular events, as well as a co-op position in the community to guide students toward defining their scholarly and career interests. The Emerging Scholars Program does not grant a degree, but helps guide students in choosing a major that's right for them.

Learn more on the College of Arts and Sciences (http://drexel.edu/coas/academics/undergraduate-programs/emerging-scholars-program/) website.

Pre-professional Programs

Students wishing to prepare for admission to professional schools of medicine, veterinary medicine, dentistry, or public health may obtain pre-professional counseling and application assistance at the Steinbright Career Development Center. (http://drexel.edu/scdc/) For health profession application assistance, students may call 215.895.2437. For law school admission assistance, students may call 215.895.1632

Accelerated Programs

The College of Arts and Sciences offers several accelerated degree programs that enable academically qualified students to earn both a bachelor's and an advanced degree concurrently, graduating sooner than they would in traditional programs. Depending on the academic program,

eligible students can be admitted to an accelerated degree program in one of two ways: as an incoming freshman or after completing a minimum of 90.0 credits but no more than 120.0 credits. Note: In addition to the options listed below, student can apply to combine degree programs into an accelerated BS/MS program. Talk to your academic advisor to learn more.

More details about Accelerated Programs can be found on the Undergraduate Admissions (http://drexel.edu/coas/admissions/overview/) website.

DragonsTeach

DragonsTeach is a collaboration between the College of Engineering, the College of Arts and Sciences, and the School of Education designed to allow students in science, technology, engineering, and math (STEM) degree programs to explore a career in education. Through a unique combination of skills development and classroom experiences, DragonsTeach students can earn a minor in STEM Education and eligibility for teaching credentials while completing their major degree program and co-ops. Learn more on the DragonsTeach website (http://drexel.edu/dragonsteach/).

Eligible Majors:

- BS in Biology
- BS or BA in Chemistry
- BS in Environmental Science
- BS or BA in Mathematics
- BS in Physics

Secondary and Elementary Teacher Certification

The School of Education offers innovative curricula that combines academic majors with appropriate coursework to satisfy state requirements for certification in elementary education. Students interested in the teacher education programs should contact the School of Education (http://drexel.edu/soe/).

The Drexel Writing Center

The Drexel Writing Center (DWC) is dedicated to helping students, faculty, and staff, at all levels of experience and across all disciplines, in their development as writers.

- The DWC works with writers at all stages in the writing process, from brainstorming ideas to polishing final drafts.
- The DWC focus is on individual, one-on-one sessions that feature a conversational, collaborative relationship between the reader and the writer they work with.
- Interaction with the DWC will help writers develop not just writing but critical thinking and reading skills.
- While DWC readers do not perform copy-editing services, they will help students learn strategies for proofreading and editing their documents.

The DWC is located at 0032 MacAlister Hall and can be reached at 215.895.6633. Further information can be found at the Drexel Writing Center (http://drexel.edu/writingcenter/) website.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

English Language Center

As part of the College of Arts and Sciences, Drexel's English Language Center (http://www.drexel.edu/elc/) offers an accredited intensive English program throughout the year. In addition to classes in academic skills such as essay writing and oral presentations, the Center offers the Language of STEM (Science Technology Engineering and Math), Language of Media and Design, Global Business English program (GLOBE), English for academic purposes, TOEFL and iELTS preparation, ESL Teaching enhancement programs, and other subjects.

Through the International Gateway program, the English Language Center offers academic language preparation for students who have an admissible high school academic background but need further English language proficiency. This pathway program combines academic English language courses, credit courses taught by CoAS faculty, and acculturation activities. Students admitted into the University Preparation program (UPREP) begin their studies at Drexel in the English Language Center in a short, pre-term program designed to prepare international students for the academic work and culture of the American university.

Accepted undergraduate students have access to free language tutoring and other academic skills workshops throughout the academic year.

For more information, see the ELC website or contact the Center at:

English Language Center
229 N. 33rd Street
Philadelphia, PA 19104

Phone: 215-895-2022
Fax: 215-895-6775
E-mail: elc@drexel.edu

The Drexel Co-op

No summers of coffee runs or mindless filing here! Drexel students embark on six-month periods of full-time employment in practical, discipline-specific positions consistent with their interests and abilities. Depending on their chosen program, students have the opportunity to participate in up to three different co-op positions - that's 18 months

of real work experience - during their time at Drexel, allowing them to explore their career options, strengthen their resumes and build a professional network in the process. While co-op opportunities can be both paid and unpaid, students who participate in the co-op program typically receive higher starting salaries post-graduation than graduates of other schools.

The number of co-op experiences required for graduation is determined by the student's chosen course of study. The following options exist for most majors:

- **Three Co-op Option** (Five Years)
- **One Co-op Option** (Four Years)
- **No Co-op Option** (Four Years) *Though this program is available, we strongly encourage students to take advantage of the co-op program, a key benefit of a Drexel education.*

Learn more on the Steinbright Career Development Center (http://drexel.edu/scdc/) website.

Global Opportunities

Global Opportunities Abound

Philadelphia may be the heart of Drexel's campus, but the world is our muse. There are numerous opportunities for Drexel Dragons to go abroad.

Study Abroad

Study abroad allows students a unique academic experience to learn about subjects from an international perspective, often with local students and professors. From Costa Rica to Barcelona, Milan to Turkey, Brazil to Israel, our students have studied all over the world.

Research Abroad

Research extends far beyond the walls of any laboratory. Our students have studied sea turtles in Costa Rica, infectious diseases in Uganda and data from the Double Chooz experiment in France. Many of our faculty members are also involved in international research collaborations and our students have the opportunity to make an impact alongside them.

Co-Op Abroad

Co-op abroad provides students with a unique professional perspective and exposure to an international work environment. Our students have worked at Coca Cola in India, the UN Development Programme in Africa, the Italian Parliament in Rome, and the Heraklion Community Mental Health Center in Greece - just to name a few.

An international co-op gives students a distinct advantage in the global economy, making them more attractive to prospective employers. Candidates with international experience also have the ability to earn higher starting salaries upon graduation.

Visit the Steinbright Career Development Center (http://drexel.edu/scdc/) website to learn more.

Travel Courses

The College of Arts and Sciences' travel-integrated courses allow students to travel domestically or internationally for one or two weeks at the end of a course to extend their studies beyond the classroom. Recent

classes have traveled to France to learn about WWI and Brazil to study commodities exchange. Talk to your academic advisor to learn more.

Alternative Spring Break

The Alternative Spring Break (ASB) program places teams of Drexel students in communities to engage in community service and experiential learning during spring break. Students may choose to work domestically or internationally in activities that benefit the environment, the community and those in need.

Community-Based Learning

In the College of Arts and Sciences' unique Community-Based-Learning (CBL) courses, students don't just study the issues affecting the world, they study alongside the people affected - from prison inmates to hospice patients. CBL courses are offered in three formats:

- Side by side
- Community Hybrid
- Service Learning

Side-by-side courses create a co-learning environment in which Drexel students and the community members take classes together.

Community hybrid courses are composed entirely of Drexel students are split between the classroom and the community.

Service-learning courses require service in the community in addition to students' credit hours in the classroom.

For a current list of available courses, visit the Lindy Center for Civic Engagement (http://drexel.edu/lindycenter/).

Biological Sciences

Major: Biological Sciences
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 182.5
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 26.0101
Standard Occupational Classification (SOC) code: 19-1029

About the Program

The biological sciences major resides in the Department of Biology (http://drexel.edu/coas/academics/departments-centers/biology/). Students earn a bachelor's degree in the biological sciences and are prepared for technical careers in research or commercial laboratories, or for professional schools or graduate study.

The biological sciences encompass many areas of study. Biologists study the structure and functions of living organisms from the individual cell to the full organism, and collectively to the community level. Discoveries in the biological sciences influence many aspects of our daily lives and have become the foundation of many new developments in biotechnology and medicine. In the past two decades, advances in molecular biology, cell biology and genetics have been rapid, opening many new, exciting career opportunities in biotechnology, genetic engineering and the development of new diagnostics and therapeutics. Biologists can pursue a variety of options including careers in medicine, dentistry, veterinary medicine or other health-related areas; in research or commercial laboratories at

pharmaceutical companies, medical research laboratories, biotechnology companies or in government agencies; and in teaching. In fact, more than 100 different occupations have been listed for biologists. Graduates in the biological sciences are in demand and enjoy a high placement rate with competitive salaries.

The curricular choices are designed to provide a sound basis for careers in the private sector, government and research laboratories, and for advanced study in graduate and professional programs in medicine, other health related areas, or in teaching.

The course requirements identifies required support courses in chemistry, physics, mathematics, humanities, and social sciences. With proper selection of electives, students can meet teacher certification requirements or complete a minor in another field. Students are encouraged to consult frequently with their academic advisor for curriculum planning.

In addition to the core requirements, students select one of five concentrations in a field of interest:

- Cell/Molecular Biology/Genetics/Biochemistry
- Organismal Biology/Physiology
- Ecology/Evolution/Genomics
- Pathobiology
- General Biology

Program Options

Co-op employment is an option for biological science students. The major offers three distinct plans:

Five-year option with co-op experience
This option allows for the greatest amount of employment experience, with three distinct six-month periods of employment included with studies. After the start of the sophomore year, students study or work through all terms, including summer.

Four-year option with co-op experience
The degree includes just one six-month period of employment. After the start of sophomore year, students study or work through all terms, including summer.

Four-year option without co-op experience
The degree can be completed in four years without co-op/internship employment. Students are not required to pursue studies during any of the summer terms.

Degree Requirements

The Biological Sciences curriculum is designed to provide students with both depth and flexibility within the field of biology. In addition to the core requirements, students select one of five concentrations in a field of interest.

- Cell/Molecular Biology/Genetics/Biochemistry
- Organismal Biology/Physiology
- Ecology/Evolution/Genomics
- Pathobiology
- General Biology

Concentration requirements and elective options are outlined below. Within each concentration, students are able to further specialize in a focus area by selecting electives in their area of interest.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Requirements

Humanities and Social Sciences

CIVC 101	Introduction to Civic Engagement	1.0
COM 230	Techniques of Speaking	3.0
COM 310 [WI]	Technical Communication	3.0
or COM 320	Science Writing	
COOP 101	Career Management and Professional Development	0.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 251	Ethics	3.0
or PHIL 321	Biomedical Ethics	
UNIV S101	The Drexel Experience	1.0
UNIV S201	Looking Forward: Academics and Careers	1.0
Humanities and Social Science Electives		9.0
Science, Technology, Health and Human Affairs Elective		3.0

Mathematics and Statistics

Select one of the following sequences:		12.0
Intro to Analysis		
MATH 101 & MATH 102 & MATH 239	Introduction to Analysis I and Introduction to Analysis II and Mathematics for the Life Sciences	
Calculus		
MATH 121 & MATH 122 & MATH 123	Calculus I and Calculus II and Calculus III	
MATH 410	Scientific Data Analysis I	3.0
MATH 411	Scientific Data Analysis II	3.0

Physical Sciences

BIO 311	Biochemistry	4.0
or CHEM 243	Organic Chemistry III	
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
CHEM 103	General Chemistry III	5.0
CHEM 241	Organic Chemistry I	4.0
CHEM 242	Organic Chemistry II	4.0
PHYS 152	Introductory Physics I	4.0
PHYS 153	Introductory Physics II	4.0
PHYS 154	Introductory Physics III	4.0

Core Biology Courses

BIO 122	Cells and Genetics	4.5
BIO 124	Evolution & Organismal Diversity	4.5
BIO 126	Physiology and Ecology	4.5
BIO 207	Applications in Biology I	1.0
BIO 208	Applications in Biology II	1.0
BIO 209	Cell, Molecular & Developmental Biology I	4.0
BIO 211	Cell, Molecular & Developmental Biology II	4.0
BIO 219 [WI]	Techniques in Molecular Biology	3.0
BIO 224	Form, Function & Evolution of Vertebrates	4.0
BIO 225	Vertebrate Biology and Evolution Laboratory	2.0

BIO 471	Seminar in Biological Sciences	2.0
BIO 472	Seminar in Biological Sciences	2.0
BIO 473 [WI]	Seminar in Biological Sciences	2.0
ENVS 212	Evolution	4.0
Concentration Courses		**28.0-30.0**
Free electives		24.0
Total Credits		182.5-184.5

Students select one of five concentration and fulfill the requirements, as outlined below.

1. The Cell/Molecular/Genetics/Biochemistry (CMGB) Concentration

This concentration provides exposure to several vital disciplines within Biology, and will prepare students for a diversity of careers in research, medicine, and industry. Students interested in tailoring their studies more specifically may follow the suggested "focus areas" when selecting their two CMGB Concentration electives.

Cell/Molecular/Genetics/Biochemistry (CMGB) Concentration Requirements

BIO 244	Genetics I	3.0
or BIO 444	Human Genetics	
BIO 314	Pharmacology	3.0
or BIO 404	Structure and Function of Biomolecules	
or BIO 416	Biochemistry of Major Diseases	
BIO 318	Biology of Cancer	3.0
or BIO 430	Cell Biology of Disease	
BIO 410	Advanced Molecular Biology	3.0
Cell/Molecular/Genetics/Biochemistry (CMGB) Concentration Electives (See Lists Below)		
Two Cell/Molecular/Genetics/Biochemistry (CMGB) Electives (see list below)		6.0
Organismal/Physiology Elective (see list below)		3.0
Ecology/Evolution/Genomics Elective (see list below)		3.0
Concentration Laboratory Courses		
Two Laboratory Electives (see list below)		4.0
Total Credits		28.0

*   Students interested in pursuing a focus area in Neurobiology, Pharmaceutics, Cell Biology, Biochemistry, Molecular Biology or Genetics should contact the academic advisor in the Biology Department for specific focus recommendations.

Cell/Molecular/Genetics/Biochemistry (CMGB) Electives

BIO 244	Genetics I	3.0
BIO 285	Forensic Biology	3.0
BIO 311	Biochemistry	4.0
BIO 314	Pharmacology	3.0
BIO 318	Biology of Cancer	3.0
BIO 346	Stem Cell Research	3.0
BIO 348	Neuroscience: From Cells to Circuits	3.0
BIO 404	Structure and Function of Biomolecules	4.0
BIO 414	Behavioral Genetics	3.0
BIO 415	Proteins	3.0
BIO 416	Biochemistry of Major Diseases	3.0
BIO 421	Biomembranes	3.0
BIO 430	Cell Biology of Disease	3.0
BIO 433	Advanced Cell Biology	3.0
BIO 444	Human Genetics	3.0
BIO 447	Advanced Genetics and Molecular Biology	3.0
BIO 451	Genetic Reg Development	3.0
BIO 453	Protein Dysfunction in Disease	3.0
BIO 462	Biology of Neuron Function	3.0

BIO 463	Molecular Mechanisms of Neurodegeneration	3.0
BIO 465	Neurobiology of Disease	3.0
ENVS 326	Molecular Ecology	3.0
Organismal/Physiology Electives		
BIO 201	Human Physiology I	4.0
BIO 221	Microbiology	3.0
BIO 256	Vertebrate Morphology and Physiology	3.0
BIO 284	Biology of Stress	3.0
BIO 286	Forensic Toxicology	3.0
BIO 323	Parasitology	3.0
BIO 368	Embryology	4.0
BIO 372	Histology	4.0
BIO 373	Developmental Biology	3.0
BIO 386	Gross Anatomy I	2.0
BIO 412	Biology of Aging	3.0
BIO 420	Virology	3.0
BIO 426	Immunology	3.0
BIO 349	Behavioral Neuroscience	3.0
BIO 461	Neurobiology of Autism Disorders	3.0
ENVS 254	Invertebrate Morphology and Physiology	3.0
ENVS 392	Ichthyology and Herpetology	3.0
ENVS 393	Entomology	3.0
Ecology/Evolution/Genomics Electives		
BIO 228	Evolutionary Biology & Human Health	3.0
BIO 331	Bioinformatics I	3.0
BIO 413	Genomics	3.0
BIO 436	Population Genetics	4.0
ENVS 230	General Ecology	3.0
ENVS 247	Native Plants and Sustainability	3.0
ENVS 323	Tropical Field Studies	3.0
ENVS 328	Conservation Biology	3.0
ENVS 333	Wetland Ecology	3.0
ENVS 343	Equatorial Guinea: Field Methods	3.0
ENVS 352	Ornithology	3.0
ENVS 354	Ichthyology	3.0
ENVS 355	Biogeography	3.0
ENVS 360	Evolutionary Developmental Biology	3.0
ENVS 364	Animal Behavior	3.0
ENVS 382	Field Botany of the New Jersey Pine Barrens	4.0
ENVS 383	Ecology of the New Jersey Pine Barrens	4.0
ENVS 391	Freshwater and Marine Algae	3.0
ENVS 470	Advanced Topics in Evolution	3.0
Laboratory Electives		
BIO 202	Human Physiology Laboratory	2.0
BIO 213	Drosophila Neural Research	3.0
BIO 215	Techniques in Cell Biology	3.0
BIO 222	Microbiology Laboratory	2.0
BIO 232	Discovering Antibiotics	3.0
BIO 257	Vertebrate Morphology & Physiology Lab	2.0
BIO 306	Biochemistry Laboratory	2.0
BIO 329	Dictyostelium Research	3.0
BIO 374	Developmental Biology Lab	2.0
BIO 387	Gross Anatomy I Laboratory	2.0
BIO 389	Gross Anatomy II Lab	2.0
BIO 427	Immunology Laboratory	2.0
BIO 497	Research	0.5-12.0
ENVS 255	Invertebrate Morphology and Physiology Lab	2.0
ENVS 344	Equatorial Guinea: Field Research	6.0
ENVS 353	Field Ornithology Lab	2.0
ENVS 365	Animal Behavior Laboratory	2.0
ENVS 394	Entomology Laboratory	2.0

2. The Organismal Biology/Physiology Concentration

This concentration combines courses in organismal biology and physiology with an opportunity to focus on human physiology. The concentration is designed to appeal to students interested in health and medicine, but also accommodates students seeking a wider breadth of knowledge in organismal diversity. Students can focus their electives in human physiology or can choose courses that study non-human organisms.

Organismal Biology/Physiology Concentration Requirements

BIO 201	Human Physiology I	4.0
or ENVS 254	Invertebrate Morphology and Physiology	
BIO 203	Human Physiology II	4.0
or BIO 256	Vertebrate Morphology and Physiology	
BIO 373	Developmental Biology	3.0
Select one of the following:		
BIO 412	Biology of Aging	3.0
or BIO 284	Biology of Stress	
or BIO 466	Endocrinology	
or BIO 468	Pathophysiology	
Organismal Biology/Physiology Concentration Concentration Electives (See List Below)		
Cell/Molecular/Genetics/Biochemistry (CMGB) Elective		3.0
Two Organismal/Physiology Electives		6.0
Ecology/Evolution/Genomics Elective		3.0
Concentration Laboratory Courses		
Two Laboratory Electives		4.0
Total Credits		30.0

*   Students interesting in pursuing a focus area in Human Physiology or Organismal Biology should contact the academic advisor in the Biology Department for specific focus recommendations.

*Cell/Molecular/Genetics/Biochemistry (CMGB) electives

BIO 244	Genetics I	3.0
BIO 285	Forensic Biology	3.0
BIO 311	Biochemistry	4.0
BIO 314	Pharmacology	3.0
BIO 318	Biology of Cancer	3.0
BIO 346	Stem Cell Research	3.0
BIO 348	Neuroscience: From Cells to Circuits	3.0
BIO 404	Structure and Function of Biomolecules	4.0
BIO 410	Advanced Molecular Biology	3.0
BIO 414	Behavioral Genetics	3.0
BIO 416	Biochemistry of Major Diseases	3.0
BIO 430	Cell Biology of Disease	3.0
BIO 433	Advanced Cell Biology	3.0
BIO 444	Human Genetics	3.0
BIO 453	Protein Dysfunction in Disease	3.0
BIO 462	Biology of Neuron Function	3.0
BIO 463	Molecular Mechanisms of Neurodegeneration	3.0
ENVS 326	Molecular Ecology	3.0

**Organismal/Physiology electives

BIO 201	Human Physiology I	4.0
BIO 203	Human Physiology II	4.0
BIO 221	Microbiology	3.0
BIO 256	Vertebrate Morphology and Physiology	3.0
BIO 264	Ethnobotany	3.0

BIO 284	Biology of Stress	3.0
BIO 286	Forensic Toxicology	3.0
BIO 320	Microbial Pathogenesis	3.0
BIO 323	Parasitology	3.0
BIO 349	Behavioral Neuroscience	3.0
BIO 368	Embryology	4.0
BIO 372	Histology	4.0
BIO 386	Gross Anatomy I	2.0
BIO 388	Gross Anatomy II	2.0
BIO 412	Biology of Aging	3.0
BIO 420	Virology	3.0
BIO 426	Immunology	3.0
BIO 435	Immunobiology of Disease	3.0
BIO 461	Neurobiology of Autism Disorders	3.0
BIO 466	Endocrinology	4.0
BIO 468	Pathophysiology	4.0
ENVS 254	Invertebrate Morphology and Physiology	3.0
ENVS 392	Ichthyology and Herpetology	3.0
ENVS 393	Entomology	3.0

*** Ecology/Evolution/Genomics electives

BIO 228	Evolutionary Biology & Human Health	3.0
BIO 331	Bioinformatics I	3.0
BIO 413	Genomics	3.0
BIO 436	Population Genetics	4.0
ENVS 230	General Ecology	3.0
ENVS 247	Native Plants and Sustainability	3.0
ENVS 323	Tropical Field Studies	3.0
ENVS 328	Conservation Biology	3.0
ENVS 333	Wetland Ecology	3.0
ENVS 343	Equatorial Guinea: Field Methods	3.0
ENVS 352	Ornithology	3.0
ENVS 354	Ichthyology	3.0
ENVS 355	Biogeography	3.0
ENVS 360	Evolutionary Developmental Biology	3.0
ENVS 364	Animal Behavior	3.0
ENVS 382	Field Botany of the New Jersey Pine Barrens	4.0
ENVS 383	Ecology of the New Jersey Pine Barrens	4.0
ENVS 388	Marine Field Methods	4.0
ENVS 391	Freshwater and Marine Algae	3.0
ENVS 438	Biodiversity	3.0
ENVS 470	Advanced Topics in Evolution	3.0

+Laboratory electives

BIO 202	Human Physiology Laboratory	2.0
BIO 213	Drosophila Neural Research	3.0
BIO 215	Techniques in Cell Biology	3.0
BIO 222	Microbiology Laboratory	2.0
BIO 232	Discovering Antibiotics	3.0
BIO 257	Vertebrate Morphology & Physiology Lab	2.0
BIO 306	Biochemistry Laboratory	2.0
BIO 329	Dictyostelium Research	3.0
BIO 333	Bioinformatics Laboratory	2.0
BIO 374	Developmental Biology Lab	2.0
BIO 387	Gross Anatomy I Laboratory	2.0
BIO 389	Gross Anatomy II Lab	2.0
BIO 427	Immunology Laboratory	2.0
BIO 434 [WI]	Advanced Cell Biology Laboratory	2.0
ENVS 255	Invertebrate Morphology and Physiology Lab	2.0
ENVS 344	Equatorial Guinea: Field Research	6.0
ENVS 353	Field Ornithology Lab	2.0

ENVS 365	Animal Behavior Laboratory	2.0
ENVS 394	Entomology Laboratory	2.0

3. The Ecology/Evolution/Genomics Concentration

This concentration focuses on ecological and evolutionary aspects of biology for biology majors who also have specific interests in ecology, evolution or genomics. This concentration is designed to maintain a breadth of knowledge in biology, but also allows students to tailor their course work more specifically to reflect their specific area of interest.

Ecology/Evolution/Genomics Concentration requirements

ENVS 326	Molecular Ecology	3.0
BIO 228	Evolutionary Biology & Human Health	3.0
or BIO 331	Bioinformatics I	
BIO 436	Population Genetics	3.0-4.0
or ENVS 230	General Ecology	
Select one of the following:		3.0-5.0
BIO 221	Microbiology	
BIO 256	Vertebrate Morphology and Physiology	
BIO 323	Parasitology	
BIO 413	Genomics	
BIO 420	Virology	
ENVS 254	Invertebrate Morphology and Physiology	
ENVS 360	Evolutionary Developmental Biology	
ENVS 382	Field Botany of the New Jersey Pine Barrens	
ENVS 391	Freshwater and Marine Algae	
ENVS 392	Ichthyology and Herpetology	
ENVS 393	Entomology	
ENVS 438	Biodiversity	
Ecology/Evolution/Genomics concentration electives		
Select one Cell/Molecular/Genetics/Biochemistry (CMGB) elective (see list below)		3.0
Select one Organismal/Physiology elective (see list below)		3.0
Select two Ecology/Evolution/Genomics electives (see list below)		6.0
Concentration Laboratory Courses		
Select two Laboratory electives (see list below)		4.0
Total Credits		28.0-31.0

* Students interested in pursuing a focus area in Ecology, Evolutionary Biology or Genomics should contact the academic advisor in the Biology Department for specific focus recommendations.

Cell/Molecular/Genetics/Biochemistry (CMGB) electives

BIO 244	Genetics I	3.0
BIO 285	Forensic Biology	3.0
BIO 311	Biochemistry	4.0
BIO 314	Pharmacology	3.0
BIO 318	Biology of Cancer	3.0
BIO 346	Stem Cell Research	3.0
BIO 348	Neuroscience: From Cells to Circuits	3.0
BIO 404	Structure and Function of Biomolecules	4.0
BIO 410	Advanced Molecular Biology	3.0
BIO 414	Behavioral Genetics	3.0
BIO 415	Proteins	3.0
BIO 416	Biochemistry of Major Diseases	3.0
BIO 421	Biomembranes	3.0
BIO 430	Cell Biology of Disease	3.0
BIO 433	Advanced Cell Biology	3.0

BIO 444	Human Genetics	3.0
BIO 453	Protein Dysfunction in Disease	3.0
BIO 462	Biology of Neuron Function	3.0
BIO 463	Molecular Mechanisms of Neurodegeneration	3.0

Organismal/Physiology electives

BIO 201	Human Physiology I	4.0
BIO 221	Microbiology	3.0
BIO 256	Vertebrate Morphology and Physiology	3.0
BIO 264	Ethnobotany	3.0
BIO 284	Biology of Stress	3.0
BIO 286	Forensic Toxicology	3.0
BIO 323	Parasitology	3.0
BIO 349	Behavioral Neuroscience	3.0
BIO 368	Embryology	4.0
BIO 372	Histology	4.0
BIO 373	Developmental Biology	3.0
BIO 386	Gross Anatomy I	2.0
BIO 388	Gross Anatomy II	2.0
BIO 412	Biology of Aging	3.0
BIO 420	Virology	3.0
BIO 426	Immunology	3.0
BIO 461	Neurobiology of Autism Disorders	3.0
ENVS 254	Invertebrate Morphology and Physiology	3.0
ENVS 392	Ichthyology and Herpetology	3.0
ENVS 393	Entomology	3.0

Ecology/Evolution/Genomics electives

BIO 228	Evolutionary Biology & Human Health	3.0
BIO 331	Bioinformatics I	3.0
BIO 332	Bioinformatics II	3.0
BIO 413	Genomics	3.0
BIO 436	Population Genetics	4.0
ENVS 230	General Ecology	3.0
ENVS 247	Native Plants and Sustainability	3.0
ENVS 284	Physiological and Population Ecology	3.0
ENVS 286	Community and Ecosystem Ecology	3.0
ENVS 315	Plant Animal Interactions	3.0
ENVS 322	Tropical Ecology	3.0
ENVS 328	Conservation Biology	3.0
ENVS 330	Aquatic Ecology	3.0
ENVS 333	Wetland Ecology	3.0
ENVS 336	Terrestrial Ecology	5.0
ENVS 343	Equatorial Guinea: Field Methods	3.0
ENVS 352	Ornithology	3.0
ENVS 354	Ichthyology	3.0
ENVS 355	Biogeography	3.0
ENVS 360	Evolutionary Developmental Biology	3.0
ENVS 364	Animal Behavior	3.0
ENVS 382	Field Botany of the New Jersey Pine Barrens	4.0
ENVS 383	Ecology of the New Jersey Pine Barrens	4.0
ENVS 390	Marine Ecology	3.0
ENVS 391	Freshwater and Marine Algae	3.0
ENVS 410	Physiological Ecology	3.0
ENVS 412	Biophysical Ecology	3.0
ENVS 413	Advanced Population Ecology	3.0
ENVS 414	Advanced Community Ecology	3.0
ENVS 438	Biodiversity	3.0
ENVS 470	Advanced Topics in Evolution	3.0

Laboratory electives

BIO 202	Human Physiology Laboratory	2.0
BIO 213	Drosophila Neural Research	3.0
BIO 215	Techniques in Cell Biology	3.0
BIO 222	Microbiology Laboratory	2.0
BIO 232	Discovering Antibiotics	3.0
BIO 257	Vertebrate Morphology & Physiology Lab	2.0
BIO 306	Biochemistry Laboratory	2.0
BIO 329	Dictyostelium Research	3.0
BIO 333	Bioinformatics Laboratory	2.0
BIO 374	Developmental Biology Lab	2.0
BIO 387	Gross Anatomy I Laboratory	2.0
BIO 389	Gross Anatomy II Lab	2.0
BIO 427	Immunology Laboratory	2.0
BIO 497	Research (by permission of the department)	0.5-12.0
ENVS 255	Invertebrate Morphology and Physiology Lab	2.0
ENVS 285 [WI]	Population Ecology Laboratory	2.0
ENVS 287	Community Ecology Laboratory	2.0
ENVS 327	Molecular Ecology Laboratory	2.0
ENVS 336	Terrestrial Ecology	5.0
ENVS 344	Equatorial Guinea: Field Research	6.0
ENVS 353	Field Ornithology Lab	2.0
ENVS 365	Animal Behavior Laboratory	2.0
ENVS 382	Field Botany of the New Jersey Pine Barrens	4.0
ENVS 383	Ecology of the New Jersey Pine Barrens	4.0
ENVS 388	Marine Field Methods	4.0
ENVS 394	Entomology Laboratory	2.0

4. The Pathobiology Concentration

The Pathobiology concentration focuses on pathogenesis, and provides a unique option for students that differs from the more traditional disciplines in cell/molecular/genetics/biochemistry. This concentration is designed to appeal to students with an interest in pursuing careers in areas of public and allied health.

BIO 221	Microbiology	3.0
BIO 320	Microbial Pathogenesis	3.0
BIO 323	Parasitology	3.0
or BIO 420	Virology	
or BIO 435	Immunobiology of Disease	
BIO 426	Immunology	3.0
Select one Cell/Molecular/Genetics/Biochemistry (CMGB) elective (see list below)		3.0
Select two Organismal/Physiology electives (see list below)		6.0
Select one Evolutionary Bio/Ecology elective (see list below)		3.0
Concentration Laboratory Courses		
Two Laboratory electives (see list below)		4.0
Total Credits		28.0

Cell/Molecular/Genetics/Biochemistry (CMGB) electives:

BIO 244	Genetics I	3.0
BIO 285	Forensic Biology	3.0
BIO 311	Biochemistry	4.0
BIO 314	Pharmacology	3.0
BIO 318	Biology of Cancer	3.0
BIO 346	Stem Cell Research	3.0
BIO 348	Neuroscience: From Cells to Circuits	3.0
BIO 404	Structure and Function of Biomolecules	4.0
BIO 410	Advanced Molecular Biology	3.0
BIO 414	Behavioral Genetics	3.0
BIO 415	Proteins	3.0

BIO 416	Biochemistry of Major Diseases	3.0
BIO 421	Biomembranes	3.0
BIO 430	Cell Biology of Disease	3.0
BIO 433	Advanced Cell Biology	3.0
BIO 444	Human Genetics	3.0
BIO 453	Protein Dysfunction in Disease	3.0
BIO 462	Biology of Neuron Function	3.0
BIO 463	Molecular Mechanisms of Neurodegeneration	3.0
ENVS 326	Molecular Ecology	3.0

Organismal/Physiology electives

BIO 201	Human Physiology I	4.0
BIO 203	Human Physiology II	4.0
BIO 221	Microbiology	3.0
BIO 256	Vertebrate Morphology and Physiology	3.0
BIO 284	Biology of Stress	3.0
BIO 286	Forensic Toxicology	3.0
BIO 323	Parasitology	3.0
BIO 349	Behavioral Neuroscience	3.0
BIO 368	Embryology	4.0
BIO 372	Histology	4.0
BIO 373	Developmental Biology	3.0
BIO 386	Gross Anatomy I	2.0
BIO 388	Gross Anatomy II	2.0
BIO 412	Biology of Aging	3.0
BIO 420	Virology	3.0
BIO 435	Immunobiology of Disease	3.0
BIO 461	Neurobiology of Autism Disorders	3.0
BIO 466	Endocrinology	4.0
BIO 468	Pathophysiology	4.0
ENVS 254	Invertebrate Morphology and Physiology	3.0

Ecology/Evolution/Genomics electives

BIO 228	Evolutionary Biology & Human Health	3.0
BIO 331	Bioinformatics I	3.0
BIO 413	Genomics	3.0
BIO 436	Population Genetics	4.0
ENVS 230	General Ecology	3.0
ENVS 247	Native Plants and Sustainability	3.0
ENVS 323	Tropical Field Studies	3.0
ENVS 328	Conservation Biology	3.0
ENVS 333	Wetland Ecology	3.0
ENVS 343	Equatorial Guinea: Field Methods	3.0
ENVS 352	Ornithology	3.0
ENVS 354	Ichthyology	3.0
ENVS 355	Biogeography	3.0
ENVS 360	Evolutionary Developmental Biology	3.0
ENVS 364	Animal Behavior	3.0
ENVS 382	Field Botany of the New Jersey Pine Barrens	4.0
ENVS 383	Ecology of the New Jersey Pine Barrens	4.0
ENVS 391	Freshwater and Marine Algae	3.0
ENVS 438	Biodiversity	3.0
ENVS 470	Advanced Topics in Evolution	3.0

Laboratory electives

BIO 202	Human Physiology Laboratory	2.0
BIO 213	Drosophila Neural Research	3.0
BIO 215	Techniques in Cell Biology	3.0
BIO 222	Microbiology Laboratory	2.0
BIO 232	Discovering Antibiotics	3.0
BIO 257	Vertebrate Morphology & Physiology Lab	2.0

BIO 306	Biochemistry Laboratory	2.0
BIO 329	Dictyostelium Research	3.0
BIO 333	Bioinformatics Laboratory	2.0
BIO 374	Developmental Biology Lab	2.0
BIO 387	Gross Anatomy I Laboratory	2.0
BIO 389	Gross Anatomy II Lab	2.0
BIO 427	Immunology Laboratory	2.0
BIO 497	Research (by permission of the department)	0.5-12.0
ENVS 255	Invertebrate Morphology and Physiology Lab	2.0
ENVS 344	Equatorial Guinea: Field Research	6.0
ENVS 353	Field Ornithology Lab	2.0
ENVS 365	Animal Behavior Laboratory	2.0

5. The General Biology Concentration

This concentration will allow maximum flexibility for students who want to develop their own unique plan of study. The concentration is designed for students who may not have one specific area of interest, but who are looking to be well-rounded in the biological sciences. Students pursuing careers in education, where a wider breadth of knowledge in biology is desirable, may choose to select this concentration.

General Biology Concentration Electives	24.0
2 or 3 Cell/Molecular/Genetics/Biochemistry (CMGB) electives (see list below)	
2 or 3 Organismal/Physiology electives (see list below)	
2 or 3 Ecology/Evolution/Genomics electives (see list below)	
Concentration Laboratory Courses	
Two Laboratory electives (see list below)	4.0
Total Credits	28.0

Cell/Molecular/Genetics/Biochemistry (CMGB) electives

BIO 244	Genetics I	3.0
BIO 285	Forensic Biology	3.0
BIO 311	Biochemistry	4.0
BIO 314	Pharmacology	3.0
BIO 318	Biology of Cancer	3.0
BIO 331	Bioinformatics I	3.0
BIO 332	Bioinformatics II	3.0
BIO 346	Stem Cell Research	3.0
BIO 348	Neuroscience: From Cells to Circuits	3.0
BIO 404	Structure and Function of Biomolecules	4.0
BIO 413	Genomics	3.0
BIO 415	Proteins	3.0
BIO 421	Biomembranes	3.0
BIO 430	Cell Biology of Disease	3.0
BIO 433	Advanced Cell Biology	3.0
BIO 444	Human Genetics	3.0
BIO 447	Advanced Genetics and Molecular Biology	3.0
BIO 451	Genetic Reg Development	3.0
BIO 453	Protein Dysfunction in Disease	3.0
BIO 462	Biology of Neuron Function	3.0
BIO 465	Neurobiology of Disease	3.0
ENVS 326	Molecular Ecology	3.0

Organismal/Physiology electives

BIO 201	Human Physiology I	4.0
BIO 203	Human Physiology II	4.0
BIO 221	Microbiology	3.0
BIO 256	Vertebrate Morphology and Physiology	3.0
BIO 264	Ethnobotany	3.0
BIO 284	Biology of Stress	3.0

BIO 286	Forensic Toxicology	3.0
BIO 320	Microbial Pathogenesis	3.0
BIO 323	Parasitology	3.0
BIO 349	Behavioral Neuroscience	3.0
BIO 368	Embryology	4.0
BIO 372	Histology	4.0
BIO 373	Developmental Biology	3.0
BIO 386	Gross Anatomy I	2.0
BIO 388	Gross Anatomy II	2.0
BIO 412	Biology of Aging	3.0
BIO 420	Virology	3.0
BIO 426	Immunology	3.0
BIO 435	Immunobiology of Disease	3.0
BIO 461	Neurobiology of Autism Disorders	3.0
BIO 466	Endocrinology	4.0
BIO 468	Pathophysiology	4.0
ENVS 254	Invertebrate Morphology and Physiology	3.0
ENVS 392	Ichthyology and Herpetology	3.0
ENVS 393	Entomology	3.0

Ecology/Evolution/Genomics electives

BIO 228	Evolutionary Biology & Human Health	3.0
BIO 331	Bioinformatics I	3.0
BIO 332	Bioinformatics II	3.0
BIO 413	Genomics	3.0
ENVS 230	General Ecology	3.0
ENVS 247	Native Plants and Sustainability	3.0
ENVS 284	Physiological and Population Ecology	3.0
ENVS 286	Community and Ecosystem Ecology	3.0
ENVS 315	Plant Animal Interactions	3.0
ENVS 322	Tropical Ecology	3.0
ENVS 323	Tropical Field Studies	3.0
ENVS 328	Conservation Biology	3.0
ENVS 330	Aquatic Ecology	3.0
ENVS 333	Wetland Ecology	3.0
ENVS 336	Terrestrial Ecology	5.0
ENVS 343	Equatorial Guinea: Field Methods	3.0
ENVS 352	Ornithology	3.0
ENVS 354	Ichthyology	3.0
ENVS 355	Biogeography	3.0
ENVS 360	Evolutionary Developmental Biology	3.0
ENVS 364	Animal Behavior	3.0
ENVS 382	Field Botany of the New Jersey Pine Barrens	4.0
ENVS 383	Ecology of the New Jersey Pine Barrens	4.0
ENVS 388	Marine Field Methods	4.0
ENVS 390	Marine Ecology	3.0
ENVS 391	Freshwater and Marine Algae	3.0
ENVS 410	Physiological Ecology	3.0
ENVS 412	Biophysical Ecology	3.0
ENVS 413	Advanced Population Ecology	3.0
ENVS 414	Advanced Community Ecology	3.0
ENVS 438	Biodiversity	3.0
ENVS 470	Advanced Topics in Evolution	3.0

Laboratory electives

BIO 202	Human Physiology Laboratory	2.0
BIO 213	Drosophila Neural Research	3.0
BIO 215	Techniques in Cell Biology	3.0
BIO 222	Microbiology Laboratory	2.0
BIO 232	Discovering Antibiotics	3.0
BIO 257	Vertebrate Morphology & Physiology Lab	2.0

BIO 306	Biochemistry Laboratory	2.0
BIO 329	Dictyostelium Research	3.0
BIO 333	Bioinformatics Laboratory	2.0
BIO 374	Developmental Biology Lab	2.0
BIO 387	Gross Anatomy I Laboratory	2.0
BIO 389	Gross Anatomy II Lab	2.0
BIO 427	Immunology Laboratory	2.0
BIO 497	Research (by permission of the department)	0.5-12.0
ENVS 255	Invertebrate Morphology and Physiology Lab	2.0
ENVS 285 [WI]	Population Ecology Laboratory	2.0
ENVS 287	Community Ecology Laboratory	2.0
ENVS 327	Molecular Ecology Laboratory	2.0
ENVS 344	Equatorial Guinea: Field Research	6.0
ENVS 353	Field Ornithology Lab	2.0
ENVS 365	Animal Behavior Laboratory	2.0
ENVS 382	Field Botany of the New Jersey Pine Barrens	4.0
ENVS 383	Ecology of the New Jersey Pine Barrens	4.0
ENVS 388	Marine Field Methods	4.0
ENVS 394	Entomology Laboratory	2.0

Note about laboratory credits: ENVS 336, ENVS 382 and ENVS 388 have both a lecture and laboratory component.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plans of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Biological Sciences Major: Four-year Co-op

(Additional sample plans for other co-op options can be viewed below.)

Term 1		Credits
BIO 122	Cells and Genetics	4.5
CHEM 101	General Chemistry I	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0

MATH 121	Calculus I	4.0
or 101	Introduction to Analysis I	
UNIV S101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
BIO 124	Evolution & Organismal Diversity	4.5
CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122 or 102	Calculus II Introduction to Analysis II	4.0
	Term Credits	17.0
Term 3		
BIO 126	Physiology and Ecology	4.5
CHEM 103	General Chemistry III	5.0
COOP 101	Career Management and Professional Development	0.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 239 or 123	Mathematics for the Life Sciences Calculus III	4.0
	Term Credits	16.5
Term 4		
BIO 207	Applications in Biology I	1.0
BIO 209	Cell, Molecular & Developmental Biology I	4.0
BIO 219 [WI]	Techniques in Molecular Biology	3.0
CHEM 241	Organic Chemistry I	4.0
PHYS 152	Introductory Physics I	4.0
	Term Credits	16.0
Term 5		
BIO 208	Applications in Biology II	1.0
BIO 211	Cell, Molecular & Developmental Biology II	4.0
CHEM 242	Organic Chemistry II	4.0
PHYS 153	Introductory Physics II	4.0
UNIV S201	Looking Forward: Academics and Careers	1.0
Biology Laboratory Requirement*		2.0
	Term Credits	16.0
Term 6		
BIO 311 or CHEM 243	Biochemistry Organic Chemistry III	4.0
ENVS 212	Evolution	4.0
PHIL 251	Ethics	3.0
PHYS 154	Introductory Physics III	4.0
	Term Credits	15.0
Term 7		
BIO 224	Form, Function & Evolution of Vertebrates	4.0
BIO 225	Vertebrate Biology and Evolution Laboratory	2.0
Sci, tech, health & human affairs elective		3.0
BIO/ENVS Elective		3.0
Biology Laboratory Requirement		2.0
	Term Credits	14.0
Term 8		
COM 230	Techniques of Speaking	3.0
MATH 410	Scientific Data Analysis I	3.0
BIO/ENVS Elective		3.0
Free Electives		6.0
	Term Credits	15.0
Term 9		
COM 310 [WI]	Technical Communication	3.0
MATH 411	Scientific Data Analysis II	3.0
Humanities/Social Science Elective		3.0
BIO/ENVS Elective		3.0

Free Elective		3.0
	Term Credits	15.0
Term 10		
BIO 471	Seminar in Biological Sciences	2.0
BIO/ENVS Electives		6.0
Free Electives		6.0
	Term Credits	14.0
Term 11		
BIO 472	Seminar in Biological Sciences	2.0
BIO/ENVS Electives		6.0
Humanities/Social Science Elective		3.0
Free Elective		3.0
	Term Credits	14.0
Term 12		
BIO 473 [WI]	Seminar in Biological Sciences	2.0
BIO/ENVS Elective		3.0
Humanities/Social Science Elective		3.0
Free Electives		6.0
	Term Credits	14.0

Total Credit: 182.5

* See degree requirements (p. 28).

Biological Sciences Major: Five-year Co-op

Term 1		Credits
BIO 122	Cells and Genetics	4.5
CHEM 101	General Chemistry I	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121 or 101	Calculus I Introduction to Analysis I	4.0
UNIV S101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
BIO 124	Evolution & Organismal Diversity	4.5
CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122 or 102	Calculus II Introduction to Analysis II	4.0
	Term Credits	17.0
Term 3		
BIO 126	Physiology and Ecology	4.5
CHEM 103	General Chemistry III	5.0
COOP 101	Career Management and Professional Development	0.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 239 or 123	Mathematics for the Life Sciences Calculus III	4.0
	Term Credits	16.5
Term 4		
BIO 207	Applications in Biology I	1.0
BIO 209	Cell, Molecular & Developmental Biology I	4.0
BIO 219 [WI]	Techniques in Molecular Biology	3.0
CHEM 241	Organic Chemistry I	4.0
PHYS 152	Introductory Physics I	4.0
	Term Credits	16.0
Term 5		
BIO 208	Applications in Biology II	1.0
BIO 211	Cell, Molecular & Developmental Biology II	4.0

Biology Laboratory Requirement		2.0
CHEM 242	Organic Chemistry II	4.0
PHYS 153	Introductory Physics II	4.0
UNIV S201	Looking Forward: Academics and Careers	1.0
	Term Credits	16.0
Term 6		
BIO 311	Biochemistry	4.0
or CHEM 243	Organic Chemistry III	
ENVS 212	Evolution	4.0
PHIL 251	Ethics	3.0
PHYS 154	Introductory Physics III	4.0
	Term Credits	15.0
Term 7		
BIO 224	Form, Function & Evolution of Vertebrates	4.0
BIO 225	Vertebrate Biology and Evolution Laboratory	2.0
BIO/ENVS Elective		3.0
Humanities/Social Science Elective		3.0
Sci, tech, health & human affairs elective		3.0
	Term Credits	15.0
Term 8		
COM 230	Techniques of Speaking	3.0
MATH 410	Scientific Data Analysis I	3.0
BIO/ENVS Elective		3.0
Free Elective		6.0
	Term Credits	15.0
Term 9		
COM 310 [WI]	Technical Communication	3.0
MATH 411	Scientific Data Analysis II	3.0
Biology Laboratory Requirement Course[*]		2.0
BIO/ENVS Elective		3.0
Free Elective		3.0
	Term Credits	14.0
Term 10		
BIO 471	Seminar in Biological Sciences	2.0
BIO/ENVS Electives		6.0
Free Electives		6.0
	Term Credits	14.0
Term 11		
BIO 472	Seminar in Biological Sciences	2.0
Free Elective		3.0
Humanities/Social Science Elective		3.0
BIO/ENVS Electives		6.0
	Term Credits	14.0
Term 12		
BIO 473 [WI]	Seminar in Biological Sciences	2.0
Free Electives		6.0
Humanities/Social Science Elective		3.0
BIO/ENVS Elective		3.0
	Term Credits	14.0

Total Credit: 182.5

[*]   See degree requirements (p. 28).

Biological Sciences Major: Four-year Non-co-op

Term 1		Credits
BIO 122	Cells and Genetics	4.5
CHEM 101	General Chemistry I	3.5
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or 111	English Composition I	
MATH 121	Calculus I	4.0
or 101	Introduction to Analysis I	
UNIV S101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
BIO 124	Evolution & Organismal Diversity	4.5
CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or 112	English Composition II	
MATH 122	Calculus II	4.0
or 102	Introduction to Analysis II	
	Term Credits	17.0
Term 3		
BIO 126	Physiology and Ecology	4.5
CHEM 103	General Chemistry III	5.0
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or 113	English Composition III	
MATH 239	Mathematics for the Life Sciences	4.0
or 123	Calculus III	
	Term Credits	16.5
Term 4		
BIO 207	Applications in Biology I	1.0
BIO 209	Cell, Molecular & Developmental Biology I	4.0
BIO 219 [WI]	Techniques in Molecular Biology	3.0
CHEM 241	Organic Chemistry I	4.0
PHYS 152	Introductory Physics I	4.0
	Term Credits	16.0
Term 5		
BIO 208	Applications in Biology II	1.0
BIO 211	Cell, Molecular & Developmental Biology II	4.0
Biology Laboratory Requirement		2.0
CHEM 242	Organic Chemistry II	4.0
PHYS 153	Introductory Physics II	4.0
UNIV S201	Looking Forward: Academics and Careers	1.0
	Term Credits	16.0
Term 6		
BIO 224	Form, Function & Evolution of Vertebrates	4.0
BIO 225	Vertebrate Biology and Evolution Laboratory	2.0
BIO 311	Biochemistry	4.0
or CHEM 243	Organic Chemistry III	
PHIL 251	Ethics	3.0
PHYS 154	Introductory Physics III	4.0
	Term Credits	17.0
Term 7		
MATH 410	Scientific Data Analysis I	3.0
ENVS 212	Evolution	4.0
BIO/ENVS Elective		3.0
Humanities/Social Science Elective		3.0
Sci, tech, health & human affairs elective		3.0
	Term Credits	16.0
Term 8		
COM 310 [WI]	Technical Communication	3.0
MATH 411	Scientific Data Analysis II	3.0
BIO/ENVS Elective		3.0
Humanities/Social Science Elective		3.0
	Term Credits	12.0
Term 9		
COM 230	Techniques of Speaking	3.0
BIO/ENVS Elective		3.0
Biology Laboratory Requirement Course[*]		2.0
Humanities/Social Science Elective		3.0

Free Elective		3.0
	Term Credits	14.0
Term 10		
BIO 471	Seminar in Biological Sciences	2.0
BIO/ENVS Electives		6.0
Free Electives		6.0
	Term Credits	14.0
Term 11		
BIO 472	Seminar in Biological Sciences	2.0
Free Elective		6.0
BIO/ENVS Electives		6.0
	Term Credits	14.0
Term 12		
BIO 473 [WI]	Seminar in Biological Sciences	2.0
Free Electives		9.0
BIO/ENVS Elective		3.0
	Term Credits	14.0

Total Credit: 182.5

*   See degree requirements (p. 28).

Co-op/Career Opportunities

Opportunities

Students earn a bachelor's degree in the biological sciences and are prepared for technical careers in research or commercial laboratories or for professional schools.

Graduates typically work for pharmaceutical companies, university and medical research laboratories, biotechnology companies, or in government laboratories. Many graduates also choose to pursue an advanced degree in the medical, dental and veterinary disciplines; or Masters or PhD degrees in Biology-related fields and Public Health.

Co-op Opportunitiess

Past co-op employers of biosciences majors have included:

- GlaxoSmithKline
- Fox Chase Cancer Center
- Children's Hospital of Philadelphia
- Johnson and Johnson
- Merck
- Wistar Institute
- Moss Rehab
- ViroPharma, Inc.
- Janssen Biotech
- Integral Molecular

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Dual/Accelerated Degree

Combined Bachelors/Masters Degree

Qualified students can take graduate courses in their junior and senior years for graduate credit. They can also complete a combined BS /MS degree in five years. Further questions about the BS /MS degree program should be directed to the departmental graduate advisor:

Kate Pelusi
Graduate Program Manager
Department of Biology
215.895.6374
kp475@drexel.edu

Facilities

The Department of Biology resides in the Papadakis Integrated Sciences Building (PISB). This state of the art facility has well-equipped teaching laboratories with networked computers and advanced digital image analysis capability. Both teaching and research laboratories contain a range of modern equipment including basic and cutting-edge light microscopes, confocal microscopy facilities, a Cell Imaging Center, basic and analytical ultacentrifuges, spectrophotometers, scintillation and luminescence counters, densitometers and cell culture facilities.

Visit the Research in Biology (http://www.drexel.edu/coas/academics/departments-centers/biology/research/) web page for more information.

Biological Sciences Faculty

Michael Akins, PhD *(Yale University)*. Assistant Professor. The neural mechanisms underlying how organisms interact with the environment; circuit formation, particularly of sensory circuits, and neural diseases including autism and Fragile X syndrome (FXS).

Shivanthi Anandan, PhD *(University of California, Los Angeles) Interim Vice Provost for Undergraduate Education*. Associate Professor. Microbial genetics, in particular the analysis of light-regulated signal transduction pathways and the regulation of gene expression in photosynthesizing organisms.

John R. Bethea, PhD *(University of Alabama at Birmingham)*. Professor. Neuroscience and immunology.

Valerie Bracchi-Ricard, PhD *(University Joseph Fourier, Grenoble, France)*. Research Assistant Professor. Role of TNF and TNF receptors in neuroinflammation and remyelination following spinal cord injury.

Laura Duwel, PhD *(University of Cincinnati) Assistant Department Head, Department of Biology*. Teaching Professor. Immunology and microbiology.

Felice Elefant, PhD *(Temple University) Director of the Biology Graduate Program*. Professor. Understanding the roles of two classes of chromatin regulatory proteins termed histone acetyltransferases(HATs)and histone de-methylases.

Roman Fischer, PhD *(University of Stuttgart, Germany)*. Research Assistant Professor. Regenerative and anti-inflammatory therapies to treat autoimmune and neurodegenerative diseases.

Denise Garcia, PhD *(UCLA)*. Associate Professor. Neuroscience, the role of astrocytes in the central nervous system.

Tali Gidalevitz, PhD *(University of Chicago)*. Associate Professor. Genetic and molecular pathways regulating protein folding homeostasis, and their role in protein conformation diseases, aging, and development.

Mary Katherine Gonder, PhD *(The City University of New York) Director, Bioko Biodiversity Protection Program Co-Founder, Central African Biodiversity Alliance*. Professor. Deciphering spatial patterns of biodiversity across the Gulf of Guinea and Congo Basin region;

Conservation measures to mitigate the effects of habitat loss and climate change in western equatorial Africa.

Susan Gurney, PhD *(Westfälische Wilhelms-Universität Münster (Germany))*. Associate Teaching Professor. Evolutionary genetics (human and equids); stem cell biology; forensic science

Meshagae Hunte-Brown, PhD *(Drexel University)*. Teaching Professor. Stable isotopes in aquatic food webs, ecosystem ecology, STEM education.

Jiu Jiang, MD, PhD *(Shanghai Second Medical University)*. Research Associate Professor. T cell immune response to virus infection in aged mice.

Karen Kabnick, PhD *(Massachusetts Institute of Technology)*. Associate Teaching Professor. Molecular and genetic mechanisms of cellular biology, human disease, host/parasite interactions.

Kari Lenhart, PhD *(Princeton University)*. Assistant Professor. Coordination of stem cell behavior and regulation of stem cell cytokinesis in the young and aged niche.

Robert Loudon, PhD *(Thomas Jefferson University)*. Associate Teaching Professor. Rho GTPases, regulation of actin cytoskeleton, Regulation of G protein-coupled receptors by receptor kinases and arrestins.

Daniel Marenda, PhD *(Syracuse University)*. Associate Professor. Developmental neurobiology and behavior; CHARGE syndrome; Pitt-Hopkins syndrome; Alzheimer's disease.

Donna Murasko, PhD *(Penn State Hershey Medical Center) Dean Emeritus*. Professor. The effects of aging on the adaptive immune response to influenza virus and retrovirus latency and reactivation.

Michael O'Connor, MD, PhD *(MD, Johns Hopkins University; PhD, Colorado State)*. Professor. Biophysical and physiological ecology, thermoregulation of vertebrates, ecological modeling.

Sean O'Donnell, PhD *(University of Wisconsin-Madison)*. Professor. Tropical ecology, focusing on geographic variation and elevation effects on ecology and behavior of army ants and ant-bird interactions; neurobiology, focusing on brain plasticity and brain evolution in social insects.

Ryan Petrie, PhD *(McGill University)*. Assistant Professor. Mechanisms of cell movement through three-dimensional extracellular matrix.

Jerome Ricard, PhD *(University Joseph Fourier, Grenoble, France)*. Research Assistant Professor. Inflammation and cell death after spinal cord injury. Regulation of cell death by Eph receptors.

Jacob Russell, PhD *(University of Arizona)*. Professor. Microbiomes and metagenomics; ecology and evolution of symbiosis.

Nianli Sang, MB, PhD *(M.B., Fudan University Shanghai Medical College; Ph.D., Thomas Jefferson University) Co-Director of the Cell Imaging Center*. Associate Professor. Molecular and cellular biology of cancer; posttranslational modification, folding and quality control of proteins and their implication in cell physiology and human diseases.

Aleister Saunders, PhD *(University of North Carolina, Chapel Hill) Senior Vice Provost for Research, Director of the RNAi Resource Center*. Professor. Identification and characterization of genes and proteins involved in Alzheimer's disease.

Kevin P.W. Smith, PhD *(Drexel University)*. Assistant Teaching Professor. Linking behavioral ecology and organismal diversity, neonate behavior in herpetological models, STEM education.

Elias T. Spiliotis, PhD *(The Johns Hopkins University) Director of the Cell Imaging Center* . Associate Professor. Cell polarity and cell division: regulation of cytoskeleton-dependent motility.

Jennifer Stanford, PhD *(Harvard University)*. Associate Professor. Evaluating and improving approaches to teach STEM content in higher education environments to promote student learning, engagement in STEM courses, and STEM student retention.

Khakhina Svetlana, PhD *(Rowan University, GSBS)*. Assistant Teaching Professor. Host-pathogen interactions. Exploring the diversity of bacteriophages and antibiotic-production bacteria to use it as tolls provided by nature to treat antibiotic-resistant bacterial infections.

Monica M. Togna, PhD *(New Jersey Institute of Technology)*. Assistant Teaching Professor. Examination of the structure and function of living organisms from the cellular to the organismal level in order to better understand common physiological processes.

Emeritus Faculty

Joseph Bentz, PhD *(State University of New York [SUNY] at Buffalo)*. Professor Emeritus. Biophysics, biochemistry and biopharmaceutics, focused on the molecular basis of biological membrane transport and fusion.

Cecilie Goodrich, PhD *(Harvard University)*. Professor Emeritus. Neuroscience and systems physiology, postnatal maturation of physiology and behavior in relation to brain immunocytochemistry.

Chemistry

Major: Chemistry
Degree Awarded: Bachelor of Arts (BA) or Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: BA -184.5; BS - 190.5
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 40.0501
Standard Occupational Classification (SOC) code: 19-2031

About the Program

Drexel's Department of Chemistry offers both a BA and a BS degree in chemistry. The BA is offered as a 4-year non-co-op program for those interested in following their undergraduate education in chemistry with professional school, such as law or medicine. The BS degree, offered in three formats (a 5-year three co-op, 4-year one co-op and a 4-year non-co-op), is certified by the American Chemical Society. In addition, a minor in chemistry is available for students in other majors who desire a strong physical science background.

Each student plans a course of study and selects electives in consultation with an advisor in the Department of Chemistry (http://www.drexel.edu/coas/academics/departments-centers/chemistry/). Students who show initiative and laboratory ability are encouraged to participate in undergraduate research by selecting a research problem in collaboration with one of the departmental faculty members. Students in the BS

program are required to participate in undergraduate research through the Senior Research courses.

Most graduate courses in chemistry are open to qualified seniors. Prerequisites and descriptions of available graduate courses appear in the graduate catalog.

Additional Information

For more information about the major in chemistry, contact:

Daniel King, PhD
Undergraduate Affairs Committee Chair
Department of Chemistry
Drexel University
dk68@drexel.edu

Degree Requirements (BA)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements *		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV S101	The Drexel Experience	1.0
CIVC 101	Introduction to Civic Engagement	1.0
UNIV S201	Looking Forward: Academics and Careers	1.0
Humanities and Arts electives		6.0
International Studies electives		6.0
Social and Behavioral Studies electives		6.0
Studies in Diversity electives		6.0
Language Requirements courses		8.0-12.0
CHEM 121	Majors Chemistry I	5.0
CHEM 122	Majors Chemistry II	5.0
CHEM 123	Majors Chemistry III	5.5
CHEM 230	Quantitative Analysis	4.0
CHEM 231 [WI]	Quantitative Analysis Laboratory	2.0
CHEM 246	Organic Chemistry for Majors I	6.5
CHEM 248	Organic Chemistry for Majors II	6.5
CHEM 249	Organic Chemistry for Majors III	7.0
CHEM 253	Thermodynamics and Kinetics	4.0
CHEM 270	Software Skills for Chemists	3.0
CHEM 357 [WI]	Physical Chemistry Laboratory I	2.5
CHEM 367	Chemical Information Retrieval	3.0
CHEM 421	Inorganic Chemistry I	3.0
Chemistry Electives		
Select two Chemistry Electives **		6.0
Biology Requirements		
BIO 122	Cells and Genetics	4.5
BIO 124	Evolution & Organismal Diversity	4.5
BIO 126	Physiology and Ecology	4.5
Mathematics Requirements		
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
MATH 200	Multivariate Calculus	4.0

Physics Requirements		
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
PHYS 201	Fundamentals of Physics III	4.0
Free Electives		
Free electives ***		32.0-36.0
Total Credits		184.5

* Categories of Electives:
  - *Humanities and Arts Electives*
    Designated courses in art, art history, communication studies, foreign languages (300-level or above), history, literature, music, philosophy, religion, and theatre arts.
  - *International Electives*
    Designated courses in anthropology, art history, history, literature, music, politics and sociology. Courses with an international focus may be used to fulfill requirements in other categories as well.
  - *Social and Behavioral Studies Electives*
    Designated courses in anthropology, criminal justice, economics, international relations, history, politics, psychology and sociology.
  - *Studies in Diversity Electives*
    Africana studies, women's studies or designated cross-listed courses in anthropology, art, art history, history, literature, music, philosophy, politics and sociology.
  - *Language Requirement*
    Students may satisfy the language course requirements in two ways: (1) complete at least 8 credits of a foreign language at Drexel and, at minimum, must complete the 103 level of the target language (or beyond if they place higher); or (2) take two terms of a computer language.

** Courses with CHEM prefix, although ENVS chemistry courses can also fulfill this requirement (with Department approval).

*** The total number of free elective credits depends on the number of credits required to fulfill the language requirement.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study (BA)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Four-year One-Co-op

Term 1

		Credits
BIO 122	Cells and Genetics	4.5
CHEM 121	Majors Chemistry I	5.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121	Calculus I	4.0
UNIV S101	The Drexel Experience	1.0
	Term Credits	17.5

Term 2

BIO 124	Evolution & Organismal Diversity	4.5
CHEM 122	Majors Chemistry II	5.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122	Calculus II	4.0
	Term Credits	17.5

Term 3

BIO 126	Physiology and Ecology	4.5
CHEM 123	Majors Chemistry III	5.5
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 123	Calculus III	4.0
	Term Credits	17.0

Term 4

CHEM 230 *	Quantitative Analysis	4.0
CHEM 231 [WI] *	Quantitative Analysis Laboratory	2.0
CHEM 246	Organic Chemistry for Majors I	6.5
Free elective		3.0
	Term Credits	15.5

Term 5

CHEM 248	Organic Chemistry for Majors II	6.5
MATH 200	Multivariate Calculus	4.0
PHYS 101	Fundamentals of Physics I	4.0
	Term Credits	14.5

Term 6

CHEM 249	Organic Chemistry for Majors III	7.0
PHYS 102	Fundamentals of Physics II	4.0
Humanities electives		6.0
	Term Credits	17.0

Term 7

PHYS 201	Fundamentals of Physics III	4.0
International Studies elective		3.0
Free electives		6.0
	Term Credits	13.0

Term 8

CHEM 253	Thermodynamics and Kinetics	4.0
CHEM 367	Chemical Information Retrieval	3.0
CHEM 421	Inorganic Chemistry I	3.0
UNIV S201	Looking Forward: Academics and Careers	1.0
Language elective		4.0
	Term Credits	15.0

Term 9

CHEM 270	Software Skills for Chemists	3.0
CHEM 357 [WI]	Physical Chemistry Laboratory I	2.5
Language elective		4.0
Diversity Studies elective		3.0
Social and Behavioral Studies elective		3.0
	Term Credits	15.5

Term 10

Chemistry elective		3.0
Social and Behavioral Studies elective		3.0
Diversity Studies elective		3.0
Free electives		6.0
	Term Credits	15.0

Term 11

Chemistry elective		3.0
International Studies elective		3.0
Free elective		9.0
	Term Credits	15.0

Term 12

Free electives		12.0
	Term Credits	12.0

Total Credit: 184.5

* CHEM 230 and CHEM 231 [WI] should be taken concurrently.

Degree Requirements (BS)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV S101	The Drexel Experience	1.0
CIVC 101	Introduction to Civic Engagement	1.0
UNIV S201	Looking Forward: Academics and Careers	1.0
Technical electives *		6.0
Liberal Studies electives *		6.0
Chemistry Requirements		
CHEM 121	Majors Chemistry I	5.0
CHEM 122	Majors Chemistry II	5.0
CHEM 123	Majors Chemistry III	5.5
CHEM 230	Quantitative Analysis	4.0
CHEM 231 [WI]	Quantitative Analysis Laboratory	2.0
CHEM 246	Organic Chemistry for Majors I	6.5
CHEM 248	Organic Chemistry for Majors II	6.5
CHEM 249	Organic Chemistry for Majors III	7.0
CHEM 253	Thermodynamics and Kinetics	4.0
CHEM 270	Software Skills for Chemists	3.0
CHEM 346	Qualitative Organic Chemistry	5.5
CHEM 355	Physical Chemistry IV	3.0
CHEM 357 [WI]	Physical Chemistry Laboratory I	2.5
CHEM 358	Physical Chemistry Laboratory II	2.5
CHEM 359	Atomic and Molecular Spectroscopy	3.0
CHEM 367	Chemical Information Retrieval	3.0
CHEM 420	Molecular Symmetry and Group Theory Applied Chemistry	3.0
CHEM 421	Inorganic Chemistry I	3.0
CHEM 422	Inorganic Chemistry II	3.0
CHEM 425	Inorganic Chemistry Laboratory	4.0
CHEM 430	Analytical Chemistry I	3.0
CHEM 431 [WI]	Analytical Chemistry II	4.0
CHEM 493	Senior Research Project	9.0
Biology Requirements		

BIO 122	Cells and Genetics	4.5
BIO 214	Principles of Cell Biology	3.0
Biochemistry Requirements [**]		
BIO 311	Biochemistry	4.0
or BIO 404	Structure and Function of Biomolecules	
BIO 306	Biochemistry Laboratory	2.0
Computer/Mathematics Requirements		
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
MATH 200	Multivariate Calculus	4.0
MATH 201	Linear Algebra	4.0
or MATH 210	Differential Equations	
Physics Requirements		
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
PHYS 201	Fundamentals of Physics III	4.0
Free Electives		
Free electives		24.0
Total Credits		190.5

Footnotes

*   Technical electives are defined as 200+ level courses from Science, Mathematics, Business, Engineering or Information Studies. Liberal studies electives are defined as courses (at any level) from all other areas.

** The American Chemical Society requires ACS-certified students to take a specified number of biochemistry courses. To fulfill this requirement in the BS curriculum, you should take a combination of one lecture and one lab course from the choice of: BIO 311, BIO 306 or BIO 404 to fulfill the biochemistry requirement. Students may also choose to take the two lecture courses (BIO 404 and BIO 311) rather than a lecture/laboratory combination.

Footnotes
*   Technical electives are defined as 200+ level courses from Science, Mathematics, Business, Engineering or Information Studies. Liberal studies electives are defined as courses (at any level) from all other areas.

** The American Chemical Society requires ACS-certified students to take a specified number of biochemistry courses. To fulfill this requirement in the BS curriculum, you should take a combination of one lecture and one lab course from the choice of: BIO 311, BIO 306 or BIO 404 to fulfill the biochemistry requirement. Students may also choose to take the two lecture courses (BIO 404 and BIO 311) rather than a lecture/laboratory combination.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plans of Study (BS)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Five-year Co-op

(See below this plan for Four-year Non-Co-op and One-Co-op options)

Term 1		Credits
BIO 122	Cells and Genetics	4.5
CHEM 121	Majors Chemistry I	5.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121	Calculus I	4.0
UNIV S101	The Drexel Experience	1.0
	Term Credits	17.5
Term 2		
CHEM 122	Majors Chemistry II	5.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122	Calculus II	4.0
PHYS 101	Fundamentals of Physics I	4.0
CIVC 101	Introduction to Civic Engagement	1.0
	Term Credits	17.0
Term 3		
CHEM 123	Majors Chemistry III	5.5
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 123	Calculus III	4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	16.5
Term 4		
CHEM 230 [*]	Quantitative Analysis	4.0
CHEM 231 [WI] [*]	Quantitative Analysis Laboratory	2.0
CHEM 246	Organic Chemistry for Majors I	6.5
PHYS 201	Fundamentals of Physics III	4.0
	Term Credits	16.5
Term 5		
CHEM 248	Organic Chemistry for Majors II	6.5
MATH 200	Multivariate Calculus	4.0
Free elective		3.0
	Term Credits	13.5
Term 6		
BIO 214	Principles of Cell Biology	3.0
CHEM 249	Organic Chemistry for Majors III	7.0
CHEM 253	Thermodynamics and Kinetics	4.0
MATH 210 or 201	Differential Equations Linear Algebra	4.0
	Term Credits	18.0
Term 7		

CHEM 270	Software Skills for Chemists	3.0
CHEM 357 [WI]	Physical Chemistry Laboratory I	2.5
Technical elective***		3.0
Free electives		6.0
	Term Credits	14.5
Term 8		
CHEM 355	Physical Chemistry IV	3.0
CHEM 367	Chemical Information Retrieval	3.0
CHEM 421	Inorganic Chemistry I	3.0
CHEM 430	Analytical Chemistry I	3.0
UNIV S201	Looking Forward: Academics and Careers	1.0
	Term Credits	13.0
Term 9		
CHEM 359	Atomic and Molecular Spectroscopy	3.0
CHEM 420	Molecular Symmetry and Group Theory Applied Chemistry	3.0
CHEM 431 [WI]	Analytical Chemistry II	4.0
Technical elective***		3.0
Free elective		3.0
	Term Credits	16.0
Term 10		
BIO 311	Biochemistry	4.0
or 404	Structure and Function of Biomolecules	
CHEM 346	Qualitative Organic Chemistry	5.5
CHEM 493	Senior Research Project	3.0
CHEM 358	Physical Chemistry Laboratory II	2.5
	Term Credits	15.0
Term 11		
BIO 306	Biochemistry Laboratory	2.0
CHEM 493	Senior Research Project	3.0
Liberal Studies electives		6.0
Free electives		6.0
	Term Credits	17.0
Term 12		
CHEM 422	Inorganic Chemistry II	3.0
CHEM 425	Inorganic Chemistry Laboratory	4.0
CHEM 493	Senior Research Project	3.0
Free electives		6.0
	Term Credits	16.0

Total Credit: 190.5

BS in Chemistry: Four-year Non-Co-op

Term 1		**Credits**
BIO 122	Cells and Genetics	4.5
CHEM 121	Majors Chemistry I	5.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or 111	English Composition I	
MATH 121	Calculus I	4.0
UNIV S101	The Drexel Experience	1.0
	Term Credits	17.5
Term 2		
CHEM 122	Majors Chemistry II	5.0
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or 112	English Composition II	
MATH 122	Calculus II	4.0
PHYS 101	Fundamentals of Physics I	4.0
CIVC 101	Introduction to Civic Engagement	1.0
	Term Credits	17.0
Term 3		
CHEM 123	Majors Chemistry III	5.5
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or 113	English Composition III	

MATH 123	Calculus III	4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	16.5
Term 4		
CHEM 230*	Quantitative Analysis	4.0
CHEM 231 [WI]*	Quantitative Analysis Laboratory	2.0
CHEM 246	Organic Chemistry for Majors I	6.5
PHYS 201	Fundamentals of Physics III	4.0
	Term Credits	16.5
Term 5		
CHEM 248	Organic Chemistry for Majors II	6.5
MATH 200	Multivariate Calculus	4.0
Free elective		6.0
	Term Credits	16.5
Term 6		
BIO 214	Principles of Cell Biology	3.0
CHEM 249	Organic Chemistry for Majors III	7.0
MATH 210	Differential Equations	4.0
or 201	Linear Algebra	
Technical elective***		3.0
	Term Credits	17.0
Term 7		
CHEM 253	Thermodynamics and Kinetics	4.0
CHEM 367	Chemical Information Retrieval	3.0
CHEM 421	Inorganic Chemistry I	3.0
CHEM 430	Analytical Chemistry I	3.0
UNIV S201	Looking Forward: Academics and Careers	1.0
	Term Credits	14.0
Term 8		
CHEM 270	Software Skills for Chemists	3.0
CHEM 357 [WI]	Physical Chemistry Laboratory I	2.5
CHEM 420	Molecular Symmetry and Group Theory Applied Chemistry	3.0
CHEM 431 [WI]	Analytical Chemistry II	4.0
Free elective		3.0
	Term Credits	15.5
Term 9		
Liberal Studies elective		3.0
Technical elective***		3.0
Free electives		9.0
	Term Credits	15.0
Term 10		
BIO 311	Biochemistry	4.0
or 404	Structure and Function of Biomolecules	
CHEM 346	Qualitative Organic Chemistry	5.5
CHEM 355	Physical Chemistry IV	3.0
CHEM 493	Senior Research Project	3.0
	Term Credits	15.5
Term 11		
BIO 306	Biochemistry Laboratory	2.0
CHEM 359	Atomic and Molecular Spectroscopy	3.0
CHEM 493	Senior Research Project	3.0
Liberal Studies elective		3.0
Free elective		3.0
	Term Credits	14.0
Term 12		
CHEM 358	Physical Chemistry Laboratory II	2.5
CHEM 422	Inorganic Chemistry II	3.0
CHEM 425	Inorganic Chemistry Laboratory	4.0
CHEM 493	Senior Research Project	3.0

Free elective		3.0
	Term Credits	15.5

Total Credit: 190.5

BS in Chemistry: Four-year One Co-op

Term 1		Credits
BIO 122	Cells and Genetics	4.5
CHEM 121	Majors Chemistry I	5.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121	Calculus I	4.0
UNIV S101	The Drexel Experience	1.0
	Term Credits	17.5
Term 2		
CHEM 122	Majors Chemistry II	5.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122	Calculus II	4.0
PHYS 101	Fundamentals of Physics I	4.0
CIVC 101	Introduction to Civic Engagement	1.0
	Term Credits	17.0
Term 3		
CHEM 123	Majors Chemistry III	5.5
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 123	Calculus III	0.0-4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	12.5-16.5
Term 4		
CHEM 230 *	Quantitative Analysis	4.0
CHEM 231 [WI] *	Quantitative Analysis Laboratory	2.0
CHEM 246	Organic Chemistry for Majors I	6.5
PHYS 201	Fundamentals of Physics III	4.0
	Term Credits	16.5
Term 5		
CHEM 248	Organic Chemistry for Majors II	6.5
MATH 200	Multivariate Calculus	4.0
Electives		6.0
	Term Credits	16.5
Term 6		
BIO 214	Principles of Cell Biology	4.0
CHEM 249	Organic Chemistry for Majors III	7.0
MATH 210 or 201	Differential Equations Linear Algebra	4.0
Technical Elective ***		3.0
	Term Credits	18.0
Term 7		
Free Electives		9.0
Liberal Studies Elective		3.0
Technical Elective ***		3.0
	Term Credits	15.0
Term 8		
CHEM 253	Thermodynamics and Kinetics	4.0
CHEM 367	Chemical Information Retrieval	3.0
CHEM 421	Inorganic Chemistry I	3.0
CHEM 430	Analytical Chemistry I	3.0
UNIV S201	Looking Forward: Academics and Careers	1.0
	Term Credits	14.0
Term 9		
CHEM 270	Software Skills for Chemists	3.0
CHEM 357 [WI]	Physical Chemistry Laboratory I	2.5

CHEM 420	Molecular Symmetry and Group Theory Applied Chemistry	3.0
CHEM 431 [WI]	Analytical Chemistry II	4.0
Elective		3.0
	Term Credits	15.5
Term 10		
BIO 311 or 404	Biochemistry Structure and Function of Biomolecules	4.0
CHEM 346	Qualitative Organic Chemistry	5.5
CHEM 355	Physical Chemistry IV	3.0
CHEM 493	Senior Research Project	3.0
	Term Credits	15.5
Term 11		
BIO 306	Biochemistry Laboratory	2.0
CHEM 359	Atomic and Molecular Spectroscopy	3.0
CHEM 493	Senior Research Project	3.0
Free Elective		3.0
Liberal Studies Elective		3.0
	Term Credits	14.0
Term 12		
CHEM 358	Physical Chemistry Laboratory II	2.5
CHEM 422	Inorganic Chemistry II	3.0
CHEM 425	Inorganic Chemistry Laboratory	4.0
CHEM 493	Senior Research Project	3.0
Free Elective		3.0
	Term Credits	15.5

Total Credit: 187.5-191.5

*   CHEM 230 and CHEM 231 must be taken concurrently.

**   *Biochemistry Requirement:* The American Chemical Society requires ACS-certified students to take a specified number of biochemistry courses. To fulfill this requirement in the BS curriculum, you should take a combination of one lecture and one lab course from the choice of: BIO 311, BIO 306 or BIO 404 to fulfill the biochemistry requirement. Students may also choose to take the two lecture courses (BIO 404 and BIO 311) rather than a lecture/laboratory combination. Note that the courses BIO 122 and BIO 214 are required in order to provide adequate background in biology for taking these upper-level biochemistry courses.

***   Must be at a 200+ level. See Degree Requirements for more information on acceptable classes.

Chemistry BS - Biochemistry Concentration Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV S101	The Drexel Experience	2.0
CIVC 101	Introduction to Civic Engagement	1.0
UNIV S201	Looking Forward: Academics and Careers	1.0
Technical electives *		6.0
Liberal Studies electives *		6.0

Chemistry Requirements		
CHEM 121	Majors Chemistry I	5.0
CHEM 122	Majors Chemistry II	5.0
CHEM 123	Majors Chemistry III	5.5
CHEM 230	Quantitative Analysis	4.0
CHEM 231 [WI]	Quantitative Analysis Laboratory	2.0
CHEM 246	Organic Chemistry for Majors I	6.5
CHEM 248	Organic Chemistry for Majors II	6.5
CHEM 249	Organic Chemistry for Majors III	7.0
CHEM 253	Thermodynamics and Kinetics	4.0
CHEM 270	Software Skills for Chemists	3.0
CHEM 346	Qualitative Organic Chemistry	5.5
CHEM 357 [WI]	Physical Chemistry Laboratory I	2.5
CHEM 367	Chemical Information Retrieval	3.0
CHEM 420	Molecular Symmetry and Group Theory Applied Chemistry	3.0
CHEM 421	Inorganic Chemistry I	3.0
CHEM 422	Inorganic Chemistry II	3.0
CHEM 425	Inorganic Chemistry Laboratory	4.0
CHEM 430	Analytical Chemistry I	3.0
CHEM 431 [WI]	Analytical Chemistry II	4.0
CHEM 493	Senior Research Project	9.0
Biology Requirements		
BIO 122	Cells and Genetics	4.5
BIO 214	Principles of Cell Biology	3.0
Biochemistry Requirements		
CHEM 371	Chemistry of Biomolecules	3.0
BIO 311	Biochemistry	4.0
BIO 306	Biochemistry Laboratory	2.0
BIO 404	Structure and Function of Biomolecules	4.0
Computer/Mathematics Requirements		
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
MATH 200	Multivariate Calculus	4.0
MATH 201	Linear Algebra	4.0
Physics Requirements		
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
PHYS 201	Fundamentals of Physics III	4.0
Free electives		
Free electives		24.0
Total Credits		189.0

*   Technical electives are defined as 200+ level courses from Science, Mathematics, Business, Engineering or Information Science. Liberal studies electives are defined as courses (at any level) from all other areas.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Chemistry (BS) - Biochemistry Concentration Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Five-year Co-op

(See below this plan for Four-year Non-Co-op and Four-year One-Co-op options)

Term 1		Credits
CHEM 121	Majors Chemistry I	5.0
BIO 122	Cells and Genetics	4.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121	Calculus I	4.0
UNIV S101	The Drexel Experience	1.0
	Term Credits	17.5
Term 2		
CHEM 122	Majors Chemistry II	5.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122	Calculus II	4.0
PHYS 101	Fundamentals of Physics I	4.0
CIVC 101	Introduction to Civic Engagement	1.0
	Term Credits	17.0
Term 3		
CHEM 123	Majors Chemistry III	5.5
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 123	Calculus III	0.0-4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	12.5-16.5
Term 4		
CHEM 230*	Quantitative Analysis	4.0
CHEM 231 [WI]*	Quantitative Analysis Laboratory	2.0
CHEM 246	Organic Chemistry for Majors I	6.5
PHYS 201	Fundamentals of Physics III	4.0
	Term Credits	16.5
Term 5		
CHEM 248	Organic Chemistry for Majors II	6.5
MATH 200	Multivariate Calculus	4.0
Free elective		3.0
	Term Credits	13.5
Term 6		
CHEM 249	Organic Chemistry for Majors III	7.0
CHEM 253	Thermodynamics and Kinetics	4.0
BIO 214	Principles of Cell Biology	4.0
MATH 201	Linear Algebra	4.0
	Term Credits	19.0

Term 7

CHEM 270	Software Skills for Chemists	3.0
CHEM 357 [WI]	Physical Chemistry Laboratory I	2.5
Technical elective**		3.0
Free electives		6.0
	Term Credits	14.5

Term 8

CHEM 367	Chemical Information Retrieval	3.0
CHEM 421	Inorganic Chemistry I	3.0
CHEM 430	Analytical Chemistry I	3.0
BIO 311	Biochemistry	4.0
UNIV S201	Looking Forward: Academics and Careers	1.0
	Term Credits	14.0

Term 9

CHEM 420	Molecular Symmetry and Group Theory Applied Chemistry	3.0
CHEM 431 [WI]	Analytical Chemistry II	4.0
Technical elective**		3.0
Free elective		3.0
	Term Credits	13.0

Term 10

CHEM 346	Qualitative Organic Chemistry	5.5
CHEM 493	Senior Research Project	3.0
BIO 404	Structure and Function of Biomolecules	4.0
Free elective		3.0
	Term Credits	15.5

Term 11

CHEM 493	Senior Research Project	3.0
BIO 306	Biochemistry Laboratory	2.0
Liberal Studies electives		6.0
Free electives		6.0
	Term Credits	17.0

Term 12

CHEM 371	Chemistry of Biomolecules	3.0
CHEM 422	Inorganic Chemistry II	3.0
CHEM 425	Inorganic Chemistry Laboratory	4.0
CHEM 493	Senior Research Project	3.0
Free elective		3.0
	Term Credits	16.0

Total Credit: 186.0-190.0

Four-year Non-Co-op

Term 1		**Credits**
CHEM 121	Majors Chemistry I	5.0
BIO 122	Cells and Genetics	4.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121	Calculus I	4.0
UNIV S101	The Drexel Experience	1.0
	Term Credits	17.5

Term 2

CHEM 122	Majors Chemistry II	5.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122	Calculus II	4.0
PHYS 101	Fundamentals of Physics I	4.0
CIVC 101	Introduction to Civic Engagement	1.0
	Term Credits	17.0

Term 3

CHEM 123	Majors Chemistry III	5.5

ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 123	Calculus III	0.0-4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	12.5-16.5

Term 4

CHEM 230*	Quantitative Analysis	4.0
CHEM 231 [WI]*	Quantitative Analysis Laboratory	2.0
CHEM 246	Organic Chemistry for Majors I	6.5
PHYS 201	Fundamentals of Physics III	4.0
	Term Credits	16.5

Term 5

CHEM 248	Organic Chemistry for Majors II	6.5
MATH 200	Multivariate Calculus	4.0
Free electives		6.0
	Term Credits	16.5

Term 6

CHEM 249	Organic Chemistry for Majors III	7.0
MATH 201	Linear Algebra	4.0
BIO 214	Principles of Cell Biology	4.0
Technical elective**		3.0
	Term Credits	18.0

Term 7

CHEM 253	Thermodynamics and Kinetics	4.0
CHEM 421	Inorganic Chemistry I	3.0
CHEM 430	Analytical Chemistry I	3.0
CHEM 367	Chemical Information Retrieval	3.0
UNIV S201	Looking Forward: Academics and Careers	1.0
	Term Credits	14.0

Term 8

CHEM 270	Software Skills for Chemists	3.0
CHEM 357 [WI]	Physical Chemistry Laboratory I	2.5
CHEM 420	Molecular Symmetry and Group Theory Applied Chemistry	3.0
CHEM 431 [WI]	Analytical Chemistry II	4.0
Free elective		3.0
	Term Credits	15.5

Term 9

CHEM 371	Chemistry of Biomolecules	3.0
BIO 311	Biochemistry	4.0
Technical elective**		3.0
Liberal Studies elective		3.0
Free elective		3.0
	Term Credits	16.0

Term 10

CHEM 346	Qualitative Organic Chemistry	5.5
CHEM 493	Senior Research Project	3.0
BIO 404	Structure and Function of Biomolecules	4.0
Free elective		3.0
	Term Credits	15.5

Term 11

CHEM 493	Senior Research Project	3.0
BIO 306	Biochemistry Laboratory	2.0
Liberal Studies elective		3.0
Free electives		6.0
	Term Credits	14.0

Term 12

CHEM 422	Inorganic Chemistry II	3.0
CHEM 425	Inorganic Chemistry Laboratory	4.0
CHEM 493	Senior Research Project	3.0

Free elective		3.0
	Term Credits	13.0

Total Credit: 186.0-190.0

Four-year One Co-op

Term 1

		Credits
CHEM 121	Majors Chemistry I	5.0
BIO 122	Cells and Genetics	4.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121	Calculus I	4.0
UNIV S101	The Drexel Experience	1.0
	Term Credits	17.5

Term 2

CHEM 122	Majors Chemistry II	5.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122	Calculus II	4.0
PHYS 101	Fundamentals of Physics I	4.0
CIVC 101	Introduction to Civic Engagement	1.0
	Term Credits	17.0

Term 3

CHEM 123	Majors Chemistry III	5.5
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 123	Calculus III	0.0-4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	12.5-16.5

Term 4

CHEM 230 [*]	Quantitative Analysis	4.0
CHEM 231 [WI] [*]	Quantitative Analysis Laboratory	2.0
CHEM 246	Organic Chemistry for Majors I	6.5
PHYS 201	Fundamentals of Physics III	4.0
	Term Credits	16.5

Term 5

CHEM 248	Organic Chemistry for Majors II	6.5
MATH 200	Multivariate Calculus	4.0
Free electives		6.0
	Term Credits	16.5

Term 6

CHEM 249	Organic Chemistry for Majors III	7.0
MATH 201	Linear Algebra	4.0
BIO 214	Principles of Cell Biology	4.0
Technical elective [**]		3.0
	Term Credits	18.0

Term 7

Technical elective [**]		3.0
Liberal Studies elective		3.0
Free electives		9.0
	Term Credits	15.0

Term 8

CHEM 253	Thermodynamics and Kinetics	4.0
CHEM 421	Inorganic Chemistry I	3.0
CHEM 430	Analytical Chemistry I	3.0
CHEM 367	Chemical Information Retrieval	3.0
UNIV S201	Looking Forward: Academics and Careers	1.0
	Term Credits	14.0

Term 9

CHEM 270	Software Skills for Chemists	3.0
CHEM 357 [WI]	Physical Chemistry Laboratory I	2.5
CHEM 420	Molecular Symmetry and Group Theory Applied Chemistry	3.0
CHEM 431 [WI]	Analytical Chemistry II	4.0
Free elective		3.0
	Term Credits	15.5

Term 10

CHEM 346	Qualitative Organic Chemistry	5.5
CHEM 493	Senior Research Project	3.0
BIO 311	Biochemistry	4.0
BIO 404	Structure and Function of Biomolecules	4.0
	Term Credits	16.5

Term 11

CHEM 493	Senior Research Project	3.0
BIO 306	Biochemistry Laboratory	2.0
Liberal Studies elective		3.0
Free electives		6.0
	Term Credits	14.0

Term 12

CHEM 371	Chemistry of Biomolecules	3.0
CHEM 422	Inorganic Chemistry II	3.0
CHEM 425	Inorganic Chemistry Laboratory	4.0
CHEM 493	Senior Research Project	3.0
	Term Credits	13.0

Total Credit: 186.0-190.0

[*]   CHEM 230 and CHEM 231 must be taken concurrently.

[**]   Must be at a 200+ level. See Degree Requirements for more information on acceptable classes.

Accelerated Bachelor's/Master's Dual Degree

The Bachelor's/Master's (BS/MS) dual degree program is an accelerated program providing the academically qualified student with an opportunity to earn both a BS and an MS degree (two diplomas are awarded) in five years, the time normally required to finish the co-op option BS degree alone.

This is an academically demanding program, but there are several allowances built in to enable the program to be completed in the time allotted. For instance, only 180 rather than 190.5 undergraduate quarter credits are required. The co-op experience may be adjusted; the student may take two rather than three co-op cycles, enabling two additional quarters of on-campus study. If needed, the student may also take evening courses while on co-op.

Eligibility

Exceptional students with a cumulative grade point average of at least 3.0 and who are enrolled in the five-year co-op option program are eligible for the BS/MS program. Students formally apply to the program after they have completed 90 credits but before they have completed 120 credits. Students are strongly encouraged to begin planning for the program as early as their freshman year. Students who have more than 120 credits are not eligible.

Transfer students are eligible to join the BS/MS program, but they must be able to complete the program in the time it would take to complete the BS degree alone. International transfer students must be able to meet the required minimum TOEFL score for the department graduate program (currently 550) in order to be admitted to the BS/MS program.

Application Process

Interested applicants need to formally apply to the program. Applications are available in the Office of Graduate Admissions or in the College of Arts & Sciences advisor's office. Applications must be accompanied by a Plan of Study prepared in consultation with the undergraduate and graduate advisor in the department and approved by both the Department Head and the Dean. Entry into the program must be officially approved by both the Department Head and Academic Dean.

BS/MS Requirements

Students enrolled in the BS/MS dual degree program must complete 180 undergraduate quarter credits for the BS degree and at least 45 graduate quarter credits for the MS degree. All graduate departmental requirements must be satisfied in full, including producing a thesis, if the thesis-option Master's program is elected. Master's thesis requirements may be completed in the summer term of the final year with prior approval of the department. Students in the BS/MS program must maintain a cumulative GPA of 3.0 in their undergraduate and graduate coursework to remain in the program. Further questions about the BS/MS degree program should be directed to the departmental graduate advisor.

Additional Information

For more information about the major in chemistry, contact:

Daniel King, PhD
Undergraduate Affairs Committee Chair
Department of Chemistry
Drexel University
dk68@drexel.edu

Co-op/Career Opportunities

Opportunities for chemistry majors include working in research and development in corporate and government laboratories in the chemical, pharmaceutical and agricultural (e.g., U.S. Department of Agriculture) sectors. There is a remarkably high concentration of chemical and pharmaceutical companies in the Philadelphia region. Other options include entering medical, dental, law, or other professional schools.

The major in chemistry is sufficiently flexible to allow students to prepare to teach at the secondary level. With proper selection of electives, students can meet teacher certification requirements.

Sample Co-op Opportunities

A five-year co-op degree is offered. When students complete their co-op jobs, they are asked to write an overview of their experiences. These brief quotes are taken from some recent student reports:
Assistant chemist, pharmaceuticals manufacturer: "My position involved the synthesis and characterization of target compounds in the endotheline project. Involved the development of synthetic roots to the prescribed target. This would include the investigation of reactions which were going to be used. . . .the position was very independent. . .great working environment. "

Co-op chemist, petroleum refiner: "Performed synthesis of ligands and metal complexes. Operated FT-IR spectrometer for sample analysis. Submitted samples for analysis by mass spectrometer and NMR. . . .The position allowed me to develop the skills necessary for independent research in organic synthesis. "

Assistant lab technician, pharmaceuticals manufacturer: "I was an assistant technician in a mass spectrometry lab. . . . I was responsible for the development of SDS-gel electrophoresis techniques for gels and gel membranes. . . . I developed the methods independently and my employer encouraged me to be an expert on the technique and explore any method I found that would benefit the lab. "

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Facilities

There are nine undergraduate teaching laboratories in the department: three freshman Chemistry labs, three Organic Chemistry labs, a Physical Chemistry lab, an Analytical Instrumentation Laboratory and a combined Analytical/Inorganic Chemistry lab.

Mass Spectrometry Laboratory
The department maintains a professionally staffed mass spectrometry facility available to all members of the university community. Currently available instrumentation consists of a Waters Autospec M high resolution magnetic-sector mass spectrometer, a Bruker Autoflex III MALDI Time-of-Flight Mass Spectrometer, a Thermo LTQ-FT Fourier Transform Mass Spectrometer, a Sciex API-3000 triple-quadrupole mass spectrometer, and a Varian Saturn 2000 Gas Chromatograph/Ion-trap mass spectrometer system.

Nuclear Magnetic Resonance Laboratory
The professionally staffed Chemistry Department NMR facility is equipped with 300MHz and 500MHz Varian Unity INNOVA NMR systems; both instruments have multi-nuclear capability. The probe on the 500MHz instrument is a cryogenically cooled triple resonance model (1H {13C/15N}) suitable for protein analysis. A Varian X-band 12" EPR spectrometer is also available.

Analytical Instrumentation Laboratory
The open-access departmental Analytical Instrumentation Laboratory includes two Perkin-Elmer (PE) Spectrum One Fourier-transform infrared absorption spectrometers each with a universal diamond ATR accessory, a PE Lambda-35 UV/visible spectrometer, a PE Lambda-950 UV/visible/ NIR spectrometer with a 60-mm-diameter diffuse reflectance integrating sphere, a PE model 343 polarimeter, a PE LS55B luminescence spectrometer, a PE Clarus 500 capillary-column GC with dual FID detectors, a Clarus 500 capillary-column GC/MS system (with electron impact capability), a PE Series 200 Quaternary HPLC development system with UV/visible photodiode array detector, a PE Series 200 binary HPLC system interfaced to a Sciex 2000 triple-quadrupole mass spectrometer, a PE Series 2000 binary Gel Permeation Chromatography system with refractive index detector, and a Varian AA240FS flame atomic absorption spectrometer equipped with a GTA 120 Graphite Furnace Accessory.

Organic Instrumentation Laboratory
The Organic Instrumentation Laboratory (co-located with the organic synthesis teaching laboratories in the Papdakis Integrated Sciences Building) is equipped with two Perkin-Elmer (PE) Spectrum Two Fourier-transform infrared absorption spectrometers each with a universal diamond ATR accessory, a PE Clarus 500 capillary-column GC with one FID and one TCD detector, and an Anasazi EFT-90 FT-NMR system.

Other Departmental Facilities
The department has a VEECO INNOVA N3 Multimode Scanning Probe Microscope and also maintains a computational chemistry laboratory

equipped with nine Dell Optiplex 790 computers running Hyperchem v 8.0. Research laboratories for each of the department faculty members are located in Disque and Stratton Halls. Instrumentation available in the research laboratories is described on individual faculty web pages. Full-time professional support includes two electronic instrument specialists (for NMR and MS- Chemistry Department), two electronics specialists (College of Arts & Sciences Electronics Shop), and four machinists (Drexel University Machine Shop).

Chemistry Faculty

Jason Cross, PhD *(University of Surrey (UK))*. Associate Teaching Professor. Luminescent lanthanide complexes

Fraser Fleming, PhD *(University of British Columbia (Canada)) Department Head, Chemistry*. Professor. Nitriles, Isonitriles, Stereochemistry, Organometallics

Joe P. Foley, PhD *(University of Florida)*. Professor. Separation science, especially the fundamentals and biomedical/pharmaceutical applications of the following voltage- or pressure-driven separation techniques: capillary electrophoresis (CE), electrokinetic chromatography, supercritical fluid chromatography, and high-performance and two-dimensional liquid chromatography (LC). Within these techniques, we explore novel separation modes (e.g., dual-opposite-injection CE and sequential elution LC), novel surfactant aggregate pseudophases, and chiral separations.

Lee Hoffman, PhD *(Flinders University, Adelaide, South Australia)*. Assistant Teaching Professor. Interfacial studies on the self-assembly of natural organic materials, understanding the nature of each component, and development of a mechanism describing this process;Dendrimer/metal nanocomposite design and synthesis hosting metal nanoparticles, utilizing the multivalent dendritic polymer architecture for further exploitation with other molecules such as antibodies and other targeting species.

Monica Ilies, PhD *(Polytechnic University of Bucharest)*. Associate Teaching Professor. Bioorganic chemistry and chemical biology; bioinorganic chemistry and biochemistry.

Haifeng Frank Ji, PhD *(Chinese Academy of Sciences)*. Professor. Micromechancial sensors for biological and environmental applications; Nanomechanical drug screening technology.

Daniel B. King, PhD *(University of Miami)*. Associate Professor. Assessment of active learning methods and technology in chemistry courses; incorporation of environmental data into chemistry classroom modules; development of hands-on activities and laboratory experiments.

Dionicio Martinez-Solario, PhD *(University of Alabama)*. Assistant Professor. Total synthesis of complex biologically active natural products serving as inspirational platforms for the discovery and development of new reactions and synthetic methods.

Craig McClure, PhD *(University of Michigan)*. Associate Teaching Professor. Promotion of quantitative literacy in introductory courses; development of guided inquiry activities for introductory chemistry; outreach programs in STEM fields.

Kevin G. Owens, PhD *(Indiana University)*. Associate Professor. Mass spectrometry research, including the development of sample preparation techniques for quantitative analysis and mass spectrometric imaging using matrix-assisted laser desorption/ionization (MALDI) time-of-flight mass spectrometry (TOFMS) techniques for both biological and synthetic polymer systems, the development of laser spectroscopic techniques for combustion analysis, and the development of correlation analysis and other chemometric techniques for automating the analysis of mass spectral information.

Lynn S. Penn, PhD *(Bryn Mawr College)*. Professor. Surface modification for specific applications: chemically derivatize metal and ceramic solid surfaces; designing and executing sequential chemical processes, building complex and layered structures on surfaces, with specific focus on behavior of polymer brushes (investigating the fundamental transport-selective behavior of polymer brushes because of potential in drug delivery, biomedical devices and as an explanation of some biological processes).

Susan A. Rutkowsky, PhD *(Drexel University) Associate Department Head*. Associate Teaching Professor. Development of labs and lecture demonstrations for general and organic chemistry courses; STEM outreach programs.

Jeremiah Scepaniak, PhD *(New Mexico State University)*. Assistant Professor. Design transition metal-based contrast agents for MRI & synthesis of bimetallic complexes to activate small molecules.

Reinhard Schweitzer-Stenner, PhD *(Universitat Bremen (Germany))*. Professor. Exploring conformational ensembles of unfolded or partially folded peptides and proteins; determining the parameters governing peptide self-aggregation; structure and function of heme proteins; investigating protein-membrane interactions; use of IR, VCD, Raman, NMR and absorption spectroscopy for structure analysis.

Karl Sohlberg, PhD *(University of Delaware)*. Associate Professor. Computational and theoretical materials-related chemistry: (1) complex catalytic materials; (2) mechanical and electrical molecular devices.

Anthony Wambsgans, PhD *(Rice University)*. Associate Teaching Professor.

Ezra Wood Associate Professor. Radical chemistry and formation of secondary pollutants in urban and forest environments, impacts of biomass burning on air pollution and climate change, pollutant emissions, and design and deployment of novel instrumentation for field studies.

Jun Xi, PhD *(Cornell University)*. Associate Teaching Professor. Biomacromolecular interactions both in solution and in confined environment; mechanisms of DNA replication and DNA repair; structure and function of molecular chaperones; drug target identification and new therapeutic development; single molecule enzymology; DNA directed organic synthesis.

Emeritus Faculty

Anthony W. Addison, PhD *(University of Kent at Canterbury, England)*. Professor Emeritus. Design and synthesis of novel biomimetic and oligonuclear chelates of copper, nickel, iron, ruthenium and vanadium; their interpretation by magnetochemical, electrochemical and spectroscopic methods, including electron spin resonance; CD and ESR spectroscopy and kinetics for elucidation of molecular architecture of derivatives (including NO) of oxygen-binding and electron-transfer heme- and non-heme iron metalloproteins of vertebrate and invertebrate origins; energy-transfer by Ru, Ir and lanthanide-containing molecules and assemblies.

Amar Nath, PhD *(Moscow State University, Moscow USSR)*. Professor Emeritus.

Peter A. Wade, PhD *(Purdue University)*. Professor Emeritus. Exploration of a newly discovered [3,3]-sigmatropic rearrangement in which O-allyl nitronic esters are thermally converted to #,#-unsaturated nitro compounds; development and exploitation of a carbon-based hemiacetal mimic; and exploration of cycloaddition reactions involving nitroethylene derivatives and novel nitrile oxides.

Communication

Major: Communication
Degree Awarded: Bachelor of Arts (BA)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 09.0401; 09.0900; 09.0908; 09.9999; 09.0199
Standard Occupational Classification (SOC) code: 11-2011; 11-2031; 27-3022; 27-3041; 27-3042; 27-3043

About the Program

The Department of Communication is committed to helping students become broadly educated and professionally competent communicators. Students are exposed to a variety of media and are guided in the development of their interpretive and expressive skills.

Students may complete the BA in Communication with a concentration in public relations or journalism. Those who want to keep their options open may concentrate in communication.

The Department also offers a Bachelor of Science (BS) in Communication (p. 55).

All communication majors take a common core of courses that emphasize communication theory and methods. Students in the BA program also study a modern language. Students in the public relations concentration take courses and pursue careers in public relations, event planning, media relations, social media, and corporate communication. Journalism students take courses and pursue careers as reporters, copywriters, editors, and media specialists. Students in the communication concentration have the flexibility of crafting their path through the major and thus have career possibilities in any of the areas listed here. Many communication graduates also go on to law school, business school, or graduate school.

Additional Information

If you would like to learn more about the Department of Communication, please visit the Department of Communication website (http://drexel.edu/coas/academics/departments-centers/communication/).

Degree Requirements: Communication Concentration (BA)

Students who select the communication concentration take courses in all of the existing concentrations, as well as other communication courses to prepare them for any communication-related career, or professional post-graduate options.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PSY 101	General Psychology I	3.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Two mathematics courses		6.0-8.0
Two science courses		6.0-8.0
Foreign language courses [*]		8.0-12.0
Humanities and fine arts		12.0
Social sciences		9.0
International studies		6.0
Studies in diversity		6.0
Communication Core Requirements		
Theory Sequence		
COM 101	Human Communication	3.0
COM 150	Mass Media and Society	3.0
COM 210	Theory and Models of Communication	3.0
COM 400	Seminar in Communication	3.0
LING 101	Introduction to Linguistics	3.0
or LING 102	Language and Society	
Methods Sequence		
COM 220	Qualitative Research Methods	3.0
COM 221	Quantitative Research Methods in Communication	3.0
Additional Core Requirements		
COM 222	Interpersonal Communication	3.0
COM 230	Techniques of Speaking	3.0
COM 240	New Technologies In Communication	3.0
COM 247	Social Media in Communication	3.0
COM 491	Senior Project in Communication I	3.0
COM 492	Senior Project in Communication II	3.0
PHIL 305	Ethics and the Media	3.0
Additional Breadth in COM		
COM 160	Introduction to Journalism	3.0
COM 181	Public Relations Principles and Theory	3.0
COM 261	Advanced Journalism	3.0
or COM 282	Public Relations Writing	
COM 310 [WI]	Technical Communication	3.0
Two additional COM classes at 300 level or higher		6.0
Additional Electives		
COM electives		24.0
Free electives		28.0
Total Credits		180.0-188.0

[*] Students must complete at least 8 credits of a foreign language at Drexel and, at minimum, must complete the 103 level of the target language (or beyond if they place higher).

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the

sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study: Communication Concentration (BA)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
COM 101	Human Communication	3.0
COM 150	Mass Media and Society	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
PSY 101	General Psychology I	3.0
UNIV H101	The Drexel Experience	1.0
Foreign language course*		4.0
	Term Credits	17.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
COM 181 or 160	Public Relations Principles and Theory Introduction to Journalism	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
Math course		3.0-4.0
Foreign language course*		4.0
	Term Credits	14.0-15.0
Term 3		
COM 160 or 181	Introduction to Journalism Public Relations Principles and Theory	3.0
COM 230	Techniques of Speaking	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
Humanities elective		3.0
Math course		3.0-4.0
	Term Credits	15.0-16.0
Term 4		
COM 210	Theory and Models of Communication	3.0
COM 222	Interpersonal Communication	3.0
Science course		3.0-4.0
Humanities elective		3.0
Social Science elective		3.0
	Term Credits	15.0-16.0
Term 5		
COM 220	Qualitative Research Methods	3.0

COM 247	Social Media in Communication	3.0
LING 101 or 102	Introduction to Linguistics Language and Society	3.0
Science course		3.0-4.0
COM elective		3.0
	Term Credits	15.0-16.0
Term 6		
COM 221	Quantitative Research Methods in Communication	3.0
COM 261 or 282 [WI]	Advanced Journalism Public Relations Writing	3.0
COM 310 [WI]	Technical Communication	3.0
COM elective		3.0
International or diversity elective		3.0
	Term Credits	15.0
Term 7		
PHIL 305	Ethics and the Media	3.0
COM electives		6.0
Free elective		3.0
International or diversity elective		3.0
	Term Credits	15.0
Term 8		
COM 240	New Technologies In Communication	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Humanities elective		3.0
Free elective		3.0
COM electives		6.0
	Term Credits	16.0
Term 9		
COM elective (above 300 level)		3.0
Free electives		6.0
Social science elective		3.0
International or diversity elective		3.0
	Term Credits	15.0
Term 10		
COM 400	Seminar in Communication	3.0
Communication elective (above 300 level)		3.0
International or diversity elective		3.0
Free electives		7.0
	Term Credits	16.0
Term 11		
COM 491	Senior Project in Communication I	3.0
Communication elective		3.0
Humanities elective		3.0
Social science elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 12		
COM 492	Senior Project in Communication II	3.0
Free electives		6.0
COM elective		3.0
	Term Credits	12.0

Total Credit: 180.0-184.0

*   See degree requirements (p.   ).

Degree Requirements: Journalism Concentration (BA)

Journalism provides students with the skills and theoretical perspective they need to be a journalist in today's swiftly changing media environment. An extension of the program's core curriculum, the concentration hones the student's ability to write, edit, and produce

audiovisual content while at the same time exposing the student to new and evolving aspects of the field.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Requirements

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PSY 101	General Psychology I	3.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Two mathematics courses		6.0-8.0
Two science courses		6.0-8.0
Foreign language courses *		8.0
Humanities and fine arts		12.0
Social sciences		9.0
International studies		6.0
Studies in diversity		6.0
Communication Core Requirements		
Theory Sequence		
COM 101	Human Communication	3.0
COM 150	Mass Media and Society	3.0
COM 210	Theory and Models of Communication	3.0
COM 400	Seminar in Communication	3.0
LING 101	Introduction to Linguistics	3.0
or LING 102	Language and Society	
Methods Sequence		
COM 220	Qualitative Research Methods	3.0
COM 221	Quantitative Research Methods in Communication	3.0
Additional Core Requirements		
COM 222	Interpersonal Communication	3.0
COM 230	Techniques of Speaking	3.0
COM 240	New Technologies In Communication	3.0
COM 247	Social Media in Communication	3.0
COM 491	Senior Project in Communication I	3.0
COM 492	Senior Project in Communication II	3.0
PHIL 305	Ethics and the Media	3.0
Journalism Concentration Requirements		
COM 160	Introduction to Journalism	3.0
COM 181	Public Relations Principles and Theory	3.0
COM 261	Advanced Journalism	3.0
COM 266	Copy Editing for the Media	3.0
COM 315	Investigative Journalism	3.0
COM 365	Journalists, the Courts, and the Law	3.0
TVPR 220	TV News Writing	3.0
Additional Electives		
Communication electives		18.0
Free Electives		31.0
Total Credits		180.0-184.0

*   Students must complete at least 8 credits of a foreign language at Drexel and, at minimum, must complete the 103 level of the target language (or beyond if they place higher).

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study: Journalism Concentration (BA)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
COM 101	Human Communication	3.0
COM 150	Mass Media and Society	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
PSY 101	General Psychology I	3.0
UNIV H101	The Drexel Experience	1.0
Foreign language course *		4.0
	Term Credits	17.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
COM 160	Introduction to Journalism	3.0
Foreign language course *		4.0
Math course		3.0-4.0
	Term Credits	14.0-15.0
Term 3		
COM 181	Public Relations Principles and Theory	3.0
COM 261	Advanced Journalism	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
Math course		3.0-4.0
Humanities elective		3.0
	Term Credits	15.0-16.0
Term 4		
COM 210	Theory and Models of Communication	3.0
COM 222	Interpersonal Communication	3.0
COM 230	Techniques of Speaking	3.0
Humanities elective		3.0

Science course		3.0-4.0
Social science elective		3.0
	Term Credits	18.0-19.0
Term 5		
COM 220	Qualitative Research Methods	3.0
COM 247	Social Media in Communication	3.0
COM 365	Journalists, the Courts, and the Law	3.0
LING 101 or 102	Introduction to Linguistics Language and Society	3.0
Science course		3.0-4.0
Free elective		3.0
	Term Credits	18.0-19.0
Term 6		
COM 221	Quantitative Research Methods in Communication	3.0
TVPR 220	TV News Writing	3.0
International or diversity elective		3.0
Free elective		3.0
	Term Credits	12.0
Term 7		
COM 266	Copy Editing for the Media	3.0
PHIL 305	Ethics and the Media	3.0
COM elective		3.0
International or diversity elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 8		
COM 240	New Technologies In Communication	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
COM elective		3.0
Humanities elective		3.0
Free elective		3.0
	Term Credits	13.0
Term 9		
COM 315	Investigative Journalism	3.0
Free electives		6.0
COM elective		3.0
Social science elective		3.0
	Term Credits	15.0
Term 10		
COM 400	Seminar in Communication	3.0
COM elective		3.0
International or diversity elective		3.0
Free electives		6.0
	Term Credits	15.0
Term 11		
COM 491	Senior Project in Communication I	3.0
COM elective		3.0
Social science elective		3.0
Humanities elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 12		
COM 492	Senior Project in Communication II	3.0
Free elective		4.0
COM elective		3.0
International or diversity elective		3.0
	Term Credits	13.0
Total Credit: 180.0-184.0		

*   See degree requirements (p. 50).

Degree Requirements: Public Relations Concentration (BA)

The concentration in public relations covers a broad range of activities that help an organization and its public communicate with one another. The field includes public relations, media relations, event planning, publication design, employee and customer communication, social media, and government relations.

Skills in this field include written, oral, and visual communication. A public relations specialist might be called on to write articles for an in-house newsletter, to research and write an annual report to shareholders, to publicize a special event, to write a speech for an executive, to plan a press conference, to develop a media plan for an organization, or to script a video for an employee orientation session.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PSY 101	General Psychology I	3.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Two mathematics courses		6.0-8.0
Two science courses		6.0-8.0
Foreign language courses [*]		8.0
Humanities and fine arts		12.0
Social sciences		9.0
International studies		6.0
Studies in diversity electives		6.0
Communication Core Requirements		
Theory Sequence		
COM 101	Human Communication	3.0
COM 150	Mass Media and Society	3.0
COM 210	Theory and Models of Communication	3.0
COM 400	Seminar in Communication	3.0
LING 101	Introduction to Linguistics	3.0
or LING 102	Language and Society	
Methods Sequence		
COM 220	Qualitative Research Methods	3.0
COM 284	Public Relations Research, Measurement and Evaluation	3.0
Additional Core Requirements		
COM 222	Interpersonal Communication	3.0
COM 230	Techniques of Speaking	3.0
COM 240	New Technologies In Communication	3.0
COM 247	Social Media in Communication	3.0
COM 491	Senior Project in Communication I	3.0
COM 492	Senior Project in Communication II	3.0
PHIL 305	Ethics and the Media	3.0
Public Relations Concentration Requirements		
COM 160	Introduction to Journalism	3.0
COM 181	Public Relations Principles and Theory	3.0

COM 282 [WI]	Public Relations Writing	3.0
COM 286	Public Relations Strategies and Tactics	3.0
COM 386	Public Relations Campaign Planning	3.0
MKTG 201	Introduction to Marketing Management	4.0
Select one of the following Visual Communication courses: [**]		3.0
COM 335	Digital Publishing	
COM 340	Desktop Publishing	
Additional Electives		
COM electives		9.0
Free electives		39.0
Total Credits		180.0-184.0

[*] Students must complete at least 8 credits of a foreign language at Drexel and, at minimum, must complete the 103 level of the target language (or beyond if they place higher).

[**] Or other courses as appropriate in COM or the College of Media Arts and Design.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study: Public Relations Concentration (BA)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
COM 101	Human Communication	3.0
COM 150	Mass Media and Society	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
PSY 101	General Psychology I	3.0
UNIV H101 [*]	The Drexel Experience	1.0
Foreign language course [*]		4.0
	Term Credits	17.0
Term 2		
CIVC 101 [*]	Introduction to Civic Engagement	1.0
COM 181	Public Relations Principles and Theory	3.0

ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
Foreign language course [*]		4.0
Math course		3.0-4.0
	Term Credits	14.0-15.0
Term 3		
COM 160	Introduction to Journalism	3.0
COM 230	Techniques of Speaking	3.0
COM 282 [WI]	Public Relations Writing	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
Math course		3.0-4.0
	Term Credits	15.0-16.0
Term 4		
COM 210	Theory and Models of Communication	3.0
COM 222	Interpersonal Communication	3.0
Science elective		3.0-4.0
Humanities elective		3.0
Social science elective		3.0
	Term Credits	15.0-16.0
Term 5		
COM 220	Qualitative Research Methods	3.0
COM 247	Social Media in Communication	3.0
LING 101 or 102	Introduction to Linguistics Language and Society	3.0
Science course		3.0-4.0
Humanities elective		3.0
	Term Credits	15.0-16.0
Term 6		
COM 284	Public Relations Research, Measurement and Evaluation	3.0
International or diversity elective		3.0
Free electives		6.0
social science elective		3.0
	Term Credits	15.0
Term 7		
MKTG 201	Introduction to Marketing Management	4.0
PHIL 305	Ethics and the Media	3.0
International or diversity elective		3.0
Free electives		6.0
	Term Credits	16.0
Term 8		
COM 240	New Technologies In Communication	3.0
COM 286	Public Relations Strategies and Tactics	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Humanities elective		3.0
Free electives		6.0
	Term Credits	16.0
Term 9		
COM 340 or 335 [*]	Desktop Publishing Digital Publishing	3.0
Free electives		6.0
COM elective		3.0
International or diversity elective		3.0
	Term Credits	15.0
Term 10		
COM 386	Public Relations Campaign Planning	3.0
COM 400	Seminar in Communication	3.0
International or diversity elective		3.0
Free electives		6.0
	Term Credits	15.0
Term 11		

COM 491	Senior Project in Communication I	3.0
COM elective		3.0
Social science elective		3.0
Humanities elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 12		
COM 492	Senior Project in Communication II	3.0
COM elective		3.0
Free electives		6.0
	Term Credits	12.0

Total Credit: 180.0-184.0

*   See degree requirements (p.   ).

Co-op/Career Opportunities

Public Relations Concentration

Students with a concentration in public relations find employment in a wide variety of fields, including public relations, advertising, special events planning, writing and editing, and public information. In addition, the strong communication and management skills stressed by this concentration enable students to find positions in management, human resources, marketing, consulting, and publishing.

Although graduate study is not necessary for those who pursue careers in public relations, students have used the major as a basis for graduate work in a variety of areas, including communication, business, and law.

Co-op Experiences in Public Relations

Cooperative education opportunities are available with a variety of corporations and nonprofits in such positions as corporate communication specialist, public relations assistant, and newsletter writer. The following are samples of co-op experiences:

- *Advertising and Promotions Assistant*, CoreStates Bicycle Championships, Philadelphia.
- *Corporate Communications Co-op*, Philadelphia Electric Company, Philadelphia.
- *Advertising/ Promotions Co-op*, U.S. Marketing Division, Mobil Oil Corp., Fairfax, VA.
- *Assistant Coordinator*, Communications Bureau, United Way of Southeastern Pennsylvania, Philadelphia.

Journalism Concentration

Journalism students pursue careers in journalism, broadcast media, and news. Given the rapidly changing nature of these fields, graduates may also find work in new types of publishing platforms, such as social media or mobile, or involving audiovisual content creation. Journalism graduates may also choose to pursue graduate study, whether in journalism or another discipline.

Co-op Experiences in Journalism

Journalism students have held co-ops with a number of media, news, and information companies, including the following:

- *Production assistant*, WPVI-TV (Channel 6) Philadelphia
- *Staff writer*, Delaware County Daily Times

- *Promotions department*, WPLY-FM (Y-100)
- *Production assistant*, sports department, FOX-29 (WTFX-TV)

Technical and Science Communication Concentration

Students who study technical and science communication are prepared for a variety of career options. Many students become technical writers and editors who produce manuals and reports about high-technology products and services. Students may also go on to write specifications and in-house organs for business, industry, and government. Other students conduct and interpret surveys for business. In addition, this program is excellent preparation for graduate study in a number of fields, such as law and medicine.

Co-op Experiences in Technical and Science Communication

Communication students have worked for corporations and nonprofit organizations. The following are some samples of past co-op experiences:

- *Technical writer*, Unisys Corp. and Hewlett Packard
- *Web page writer*, Hospital of the University of Pennsylvania
- *Pharmaceutical writer*, GlaxoSmithKline
- *Medical writer*, Medcases Corp.

Communication Concentration

Students in the communication concentration develop a focus that fits their interests in the field of communication and will thus be ready for a variety of career options that require strong writing and research skills, as well as graduate or professional school.

Co-op Experiences in Communication

Students in this concentration can choose from the variety of co-op opportunities open to any student in communication.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Communication Faculty

Ronald Bishop, III, PhD *(Temple University) Director, Undergraduate Programs in Communication.* Professor. Investigative reporting, sports journalism, journalism history, journalism sourcing patterns, textual narrative and ideological analysis, cultural history of fame.

Joan W. Blumberg, BA *(Pennsylvania State University).* Assistant Teaching Professor. Publishing, electronic publishing, publishing and communications, publishing and mass-media.

Karen Cristiano, MS *(Temple University) Assistant Department Head of Communication.* Teaching Professor. Journalism, medical writing, feature writing, copy editing, mass media and society.

Richard Forney Assistant Teaching Professor. Broadcast journalism technology and the effects of new technologies on personal and corporate communication skills.

Alexander Friedlander, PhD *(Carnegie Mellon University) Associate Dean for Undergraduate Education, College of Arts and Sciences; Interim Co-*

Director, Judaic Studies Program. Associate Professor. Rhetorical theory and practice, document design, writing and technology.

Ernest A. Hakanen, PhD *(Temple University) Director, Graduate Programs in Communication, Culture & Media.* Professor. Telecommunications policy, adolescent media use, communication theory and history, global media, and semiotics.

Barbara Hoekje, PhD *(University of Pennsylvania).* Associate Professor. Sociolinguistic theory, discourse analysis, applied linguistics (language teaching, learning, and testing).

Alexander Jenkins, PhD *(Drexel University).* Assistant Teaching Professor. Digital games, video games, emotion, morality, online fan communities, emerging media, convergence.

Hyunmin Lee, PhD *(University of Missouri) Director, Undergraduate Programs in Communication.* Associate Professor. Social media strategies for relationship and reputation management in public relations; media messages of public health issues and its psychological and behavioral effects on the public.

Susan Magee, MFA *Director Online Teaching.* Instructor. Digital Publishing, Content reation, Blogging, Strategic Social Media, Public Relations, Business and Technical Communication

Julia May, PhD *(Drexel University) Director, Professional MS Communication Programs.* Assistant Teaching Professor. Political communication; international politics and its news coverage; public opinion; transatlantic relations; war, torture and human rights; debate in the public sphere.

Alexander Nikolaev, PhD *(Florida State University).* Associate Professor. Public relations, political communication, organizational communication, mass communication, international communications and negotiations, communications theory.

Rakhmiel Peltz, PhD *(University of Pennsylvania).* Professor. Judaic studies, Yiddish culture and linguistics, ethnography of communication, immigrant cultural studies.

Douglas V. Porpora, PhD *(Temple University).* Professor. War, genocide, torture, and human rights; macro-moral reasoning in public sphere debate; contemporary social theory moral and political communication; religion.

Rachel R. Reynolds, PhD *(University of Illinois).* Associate Professor. Sociolinguistics, ethnography of communication and discourse analysis; violence against women in mass media; political economy of migration; semiotics including the textual, the visual and multimodal.

Rosemary Rys, MA *(Rowan University).* Assistant Teaching Professor. Public relations and marketing.

Wesley Shumar, PhD *(University of Pennsylvania).* Professor. Digital media and learning; culture of higher education; entrepreneurship education; craft culture; semiotic of consumer culture.

Lawrence Souder, PhD *(Temple University) Director, Drexel Edits.* Teaching Professor. Science and technical writing, communication ethics, nonprofit communication.

Allan Stegeman, MA *(University of Houston).* Teaching Professor. Communication, technology and mass media, video.

Susan Stein, PhD *(University of Wisconsin).* Associate Teaching Professor. Science, environmental, and health communication

Scott Tattar, BA *(York College of Pennsylvania) Faculty Advisor, Drexel PRSSA, Communication Department Recruitment Liason.* Instructor. Public relations

Hilde Van den Bulck, PhD *(Katholieke Universiteit Leuven) Department Head of Communication.* Professor. Political economy of media structures; media policies for digitized media ecologies; stakeholders and coalitions in media policies; digitization; convergence and legacy media; public (service) media; celebrity culture and industry; fandom and anti-fandom.

Asta Zelenkauskaite, PhD *(Indiana University).* Associate Professor. Social media; user-generated content; computer-mediated communication; interactivity; active audience analysis; mobile communication; gender and online identity; prosumer culture; internet of things; quantitative/qualitative research.

Communication

Major: Communication
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 09.0401; 09.0900; 09.0908; 09.9999; 09.0199
Standard Occupational Classification (SOC) code: 11-2011; 11-2031; 27-3022; 27-3041; 27-3042; 27-3043

About the Program

The Department of Communication is committed to helping students become broadly educated and professionally competent communicators. Students are exposed to a variety of media and are guided in the development of their interpretive and expressive skills.

Students may complete the BS in Communication with a concentration in public relations or technical and science communication. Those who want to keep their options open may concentrate in communication.

The Department also offers a Bachelor of Arts (BA) in Communication (p. 49).

All communication majors take a common core of courses that emphasize communication theory and methods. Students in the BS program take a lab science sequence and a math analysis sequence, which includes some calculus. Students in the public relations concentration take courses and pursue careers in public relations, event planning, media relations, social media, and corporate communication. Those who choose the technical and science communication concentration go on to work in technical writing, science writing, publishing, and software and hardware documentation. Students in the communication concentration have the flexibility of crafting their path through the major and thus have career possibilities in any of the areas listed here. Many communication graduates also go on to law school, business school, or graduate school.

Additional Information

If you would like to learn more about the Department of Communication, please visit the Department of Communication website (http://drexel.edu/coas/academics/departments-centers/communication/).

Degree Requirements: Communication Concentration (BS)

Students who select the communication concentration take courses in all of the existing concentrations, as well as other communication courses to prepare them for any communication-related career, or professional post-graduate options.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Requirements		
CIVC 101	Introduction to Civic Engagement [*]	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PSY 101	General Psychology I	3.0
UNIV H101	The Drexel Experience [*]	1.0
UNIV H201	Looking Forward: Academics and Careers [*]	1.0
Humanities and fine arts		12.0
Social sciences		9.0
International studies		6.0
Studies in diversity		6.0
Select one of the following Science Sequences:		**8.0**
Biology Sequence		
BIO 107	Cells, Genetics & Physiology	
BIO 108	Cells, Genetics and Physiology Laboratory	
BIO 109	Biological Diversity, Ecology & Evolution	
BIO 110	Biological Diversity, Ecology and Evolution Laboratory	
Chemistry Sequence		
CHEM 111	General Chemistry I	
CHEM 112	General Chemistry II	
Physics Sequence		
PHYS 103	General Physics I	
PHYS 104	General Physics II	
Select one of the following Mathematics Sequences:		**8.0**
Analysis Sequence		
MATH 101	Introduction to Analysis I	
MATH 102	Introduction to Analysis II	
Calculus Sequence		
MATH 121	Calculus I	
MATH 122	Calculus II	
Communication Core Requirements		
Theory Sequence		
COM 101	Human Communication	3.0
COM 150	Mass Media and Society	3.0
COM 210	Theory and Models of Communication	3.0
COM 400	Seminar in Communication	3.0
LING 101	Introduction to Linguistics	3.0
or LING 102	Language and Society	
Methods Sequence		

COM 220	Qualitative Research Methods	3.0
COM 221	Quantitative Research Methods in Communication	3.0
Additional Core Requirements		
COM 222	Interpersonal Communication	3.0
COM 230	Techniques of Speaking	3.0
COM 240	New Technologies In Communication	3.0
COM 247	Social Media in Communication	3.0
COM 491	Senior Project in Communication I	3.0
COM 492	Senior Project in Communication II	3.0
PHIL 305	Ethics and the Media	3.0
Additional Breadth in COM		
COM 160	Introduction to Journalism	3.0
COM 181	Public Relations Principles and Theory	3.0
COM 261	Advanced Journalism	3.0
or COM 282	Public Relations Writing	
COM 310 [WI]	Technical Communication	3.0
Two additional COM classes at 300 level or higher		6.0
Additional Electives		
COM electives		28.0
Free electives		28.0
Total Credits		180.0

[*]   Students taking this program online are not required to take CIVC 101, UNIV H101, or UNIV H201. Instead, online students are required to take AS-I 101 *Strategies for Online Learning* for 3.0 credits.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study: Communication Concentration (BS)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
COM 101	Human Communication	3.0
COM 150	Mass Media and Society	3.0

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or 111	English Composition I	
PSY 101	General Psychology I	3.0
UNIV H101	The Drexel Experience	1.0
Math sequence course 1*		4.0
	Term Credits	17.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or 112	English Composition II	
COM 181	Public Relations Principles and Theory	3.0
or 160	Introduction to Journalism	
Math sequence course 2*		4.0
Social science elective		3.0
	Term Credits	14.0
Term 3		
COM 160	Introduction to Journalism	3.0
or 181	Public Relations Principles and Theory	
COM 230	Techniques of Speaking	3.0
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or 113	English Composition III	
Humanities elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 4		
COM 210	Theory and Models of Communication	3.0
COM 222	Interpersonal Communication	3.0
Science sequence course 1*		4.0
Free elective		4.0
Humanities elective		3.0
	Term Credits	17.0
Term 5		
COM 220	Qualitative Research Methods	3.0
COM 247	Social Media in Communication	3.0
LING 101	Introduction to Linguistics	3.0
or 102	Language and Society	
Science sequence course 2*		4.0
COM elective		3.0
	Term Credits	16.0
Term 6		
COM 221	Quantitative Research Methods in Communication	3.0
COM 261	Advanced Journalism	3.0
or 282 [WI]	Public Relations Writing	
COM 310 [WI]	Technical Communication	3.0
COM elective		3.0
Free elective		3.0
International or diversity elective		3.0
	Term Credits	18.0
Term 7		
PHIL 305	Ethics and the Media	3.0
COM electives		6.0
Free elective		3.0
International or diversity elective		3.0
	Term Credits	15.0
Term 8		
COM 240	New Technologies In Communication	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
COM electives		6.0
Humanities elective		3.0
Free elective		3.0
	Term Credits	16.0
Term 9		

COM elective (above 300 level)		3.0
Free elective		3.0
Social science elective		3.0
International or diversity elective		3.0
	Term Credits	12.0
Term 10		
COM 400	Seminar in Communication	3.0
Communication elective (above 300 level)		3.0
International or diversity elective		3.0
Free elective		3.0
	Term Credits	12.0
Term 11		
COM 491	Senior Project in Communication I	3.0
COM elective		3.0
Humanities elective		3.0
Social science elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 12		
COM 492	Senior Project in Communication II	3.0
COM electives		7.0
Free elective		3.0
	Term Credits	13.0

Total Credit: 180.0

*   See degree requirements (p.   ).

Degree Requirements: Public Relations Concentration (BS)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Requirements

CIVC 101	Introduction to Civic Engagement *	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PSY 101	General Psychology I	3.0
UNIV H101	The Drexel Experience *	1.0
UNIV H201	Looking Forward: Academics and Careers *	1.0
Humanities and fine arts		12.0
Social sciences		9.0
International studies		6.0
Studies in diversity		6.0
Select one of the following Science Sequences:		**8.0**
Biology Sequence		
BIO 107	Cells, Genetics & Physiology	
BIO 108	Cells, Genetics and Physiology Laboratory	
BIO 109	Biological Diversity, Ecology & Evolution	
BIO 110	Biological Diversity, Ecology and Evolution Laboratory	
Chemistry Sequence		
CHEM 111	General Chemistry I	
CHEM 112	General Chemistry II	
Physics Sequence		
PHYS 103	General Physics I	

PHYS 104	General Physics II	
Select one of the following Mathematics Sequences		**8.0**
Analysis Sequence		
MATH 101	Introduction to Analysis I	
MATH 102	Introduction to Analysis II	
Calculus Sequence		
MATH 121	Calculus I	
MATH 122	Calculus II	
Communication Core Requirements		
Theory Sequence		
COM 101	Human Communication	3.0
COM 150	Mass Media and Society	3.0
COM 210	Theory and Models of Communication	3.0
COM 400	Seminar in Communication	3.0
LING 101	Introduction to Linguistics	3.0
or LING 102	Language and Society	
Methods Sequence		
COM 220	Qualitative Research Methods	3.0
COM 284	Public Relations Research, Measurement and Evaluation	3.0
Additional Core Requirements		
COM 222	Interpersonal Communication	3.0
COM 230	Techniques of Speaking	3.0
COM 240	New Technologies In Communication	3.0
COM 247	Social Media in Communication	3.0
COM 491	Senior Project in Communication I	3.0
COM 492	Senior Project in Communication II	3.0
PHIL 305	Ethics and the Media	3.0
Public Relations Concentration Requirements		
COM 160	Introduction to Journalism	3.0
COM 181	Public Relations Principles and Theory	3.0
COM 282 [WI]	Public Relations Writing	3.0
COM 286	Public Relations Strategies and Tactics	3.0
COM 386	Public Relations Campaign Planning	3.0
MKTG 201	Introduction to Marketing Management	4.0
Visual Communication Courses **		
COM 335	Digital Publishing	3.0
or COM 340	Desktop Publishing	
Additional Electives		
COM electives		9.0
Free electives		43.0
Total Credits		180.0

* Students taking this program online are not required to take UNIV H101, UNIV H201 or CIVC 101. Instead, online students are required to take "Strategies for Online Learning" for 3 credits.

** Or other courses as appropriate in COM or the College of Media Arts and Design.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Degree Requirements: Public Relations Concentration (BS)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
COM 101	Human Communication	3.0
COM 150	Mass Media and Society	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or 111	English Composition I	
PSY 101	General Psychology I	3.0
UNIV H101*	The Drexel Experience	1.0
Math sequence course 1*		4.0
	Term Credits	17.0
Term 2		
COM 181	Public Relations Principles and Theory	3.0
CIVC 101*	Introduction to Civic Engagement	1.0
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or 112	English Composition II	
Math sequence course 2*		4.0
Humanities elective		3.0
	Term Credits	14.0
Term 3		
COM 160	Introduction to Journalism	3.0
COM 230	Techniques of Speaking	3.0
COM 282 [WI]	Public Relations Writing	3.0
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or 113	English Composition III	
International or diversity elective		3.0
	Term Credits	15.0
Term 4		
COM 210	Theory and Models of Communication	3.0
COM 222	Interpersonal Communication	3.0
Science sequence course 1*		4.0
Humanities elective		3.0
Social science elective		3.0
	Term Credits	16.0
Term 5		
COM 220	Qualitative Research Methods	3.0
COM 247	Social Media in Communication	3.0
LING 101	Introduction to Linguistics	3.0
or 102	Language and Society	
Science sequence course 2*		4.0
Social science elective		3.0
	Term Credits	16.0
Term 6		
COM 284	Public Relations Research, Measurement and Evaluation	3.0
International or diversity elective		3.0

Free electives		9.0
	Term Credits	15.0
Term 7		
MKTG 201	Introduction to Marketing Management	4.0
PHIL 305	Ethics and the Media	3.0
International or diversity elective		3.0
Free electives		6.0
	Term Credits	16.0
Term 8		
COM 240	New Technologies In Communication	3.0
COM 286	Public Relations Strategies and Tactics	3.0
UNIV H201[*]	Looking Forward: Academics and Careers	1.0
Humanities elective		3.0
Free electives		6.0
	Term Credits	16.0
Term 9		
COM 335 or 340[*]	Digital Publishing Desktop Publishing	3.0
Free electives		6.0
Social science elective		3.0
COM elective		3.0
	Term Credits	15.0
Term 10		
COM 386	Public Relations Campaign Planning	3.0
COM 400	Seminar in Communication	3.0
Humanities elective		3.0
Free electives		6.0
	Term Credits	15.0
Term 11		
COM 491	Senior Project in Communication I	3.0
COM elective		3.0
Free electives		6.0
	Term Credits	12.0
Term 12		
COM 492	Senior Project in Communication II	3.0
International or diversity elective		3.0
COM elective		3.0
Free elective		4.0
	Term Credits	13.0

Total Credit: 180.0

[*] See degree requirements (p.   ).

Degree Requirements: Technical and Science Communication Concentration (BS)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Requirements

CIVC 101	Introduction to Civic Engagement [*]	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PSY 101	General Psychology I	3.0
UNIV H101	The Drexel Experience [*]	1.0
UNIV H201	Looking Forward: Academics and Careers [*]	1.0
Social sciences		9.0
Humanities and fine arts		9.0
International studies		6.0
Studies in diversity		6.0
One of the following Science sequences:		**8.0**
Biology Sequence		
BIO 107	Cells, Genetics & Physiology	
BIO 108	Cells, Genetics and Physiology Laboratory	
BIO 109	Biological Diversity, Ecology & Evolution	
BIO 110	Biological Diversity, Ecology and Evolution Laboratory	
Chemistry Sequence		
CHEM 111	General Chemistry I	
CHEM 112	General Chemistry II	
Physics Sequence		
PHYS 103	General Physics I	
PHYS 104	General Physics II	
One of the following Math sequences:		**8.0**
Analysis Sequence		
MATH 101	Introduction to Analysis I	
MATH 102	Introduction to Analysis II	
Calculus Sequence		
MATH 121	Calculus I	
MATH 122	Calculus II	
Communication Core Requirements		
Theory Sequence		
COM 101	Human Communication	3.0
COM 150	Mass Media and Society	3.0
COM 210	Theory and Models of Communication	3.0
COM 400	Seminar in Communication	3.0
LING 101	Introduction to Linguistics	3.0
or LING 102	Language and Society	
Methods Sequence		
COM 220	Qualitative Research Methods	3.0
COM 221	Quantitative Research Methods in Communication	3.0
Additional Core Requirements		
COM 222	Interpersonal Communication	3.0
COM 230	Techniques of Speaking	3.0
COM 240	New Technologies In Communication	3.0
COM 247	Social Media in Communication	3.0
COM 491	Senior Project in Communication I	3.0
COM 492	Senior Project in Communication II	3.0
PHIL 305	Ethics and the Media	3.0
Technical and Science Concentration Requirements		
COM 160	Introduction to Journalism	3.0
COM 181	Public Relations Principles and Theory	3.0
COM 310 [WI]	Technical Communication	3.0
COM 320 [WI]	Science Writing	3.0
COM 335	Digital Publishing	3.0
COM 350 [WI]	Document Design and Evaluation	3.0
COM 420	Technical, Science and Health Editing	3.0
Technology, Science & Communication Breadth		
Select three of the following:		9.0
COM 316	Campaigns for Health & Environment	
COM 317 [WI]	Environmental Communication	
COM 318	Film, Celebrity and the Environmental Movement	
COM 330	Professional Presentations	
COM 340	Desktop Publishing	
COM 345	Intercultural Communication	
COM 351	Computer Mediated Communication	
COM 355	Ethnography of Communication	

COM 384	Free Speech & Censorship	
COM 385	Media Effects	
Multidisciplinary Breadth		
Select three of the following:		9.0
ANTH 355	Digital Culture	
ENGL 300 [WI]	Literature & Science	
ENGL 302	Environmental Literature	
HIST 285	Technology in Historical Perspective	
INFO 101	Introduction to Computing and Security Technology	
INFO 105	Introduction to Informatics	
INFO 108	Foundations of Software	
INFO 110	Introduction to Human-Computer Interaction	
PHIL 361	Philosophy of Science	
PSY 330	Cognitive Psychology	
PSY 332	Human Factors and Cognitive Engineering	
PSY 337	Human-Computer Interaction	
Additional Electives		
COM electives		15.0
Free electives		23.0
Total Credits		180.0

* Students taking this program online are not required to take UNIV H101,UNIV H201 or CIVC 101. Instead, online students are required to take "Strategies for Online Learning" for 3 credits.

Degree Requirements: Technical and Science Communication Concentration (BS)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Technical and Science Communication (BS)

Term 1		**Credits**
COM 101	Human Communication	3.0
COM 150	Mass Media and Society	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
PSY 101	General Psychology I	3.0
UNIV H101*	The Drexel Experience	1.0
Math sequence course 1*		4.0
	Term Credits	17.0
Term 2		
COM 160	Introduction to Journalism	3.0
CIVC 101*	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
Math sequence course 2*		4.0
Social science elective		3.0
	Term Credits	14.0
Term 3		
COM 181	Public Relations Principles and Theory	3.0
COM 230	Techniques of Speaking	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
Humanities elective		3.0
Social science elective		3.0
	Term Credits	15.0

Term 4		
COM 210	Theory and Models of Communication	3.0
COM 222	Interpersonal Communication	3.0
Science sequence course 1*		4.0
Multidisciplinary elective		3.0
Humanities elective		3.0
	Term Credits	16.0
Term 5		
COM 220	Qualitative Research Methods	3.0
COM 247	Social Media in Communication	3.0
LING 101 or 102	Introduction to Linguistics Language and Society	3.0
Science sequence course 2*		4.0
Technology, science and communication elective		3.0
	Term Credits	16.0
Term 6		
COM 221	Quantitative Research Methods in Communication	3.0
COM 310 [WI]	Technical Communication	3.0
Free elective		4.0
Multidisiplinary elective		3.0
International or diversity elective		3.0
	Term Credits	16.0
Term 7		
COM 335	Digital Publishing	3.0
PHIL 305	Ethics and the Media	3.0
COM elective		3.0
International or diversity elective		3.0
Technology, science, and communication elective		3.0
	Term Credits	15.0
Term 8		
COM 240	New Technologies In Communication	3.0
UNIV H201*	Looking Forward: Academics and Careers	1.0
Technology, science, and communication elective		3.0
Free elective		3.0
Humanities elective		3.0
COM elective		3.0
	Term Credits	16.0
Term 9		
COM 320 [WI]	Science Writing	3.0
COM 350 [WI]	Document Design and Evaluation	3.0
COM elective		3.0
Free electives		6.0
	Term Credits	15.0
Term 10		
COM 400	Seminar in Communication	3.0
COM 420	Technical, Science and Health Editing	3.0
International or diversity elective		3.0
Free electives		6.0
	Term Credits	15.0
Term 11		
COM 491	Senior Project in Communication I	3.0
COM elective		3.0
Multidisciplinary elective		3.0
Social science elective		3.0
	Term Credits	12.0
Term 12		
COM 492	Senior Project in Communication II	3.0
International or diversity elective		3.0
COM elective		3.0

Free elective	4.0
Term Credits	13.0

Total Credit: 180.0

* See degree requirements (p.   ).

Communication Faculty

Ronald Bishop, III, PhD *(Temple University) Director, Undergraduate Programs in Communication*. Professor. Investigative reporting, sports journalism, journalism history, journalism sourcing patterns, textual narrative and ideological analysis, cultural history of fame.

Joan W. Blumberg, BA *(Pennsylvania State University)*. Assistant Teaching Professor. Publishing, electronic publishing, publishing and communications, publishing and mass-media.

Karen Cristiano, MS *(Temple University) Assistant Department Head of Communication*. Teaching Professor. Journalism, medical writing, feature writing, copy editing, mass media and society.

Richard Forney Assistant Teaching Professor. Broadcast journalism technology and the effects of new technologies on personal and corporate communication skills.

Alexander Friedlander, PhD *(Carnegie Mellon University) Associate Dean for Undergraduate Education, College of Arts and Sciences; Interim Co-Director, Judaic Studies Program*. Associate Professor. Rhetorical theory and practice, document design, writing and technology.

Ernest A. Hakanen, PhD *(Temple University) Director, Graduate Programs in Communication, Culture & Media*. Professor. Telecommunications policy, adolescent media use, communication theory and history, global media, and semiotics.

Barbara Hoekje, PhD *(University of Pennsylvania)*. Associate Professor. Sociolinguistic theory, discourse analysis, applied linguistics (language teaching, learning, and testing).

Alexander Jenkins, PhD *(Drexel University)*. Assistant Teaching Professor. Digital games, video games, emotion, morality, online fan communities, emerging media, convergence.

Hyunmin Lee, PhD *(University of Missouri) Director, Undergraduate Programs in Communication*. Associate Professor. Social media strategies for relationship and reputation management in public relations; media messages of public health issues and its psychological and behavioral effects on the public.

Susan Magee, MFA *Director Online Teaching*. Instructor. Digital Publishing, Content reation, Blogging, Strategic Social Media, Public Relations, Business and Technical Communication

Julia May, PhD *(Drexel University) Director, Professional MS Communication Programs*. Assistant Teaching Professor. Political communication; international politics and its news coverage; public opinion; transatlantic relations; war, torture and human rights; debate in the public sphere.

Alexander Nikolaev, PhD *(Florida State University)*. Associate Professor. Public relations, political communication, organizational communication, mass communication, international communications and negotiations, communications theory.

Rakhmiel Peltz, PhD *(University of Pennsylvania)*. Professor. Judaic studies, Yiddish culture and linguistics, ethnography of communication, immigrant cultural studies.

Douglas V. Porpora, PhD *(Temple University)*. Professor. War, genocide, torture, and human rights; macro-moral reasoning in public sphere debate; contemporary social theory moral and political communication; religion.

Rachel R. Reynolds, PhD *(University of Illinois)*. Associate Professor. Sociolinguistics, ethnography of communication and discourse analysis; violence against women in mass media; political economy of migration; semiotics including the textual, the visual and multimodal.

Rosemary Rys, MA *(Rowan University)*. Assistant Teaching Professor. Public relations and marketing.

Wesley Shumar, PhD *(University of Pennsylvania)*. Professor. Digital media and learning; culture of higher education; entrepreneurship education; craft culture; semiotic of consumer culture.

Lawrence Souder, PhD *(Temple University) Director, Drexel Edits*. Teaching Professor. Science and technical writing, communication ethics, nonprofit communication.

Allan Stegeman, MA *(University of Houston)*. Teaching Professor. Communication, technology and mass media, video.

Susan Stein, PhD *(University of Wisconsin)*. Associate Teaching Professor. Science, environmental, and health communication

Scott Tattar, BA *(York College of Pennsylvania) Faculty Advisor, Drexel PRSSA, Communication Department Recruitment Liason*. Instructor. Public relations

Hilde Van den Bulck, PhD *(Katholieke Universiteit Leuven) Department Head of Communication*. Professor. Political economy of media structures; media policies for digitized media ecologies; stakeholders and coalitions in media policies; digitization; convergence and legacy media; public (service) media; celebrity culture and industry; fandom and anti-fandom.

Asta Zelenkauskaite, PhD *(Indiana University)*. Associate Professor. Social media; user-generated content; computer-mediated communication; interactivity; active audience analysis; mobile communication; gender and online identity; prosumer culture; internet of things; quantitative/qualitative research.

Criminology and Justice Studies

About the Department

In what ways did the War on Drugs of the 1980s and 1990s impact urban communities in terms of street-corner dealing, violence, and overall health? What about national incarceration rates, and racial disparities in the adjudication process? How far will the War on Terrorism push the legal boundaries of government surveillance and the monitoring of electronic communications, and what will be the impacts of such forces? In what ways are "big data" being used (now and in the future) by justice, intelligence, or private organizations to identify social networks, conduct risk assessments, and make decisions about crime policy and resource deployment? Finally, what are the intersections among public health, community violence, criminal justice interventions, and housing and education policy?

Drexel University's degree programs in Criminology and Justice Studies offer a rich educational experience that emphasizes justice and criminological theory, the use of analytical tools and data to answer big questions about crime and justice while teaching students how to translate conceptual knowledge into state of the art practice. Along the way, the Department of Criminology and Justice Studies offers global educational opportunities with two courses taught abroad, a set of community-based courses that take students beyond the classroom to practice the learning process, as well as an urban educational experience in one of the premier cities in the country. With its three thematic concentrations -- Criminology and Justice Policy, Justice Informatics, and Criminal Justice -- the Department of Criminology and Justice Studies offers students many pathways through which to explore a curriculum that emphasizes innovative learning opportunities, global and civic engagement, and a culture that fosters student successes and well being.

Please click the links below to explore the degree concentrations in Criminology and Justice Studies.

Degree Concentrations

- Criminology & Justice Policy (p. 62)
- Justice Informatics (p. 65)
- Criminal Justice

Criminology and Justice Studies Faculty

Robert D'Ovidio, PhD *(Temple University)*. Associate Professor. The intersection of computer technology, crime and the criminal justice system, criminological theory, policing, transnational crime.

Ashley Dickinson, PhD *(Indiana University of Pennsylvania)*. Assistant Teaching Professor. Corrections; offender rehabilitation; risk management; offender classification; gender and crime.

Jordan Hyatt, PhD, JD *(University of Pennsylvania, Villanova University School of Law)*. Associate Professor. Community corrections; drug treatment; homelessness; probation/parole; re-entry; risk assessment; sentencing.

Shannon Jacobsen, PhD *(Rutgers University)*. Assistant Professor. Gender, crime and victimization, fear of crimes and perceptions of risk, campus crime, public safety, communications and crime, social inequities, mixed methods research

Robert J. Kane, PhD *(Temple University) Department Head*. Professor. Police authority and accountability; urban ecology and sociology; violence and public health; police strategies and practices.

Kathleen Powell, PhD *(Rutgers University)*. Post-Doctoral Fellow. Collateral consequences of incarceration, juvenile justice, quasi-experimental research design.

Cyndi Rickards, EdD *(Drexel University)*. Assistant Teaching Professor. On-line pedagogy; service-learning pedagogy; juvenile justice; domestic violence.

Kristene Unsworth, PhD *(University of Washington)*. Assistant Teaching Professor. Information science, policy and ethics, critical discourse analysis and qualitative methodology.

Criminology and Justice Studies

Major: Criminology and Justice Studies

Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 182.0
Co-op Options: One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 45.0401
Standard Occupational Classification (SOC) code: 11-9199

Criminology and Justice Policy concentration

About the Program

The Criminology & Justice Policy (C&JP) concentration grounds students in criminological theory and crime policy, as well as justice analytics, to help them identify, describe, and respond to current and emerging crime and security problems. A key goal of any rational crime policy is to maximize its benefits — e.g., reducing crime — while limiting its social costs, such as mass-incarceration, racial disparities, and violent backlashes. Through that lens, C&JP students will learn to map crime, calls for service, and social media posts. They will use a Geographic Information System to identify and explain crime trends, "hotspots," and "coldspots" across given geographies; and they will put their theory to use as they learn to generate and test research hypotheses related to crime and justice policy outcomes. Moreover, through community-based learning (a core value of the program), C&JP offers students the unique opportunity to experience criminology and justice education from the perspectives of those most affected by the criminal justice system: One required course is taught in an active jail; another is taught in a local community service organization.

Finally, recognizing the global nature of crime and justice issues, C&JP requires one course on international justice systems, two globally-themed courses outside the program; and it encourages all students to participate in at least one faculty-led study abroad program during which students will explore various justice-related themes (examples of recent trips: *The Legacy of Nazi Policing and Cold War Justice in Munich and Prague;* and *Crime and Justice in Scandinavia* . Please see the Study Abroad Program (https://studyabroad.drexel.edu/?FuseAction=Programs.ListAll) web page to view the location and itinerary of the 2019 study tour.). The emphasis on comparative justice and study abroad reside at the leading edge of Drexel's core value of global citizenship.

The Criminology & Justice Policy thematic concentration reserves 31.0 credits of free electives so that students can earn a minor outside the Program in Criminology and Justice Studies. Students interested in intelligence/security-related careers should consider minoring in a language. Visit Drexel's Modern Languages Program (http://www.drexel.edu/coas/academics/departments-centers/global-studies-modern-languages/degrees-programs/modern-languages/) web page for a list of language minors.

Additional Information

For more information about the Criminology & Justice Policy concentration, please contact:

Robert Kane, PhD
Professor and Department Head
Department of Criminology and Justice Studies
robert.j.kane@drexel.edu

Criminology and Justice Policy concentration

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Degree Requirements

General Degree Requirements

ANTH 101	Introduction to Cultural Diversity	3.0
CIVC 101	Introduction to Civic Engagement	1.0
COM 150	Mass Media and Society	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 101	Introduction to Western Philosophy	3.0
PSCI 100	Introduction to Political Science	4.0
PSY 101	General Psychology I	3.0
SOC 101	Introduction to Sociology	3.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
English Elective (any ENGL course over 200-level)		3.0
Fine Arts Elective		3.0
History Elective		4.0

Math Sequence

Take any two Math courses		6.0-8.0

Science Sequence

Take any two Science courses with a lab from any combination of Biology, Chemistry, and Physics		8.0

Program in Criminology and Justice Studies Core Requirements

CJS 100	Freshman Seminar in Crime and Justice	3.0
CJS 101	Introduction to Criminal Justice	3.0
CJS 200	Criminology	3.0
CJS 210	Race, Crime, and Justice	3.0
CJS 220	Crime and the City	3.0
CJS 260	Justice in Our Community	4.0
CJS 261	Prison, Society and You	3.0
CJS 290	Crime and Public Policy	3.0
CJS 375	Criminal Procedure	3.0
CJS 376	Sentencing	3.0
PHIL 330	Criminal Justice Ethics	3.0

Global Perspectives

Any courses across the university whose descriptions are global and/or comparative		6.0

Methods and Analytics Sequence

CJS 250	Research Methods & Analytics I	3.0
CJS 300	Research Methods and Analytics II	3.0
CJS 301	Methods and Analytics III	4.0
CJS 302	Advanced Criminological Theorizing	3.0
CJS 320	Comparative Justice Systems	3.0
CJS 330	Crime Mapping I Using Geographic Information Systems	4.0
CJS 400	Capstone in Criminology and Justice Policy	3.0
CJS 331	Crime Mapping II Using Geographic Information Systems	4.0
CJS 401	Program Evaluation	3.0

Criminology and Justice Policy Thematic Concentration

Select eight of the following:		24.0
CJS 266	Crime Prevention Planning	
CJS 267	Introduction to Security Studies	
CJS 273	Surveillance, Technology, and the Law	
CJS 276	Introduction to Computer Crime	
CJS 278	Introduction to Law Enforcement	
CJS 280	Communities and Crime	
CJS 289	Terrorism	
CJS 295	International Field Experience	
CJS 360	Juvenile Justice	
CJS 362	Gender, Crime, and Justice	
CJS 372	Death Penalty - An American Dilemma	
CJS 373	Environmental Crime	
CJS 374	Restorative Justice	
PSCI 229	Theories of Justice	

Program Electives

Complete 6 credits from the following:		6.0
CJS 265	Criminal Investigation	
CJS 275	Issues in Domestic Violence	
CJS 365	Computer Investigations and the Law	
CJS 369	Forensic Science Survey Course	
CJS 378	Science of Forensic Science	
CJS 379	Forensic DNA Analysis	
CJS T380	Special Topics in Criminology and Justice Studies	
CJS I399	Independent Study in CJS	

Free Electives		**27.0**
Total Credits		182.0-184.0

Criminology and Justice Policy concentration

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Sample Plan of Study

Term 1		Credits
CJS 100	Freshman Seminar in Crime and Justice	3.0
CJS 101	Introduction to Criminal Justice	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
UNIV H101	The Drexel Experience	1.0
Math sequence		3.0-4.0
	Term Credits	13.0-14.0
Term 2		
CJS 260	Justice in Our Community	4.0
COM 150	Mass Media and Society	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
PHIL 101	Introduction to Western Philosophy	3.0
Math sequence		3.0-4.0
	Term Credits	16.0-17.0
Term 3		
ANTH 101	Introduction to Cultural Diversity	3.0
CIVC 101	Introduction to Civic Engagement	1.0
CJS 200	Criminology	3.0
CJS 261	Prison, Society and You	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PSCI 100	Introduction to Political Science	4.0
	Term Credits	17.0
Term 4		

CJS 210	Race, Crime, and Justice	3.0
CJS 250	Research Methods & Analytics I	3.0
PHIL 330	Criminal Justice Ethics	3.0
CJS Course		3.0
Free Elective		3.0
	Term Credits	15.0
Term 5		
CJS 300	Research Methods and Analytics II	3.0
SOC 101	Introduction to Sociology	3.0
Science Sequence		4.0
CJS Course		3.0
Global Persp. Course		3.0
	Term Credits	16.0
Term 6		
CJS 301	Methods and Analytics III	4.0
Science Sequence		4.0
CJS Course		3.0
Free electives		5.0
	Term Credits	16.0
Term 7		
PSY 101	General Psychology I	3.0
CJS Courses		6.0
Fine Arts Elective		3.0
Free Electives		3.0
	Term Credits	15.0
Term 8		
CJS 220	Crime and the City	3.0
CJS 290	Crime and Public Policy	3.0
CJS 330	Crime Mapping I Using Geographic Information Systems	4.0
CJS 375	Criminal Procedure	3.0
Free Elective		3.0
	Term Credits	16.0
Term 9		
CJS 302	Advanced Criminological Theorizing	3.0
CJS 320	Comparative Justice Systems	3.0
CJS 376	Sentencing	3.0
Program Elective		3.0
Free Elective		3.0
	Term Credits	15.0
Term 10		
Program Elective		3.0
English 200+		3.0
History Elective		4.0
CJS Course		3.0
Free Elective		3.0
	Term Credits	16.0
Term 11		
CJS 401	Program Evaluation	3.0
CJS 331	Crime Mapping II Using Geographic Information Systems	4.0
UNIV H201	Looking Forward: Academics and Careers	1.0
CJS Course		3.0
Free Elective		3.0
	Term Credits	14.0
Term 12		
CJ 400	Capstone in Criminology and Justice Policy	3.0
CJS Course		3.0
Global Persp. Course		3.0
Free Electives		4.0
	Term Credits	13.0

Total Credit: 182.0-184.0

Criminology and Justice Policy concentration

Professional Experiences

Students will complete one co-op (i.e., professional placement), typically during the spring and summer quarters of their Junior year. When they return for the start of their senior year, they can immediately begin their (impending) post-graduation job search with their co-op experience still recent on their resume. Some placements are paid (usually in the private sector) and others are unpaid (primarily in the public sector). The placements earn students academic credit while providing professional socialization and learning with crime and justice professionals. The networking aspects of these placements are invaluable for future career development. In addition to the learning experiences, past students have received excellent letters of recommendation for future employment agencies and for graduate and law school admissions.

In recent years, students have been placed in local agencies such as the District Attorney's Office, the Institutional Law Project, the Juvenile Law Center, the Defendants Association of Philadelphia, the Philadelphia and Bucks County Prison Systems and the Pennsylvania Prison Society, Pennsylvania and New Jersey State Police. Several students have done co-ops and later worked full time at the Eastern State Penitentiary Historical Site and Museum. On the state level, co-op students have worked with the Board of Probation & Parole and other agencies. At the federal level, The US Customs Service had an agreement to accept cooperative education placements after having been screened by faculty. The faculty in Criminology and Justice Studies has been working over the past few years to expand its list of research co-ops (primarily for students working toward graduate school) and international co-ops.

Criminology and Justice Studies Faculty

Robert D'Ovidio, PhD *(Temple University)*. Associate Professor. The intersection of computer technology, crime and the criminal justice system, criminological theory, policing, transnational crime.

Ashley Dickinson, PhD *(Indiana University of Pennsylvania)*. Assistant Teaching Professor. Corrections; offender rehabilitation; risk management; offender classification; gender and crime.

Jordan Hyatt, PhD, JD *(University of Pennsylvania, Villanova University School of Law)*. Associate Professor. Community corrections; drug treatment; homelessness; probation/parole; re-entry; risk assessment; sentencing.

Shannon Jacobsen, PhD *(Rutgers University)*. Assistant Professor. Gender, crime and victimization, fear of crimes and perceptions of risk, campus crime, public safety, communications and crime, social inequities, mixed methods research

Robert J. Kane, PhD *(Temple University) Department Head*. Professor. Police authority and accountability; urban ecology and sociology; violence and public health; police strategies and practices.

Kathleen Powell, PhD *(Rutgers University)*. Post-Doctoral Fellow. Collateral consequences of incarceration, juvenile justice, quasi-experimental research design.

Cyndi Rickards, EdD *(Drexel University)*. Assistant Teaching Professor. On-line pedagogy; service-learning pedagogy; juvenile justice; domestic violence.

Kristene Unsworth, PhD *(University of Washington)*. Assistant Teaching Professor. Information science, policy and ethics, critical discourse analysis and qualitative methodology.

Criminology and Justice Studies

Major: Criminology and Justice Studies
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 182.0
Co-op Options: One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 45.0401
Standard Occupational Classification (SOC) code: 11-9199

Justice Informatics Concentration

Program Description

With its thematic concentration in Justice Informatics (JI), Drexel University has transformed the traditional criminal justice degree program to produce graduates who possess knowledge and skills that are highly valued by criminal justice agencies in the 21st century. Namely, the program draws from criminology and criminal justice and computing and informatics to produce globally aware and technology proficient graduates who bring an analytical and information-led approach to solving the problems crime creates for society.

Each exposure to the criminal justice system represents a data collection point, which becomes part of a massive and disparate array of data held by the government. Students will learn how to collect, manage, visualize, and analyze large sources of information so that they can bring their expertise into the crime and justice occupational arena and/or graduate school. In addition to learning to work with "big" data in the public justice arena, students will learn how to identify, collect, manage, and use data from the expansive -- and rapidly growing -- private system of justice and security to creative innovative solutions for identifying, solving, and preventing crime.

Graduates of Drexel's Justice Informatics concentration will be ideally suited to meet the demands of the growing job market for crime analysts among criminal justice, defense, and intelligence agencies and in the private-sector security community. Crime analysts have become an essential part of the modern criminal justice agency. They have become vital to, for example, the large police department looking to deploy resources in a manner that matches crime trends, the intelligence agency working to prevent terrorist events, and the financial services firm hoping to identify the fraudulent use of a credit card. JI graduates can also play an integral role on teams that build future information technology solutions for intelligence, defense, and criminal justice agencies from the public and private sectors.

Given the global nature of crime and justice issues, JI requires one course on international justice systems; and it encourages all students to participate in at least one faculty-led study abroad program during which students will explore various justice-related themes (examples of recent trips: *The Legacy of Nazi Policing and Cold War Justice in Munich and Prague;* and *Crime and Justice in Scandinavia.* Please visit the Study Abroad Program (https://studyabroad.drexel.edu/?FuseAction=Programs.ListAll) web page to view the location and itinerary of the 2019 study tour). The emphasis on comparative justice and study abroad reside at the leading edge of Drexel's core value of global citizenship.

The Justice Informatics thematic concentration reserves 27.0 credits of free electives so that students can earn a minor outside the Program in Criminology and Justice Studies. Students interested in intelligence/security-related careers should consider minoring in a language. Visit Drexel's Modern Languages Program (http://www.drexel.edu/culturecomm/academics/undergraduate/modernlang/languages/) web page for a list of language minors.

Additional Information

For more information about the Justice Informatics concentration, please contact:

Robert D'Ovidio, PhD
Associate Professor of Criminology and Justice Studies
College of Arts and Sciences
rd64@drexel.edu

Justice Informatics Concentration

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Degree Requirements

General Degree Requirements

ANTH 101	Introduction to Cultural Diversity	3.0
CIVC 101	Introduction to Civic Engagement	1.0
COM 150	Mass Media and Society	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 101	Introduction to Western Philosophy	3.0
PSCI 100	Introduction to Political Science	4.0
PSY 101	General Psychology I	3.0
SOC 101	Introduction to Sociology	3.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
English Elective (any ENGL course over 200-level)		3.0
Fine Arts Elective		3.0
History Elective		4.0
Math Sequences		
Take any two math courses		6.0-8.0
Science Sequences		
Take any two Science courses with a lab from any combination of Biology, Chemistry, and Physics		8.0
Program in Criminology and Justice Study Core Requirements		
CJS 100	Freshman Seminar in Crime and Justice	3.0
CJS 101	Introduction to Criminal Justice	3.0
CJS 200	Criminology	3.0
CJS 210	Race, Crime, and Justice	3.0
CJS 220	Crime and the City	3.0
CJS 260	Justice in Our Community	4.0
CJS 261	Prison, Society and You	3.0
CJS 290	Crime and Public Policy	3.0
CJS 375	Criminal Procedure	3.0
CJS 376	Sentencing	3.0
PHIL 330	Criminal Justice Ethics	3.0

Global Perspectives

Any course across the University whose description is global and/or comparative		3.0
CJS 320	Comparative Justice Systems	3.0

Methods and Analytics Sequence

CJS 250	Research Methods & Analytics I	3.0
CJS 300	Research Methods and Analytics II	3.0
CJS 301	Methods and Analytics III	4.0
CJS 330	Crime Mapping I Using Geographic Information Systems	4.0
CJS 331	Crime Mapping II Using Geographic Information Systems	4.0

Justice Informatics Thematic Concentration

CJS 267	Introduction to Security Studies	3.0
CJS 273	Surveillance, Technology, and the Law	3.0
CJS 302	Advanced Criminological Theorizing	3.0
CJS 276	Introduction to Computer Crime	3.0
CJS 365	Computer Investigations and the Law	3.0
CJS 366	Technology and the Justice System	3.0
CJS 400	Capstone in Criminology and Justice Policy	3.0
INFO 101	Introduction to Computing and Security Technology	3.0
INFO 103	Introduction to Data Science	3.0
INFO 105	Introduction to Informatics	3.0
INFO 108	Foundations of Software	3.0
INFO 110	Introduction to Human-Computer Interaction	3.0
INFO 200	Systems Analysis I	3.0
INFO 210	Database Management Systems	3.0
INFO 440	Social Media Data Analysis	3.0
Free Electives		**24.0**
Total Credits		182.0-184.0

Sample Plan of Study - Justice Informatics Concentration

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
CJS 101	Introduction to Criminal Justice	3.0
CJS 100	Freshman Seminar in Crime and Justice	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
UNIV H101	The Drexel Experience	1.0
Math Sequence		3.0-4.0
	Term Credits	13.0-14.0
Term 2		
CJS 260	Justice in Our Community	4.0
COM 150	Mass Media and Society	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
PHIL 101	Introduction to Western Philosophy	3.0
Math Sequence		3.0-4.0
	Term Credits	16.0-17.0
Term 3		
ANTH 101	Introduction to Cultural Diversity	3.0
CIVC 101	Introduction to Civic Engagement	1.0
CJS 200	Criminology	3.0
CJS 261	Prison, Society and You	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PSCI 100	Introduction to Political Science	4.0
	Term Credits	17.0

Term 4		
CJS 210	Race, Crime, and Justice	3.0
CJS 250	Research Methods & Analytics I	3.0
CJS 276	Introduction to Computer Crime	3.0
INFO 101	Introduction to Computing and Security Technology	3.0
PHIL 330	Criminal Justice Ethics	3.0
	Term Credits	15.0
Term 5		
CJS 300	Research Methods and Analytics II	3.0
INFO 105	Introduction to Informatics	3.0
Science Sequence		4.0
Free Elective		2.0
Global Perspectives Course		3.0
	Term Credits	15.0
Term 6		
CJS 273	Surveillance, Technology, and the Law	3.0
CJS 301	Methods and Analytics III	4.0
INFO 108	Foundations of Software	3.0
INFO 110	Introduction to Human-Computer Interaction	3.0
Science Sequence		4.0
	Term Credits	17.0
Term 7		
CJS 267	Introduction to Security Studies	3.0
INFO 200	Systems Analysis I	3.0
PSY 101	General Psychology I	3.0
Fine Arts Elective		3.0
SOC 101	Introduction to Sociology	3.0
	Term Credits	15.0
Term 8		
CJS 220	Crime and the City	3.0
CJS 290	Crime and Public Policy	3.0
CJS 330	Crime Mapping I Using Geographic Information Systems	4.0
CJS 375	Criminal Procedure	3.0
Free Elective		3.0
	Term Credits	16.0
Term 9		
CJS 302	Advanced Criminological Theorizing	3.0
CJS 320	Comparative Justice Systems	3.0
CJS 376	Sentencing	3.0
INFO 210	Database Management Systems	3.0
Free Elective		3.0
	Term Credits	15.0
Term 10		
CJS 366	Technology and the Justice System	3.0
English 200+		3.0
History Elective		4.0
Free Electives		3.0
	Term Credits	13.0
Term 11		
INFO 240	Introduction to Data Science	3.0
CJS 331	Crime Mapping II Using Geographic Information Systems	4.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Free Elective		7.0
	Term Credits	15.0
Term 12		
CJS 365	Computer Investigations and the Law	3.0
CJS 400	Capstone in Criminology and Justice Policy	3.0
INFO 440	Social Media Data Analysis	3.0

Free Electives	6.0
Term Credits	15.0

Total Credit: 182.0-184.0

Justice Informatics Concentration

Professional Experiences

Students will complete one co-op (i.e., professional placement), typically during the spring and summer quarters of their Junior year. This way, when they return for the start of their senior year, they can immediately begin their (impending) post-graduation job search with their co-op experience still recent on their resume. Some placements are paid (usually in the private sector) and others are unpaid (primarily in the public sector).

 The placements earn students academic credit while providing professional socialization and learning with crime and justice professionals. The networking aspects of these placements are invaluable for future career development. In addition to the learning experiences, past students have received excellent letters of recommendation for future employment agencies and for graduate and law school admissions.

In recent years, students have been placed in local agencies such as the District Attorney's Office, the Institutional Law Project, the Juvenile Law Center, the Defendants Association of Philadelphia, the Philadelphia and Bucks County Prison Systems and the Pennsylvania Prison Society, Pennsylvania and New Jersey State Police. Several students have co-op'd and later worked full time at the Eastern State Penitentiary Historical Site and Museum. On the state level, co-op students have worked with the Board of Probation & Parole and other agencies. At the federal level, The US Customs Service had an agreement to accept cooperative education placements after having been screened by faculty. The faculty in Criminology and Justice Studies has been working over the past few years to expand its list of research co-ops (primarily for students working toward graduate school) and international co-ops.

Criminology and Justice Studies Faculty

Robert D'Ovidio, PhD *(Temple University)*. Associate Professor. The intersection of computer technology, crime and the criminal justice system, criminological theory, policing, transnational crime.

Ashley Dickinson, PhD *(Indiana University of Pennsylvania)*. Assistant Teaching Professor. Corrections; offender rehabilitation; risk management; offender classification; gender and crime.

Jordan Hyatt, PhD, JD *(University of Pennsylvania, Villanova University School of Law)*. Associate Professor. Community corrections; drug treatment; homelessness; probation/parole; re-entry; risk assessment; sentencing.

Shannon Jacobsen, PhD *(Rutgers University)*. Assistant Professor. Gender, crime and victimization, fear of crimes and perceptions of risk, campus crime, public safety, communications and crime, social inequities, mixed methods research

Robert J. Kane, PhD *(Temple University) Department Head*. Professor. Police authority and accountability; urban ecology and sociology; violence and public health; police strategies and practices.

Kathleen Powell, PhD *(Rutgers University)*. Post-Doctoral Fellow. Collateral consequences of incarceration, juvenile justice, quasi-experimental research design.

Cyndi Rickards, EdD *(Drexel University)*. Assistant Teaching Professor. On-line pedagogy; service-learning pedagogy; juvenile justice; domestic violence.

Kristene Unsworth, PhD *(University of Washington)*. Assistant Teaching Professor. Information science, policy and ethics, critical discourse analysis and qualitative methodology.

Criminology and Justice Studies

Major: Criminology and Justice Studies
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 182.0
Co-op Options: One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 45.0401
Standard Occupational Classification (SOC) code: 11-9199

Criminal Justice Concentration

The Criminal Justice concentration is housed in the Department of Criminology and Justice Studies and was designed as the most flexible of our three concentrations. The Criminal Justice concentration focuses its curriculum primarily on the substance of criminal justice institutions and crime and does not require many of the analytics and computer-based courses that the other two concentrations require. This concentration is primarily intended for students seeking to double major, prepare for law school, take on multiple minors (e.g., a language and legal studies), or for students who desire a traditional criminal justice education. Because the Criminal Justice concentration reserves 41.0 credits of free electives, it easily allows students to explore a wide range of curriculum opportunities throughout Drexel. Students in the Criminal Justice concentration often double major in Psychology, Behavioral Health, Legal Studies, Business, and Global Studies; and they often take on a language minor. Moreover, although the Criminal Justice concentration does not require most of the analytical courses (e.g., Crime Mapping using Geographic Information Systems) as the other two concentration, it does allow students to take any number of those courses as electives while they pursue other curricular pathways.

The Criminal Justice concentration offers the same community-based learning and global perspective courses as the other two concentrations. Students in all three concentrations are encouraged to participate in at least one faculty-led study abroad program during which students will explore various justice related themes. Recent trips have been *The Legacy of Nazi Policing in Munich and Prague;* and *Crime and Justice in Scandinavia*. Please see the Study Abroad Program (https://studyabroad.drexel.edu/?FuseAction=Programs.ListAll) web page to view the location and itinerary of the 2019 study tour. The emphasis on comparative justice and study abroad reside at the leading edges of Drexel's core value of global citizenship.

Criminal Justice Concentration

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Degree Requirements

General Requirements

ANTH 101	Introduction to Cultural Diversity	3.0
COM 150	Mass Media and Society	3.0

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 101	Introduction to Western Philosophy	3.0
PSCI 100	Introduction to Political Science	4.0
PSY 101	General Psychology I	3.0
SOC 101	Introduction to Sociology	3.0
English Elective (any ENGL course over 200-level)		3.0
Fine Arts Elective		3.0
History Elective		4.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
CIVC 101	Introduction to Civic Engagement	1.0
Math Sequences		
Take any two Math courses		6.0-8.0
Science Sequence		
Take any two Science courses with a lab from any combination of Biology, Chemistry, and Physics		8.0
Program in Criminology and Justice Studies Core Requirements		
CJS 100	Freshman Seminar in Crime and Justice	3.0
CJS 101	Introduction to Criminal Justice	3.0
CJS 200	Criminology	3.0
CJS 210	Race, Crime, and Justice	3.0
CJS 220	Crime and the City	3.0
CJS 260	Justice in Our Community	4.0
CJS 261	Prison, Society and You	3.0
CJS 290	Crime and Public Policy	3.0
CJS 375	Criminal Procedure	3.0
CJS 376	Sentencing	3.0
PHIL 330	Criminal Justice Ethics	3.0
Methods and Analytics Sequence		
CJS 250	Research Methods & Analytics I	3.0
CJS 300	Research Methods and Analytics II	3.0
Criminal Justice Thematic Concentration		
CJS 266	Crime Prevention Planning	3.0
CJS 276	Introduction to Computer Crime	3.0
CJS 278	Introduction to Law Enforcement	3.0
CJS 280	Communities and Crime	3.0
CJS 360	Juvenile Justice	3.0
Program Electives		
Complete 10 of the following courses: [*]		**30.0**
CJS 265	Criminal Investigation	
CJS 273	Surveillance, Technology, and the Law	
CJS 274	Sex, Violence, & Crime on the Internet	
CJS 275	Issues in Domestic Violence	
CJS 289	Terrorism	
CJS 295	International Field Experience	
CJS 301	Methods and Analytics III	
CJS 302	Advanced Criminological Theorizing	
CJS 320	Comparative Justice Systems	
CJS 330	Crime Mapping I Using Geographic Information Systems	
CJS 331	Crime Mapping II Using Geographic Information Systems	
CJS 362	Gender, Crime, and Justice	
CJS 365	Computer Investigations and the Law	
CJS 366	Technology and the Justice System	
CJS 372	Death Penalty - An American Dilemma	
CJS 373	Environmental Crime	
CJS 377	Intellectual Property Theft in the Digital Age	
CJS T380	Special Topics in Criminology and Justice Studies	
CJS I399	Independent Study in CJS	
PSCI 229	Theories of Justice	
Free Electives		42.0
Total Credits		182.0-184.0

[*] Review the prerequisites before trying to register.

Criminal Justice Concentration

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Sample Plan of Study

Term 1		Credits
CJS 100	Freshman Seminar in Crime and Justice	3.0
CJS 101	Introduction to Criminal Justice	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
UNIV H101	The Drexel Experience	1.0
Math Sequence		3.0-4.0
	Term Credits	13.0-14.0
Term 2		
CJS 260	Justice in Our Community	4.0
COM 150	Mass Media and Society	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
PHIL 101	Introduction to Western Philosophy	3.0
Math Sequence		3.0-4.0
	Term Credits	16.0-17.0
Term 3		
ANTH 101	Introduction to Cultural Diversity	3.0
CIVC 101	Introduction to Civic Engagement	1.0
CJS 200	Criminology	3.0
CJS 261	Prison, Society and You	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
PSCI 100	Introduction to Political Science	4.0
	Term Credits	17.0
Term 4		
CJS 210	Race, Crime, and Justice	3.0
CJS 250	Research Methods & Analytics I	3.0
PHIL 330	Criminal Justice Ethics	3.0
SOC 101	Introduction to Sociology	3.0
CJS Course		3.0
	Term Credits	15.0
Term 5		
CJS 300	Research Methods and Analytics II	3.0
CJS 360	Juvenile Justice	3.0
CJS Course		3.0
Free Elective		3.0
Science Sequence		4.0
	Term Credits	16.0
Term 6		
CJS 266	Crime Prevention Planning	3.0
CJS Courses		6.0
Science Sequence		4.0
Free Elective		3.0
	Term Credits	16.0

Term 7

PSY 101	General Psychology I	3.0
Fine Arts Elective		3.0
CJS Course		3.0
Free Electives		6.0
	Term Credits	15.0

Term 8

CJS 290	Crime and Public Policy	3.0
CJS 220	Crime and the City	3.0
CJS 375	Criminal Procedure	3.0
Free Electives		6.0
	Term Credits	15.0

Term 9

CJS 280	Communities and Crime	3.0
CJS 376	Sentencing	3.0
CJS Course		3.0
History Elective		4.0
Free Elective		3.0
	Term Credits	16.0

Term 10

CJS 276	Introduction to Computer Crime	3.0
CJS Course		3.0
English 200+		3.0
Free Elective		6.0
	Term Credits	15.0

Term 11

CJS 278	Introduction to Law Enforcement	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
CJS Courses		6.0
Free Electives		6.0
	Term Credits	16.0

Term 12

CJS Course		3.0
Free Electives		9.0
	Term Credits	12.0

Total Credit: 182.0-184.0

Criminal Justice Concentration

Professional Experiences

Students will complete one co-op (i.e., professional placement), typically during the spring and summer quarters of their Junior year. When they return for the start of their senior year, they can immediately begin their (impending) post-graduation job search with their co-op experience still recent on their resume. Some placements are paid (usually in the private sector) and others are unpaid (primarily in the public sector). The placements earn students academic credit while providing professional socialization and learning with crime and justice professionals. The networking aspects of these placements are invaluable for future career development. In addition to the learning experiences, past students have received excellent letters of recommendation for future employment agencies and for graduate and law school admissions.

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English

Major: English
Degree Awarded: Bachelor of Arts (BA)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 23.9999
Standard Occupational Classification (SOC) code: 25-1123

About the Program

The English curriculum focuses on three areas:

- A rich **Academic Core** grounded in disciplinary expertise that promotes literary exploration, sophisticated textual literacy, excellent writing, and other transferable skills;
- **Applied Learning** opportunities using skills in research, interpretation, analysis, and writing to solve real-world problems;
- Opportunities for **Civic Engagement**, connecting with community partners to promote social justice and the common good.

Our flexible curriculum offers two tracks: in Literary Studies and in Writing. We study British, American, and World literatures, stressing the cultural, historical, and political contexts that shape literary production. Courses in creative and professional writing are reinforced by opportunities for hands-on experience in writing, editing, and publishing.

The Department of English and Philosophy (http://www.drexel.edu/coas/academics/departments-centers/english-philosophy/) offers an intellectually stimulating learning experience that embraces opportunities in Philadelphia, in our region, and across the world. Our dedicated and award-winning faculty enable creativity and rigor within a supportive environment.

Students develop solid techniques in critical inquiry as well as in writing, literary analysis, and research skills. We engage issues critical to success in the twenty-first century: the connection between oral, written, and digital modes; analytical, ethical, and critical thinking; the relevance and relation of the past to the present; the relations between and among cultures; the role of literary and philosophical texts in our attempts to explain human motives and behavior; issues of personal and communal identity; and the connection of the literary arts to social change.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

UNIVERSITY REQUIREMENTS (minimum 62 credits)

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Mathematics courses for a minimum of 6.0 credits		6.0
Science courses for a minimum of 6.0 credits		6.0
Language requirement (2 consecutive courses, reaching at least 103)		8.0
Social and Behavioral Science courses for a minimum of 12 credits		12.0
Humanities courses (other than ENGL or WRIT) for a minimum of 6 credits		6.0
International Studies courses for a minimum of 6 credits		6.0
Studies in Diversity courses for a minimum of 6 credits		6.0

MAJOR REQUIREMENTS (30-credit CORE plus 36-credit concentration either in LITERARY STUDIES or in WRITING)

Core Courses, Required for All Concentrations		**30.0**
ENGL 195	English Freshman Seminar	
ENGL 207 [WI]	African American Literature	
ENGL 301	English Major Colloquium (1-credit course, repeat twice for 3 credits total)	
ENGL 315 [WI]	Shakespeare	
ENGL 325	Topics in World Literature	
ENGL 355 [WI]	Women and Literature	
ENGL 495	Senior Project in Literature	
WRIT 195	Threshold Concepts in Writing	
WRIT 200	Language Puzzles and Word Games: Issues in Modern Grammar	
WRIT 225 [WI]	Creative Writing	
Concentration in LITERARY STUDIES or in WRITING		**36.0**
A) Literary Studies Concentration (36 credits)		

Literature Surveys - Select 4 for a minimum of 12 credits

ENGL 200 [WI]	Classical to Medieval Literature
ENGL 201	Renaissance to the Enlightenment
ENGL 202 [WI]	Romanticism to Modernism
ENGL 203 [WI]	Survey of World Literature
ENGL 204	Post-Colonial Literature
ENGL 205 [WI]	American Literature I
ENGL 206 [WI]	American Literature II
ENGL 211 [WI]	British Literature I
ENGL 212	British Literature II

Authors and Periods - Select 1 for a minimum of 3 credits

ENGL 310 [WI]	Period Studies
or ENGL 32	Major Authors

Literary Impacts - Select 1 for a minimum of 3 credits

ENGL 300 [WI]	Literature & Science
or ENGL 32	Literature and Other Arts
or ENGL 36	Literature and Society

Literary Traditions - Select one for a minimum of 3 credits

ENGL 330	The Bible as Literature
or ENGL 33	Mythology

Literary Theory - 3 credits

ENGL 380	Literary Theory

Literature Seminars - Take both for a minimum of 6 credits

ENGL 490	Seminar in English and American Literature
ENGL 492	Seminar in World Literature

English Electives - minimum of 6 credits

Choose any additional 2 courses (300+) in ENGL or WRIT for a minimum of 6 credits

B) Writing Concentration

Foundations - Select 1 for a minimum of 3 credits

WRIT 210 [WI]	The Peer Reader in Context
or WRIT 21	Advanced Composition

Rhetoric and Technique - Select 1 for a minimum of 3 credits

WRIT 212	Argument and Rhetoric
or WRIT 29	Forms Seminar

Audience Awareness - Select 1 for a minimum of 3 credits

WRIT 312 [WI]	Writing for Target Audiences
or WRIT 31	Writing for Social Change

Writing Practices - Select 7 additional courses for a minimum of 21 credits (at least 5 must be WRIT or ENGL courses)

COM 160	Introduction to Journalism
COM 270 [WI]	Business Communication
COM 310 [WI]	Technical Communication
COM 375 [WI]	Grant Writing
ENGL 312	Research Project Development
SCRP 220	Playwriting I
SCRP 270 [WI]	Screenwriting I
WRIT 210 [WI]	The Peer Reader in Context
WRIT 211	Advanced Composition
WRIT 212	Argument and Rhetoric
WRIT 215 [WI]	Story Medicine
WRIT 220 [WI]	Creative Nonfiction Writing
WRIT 226	Writing in Public Spaces
WRIT 250	"Mistakes Were Made": Truth, Writing, and Responsibility
WRIT 295	Forms Seminar
WRIT 301 [WI]	Writing Poetry
WRIT 302 [WI]	Writing Fiction
WRIT 303	Writing Humor and Comedy
WRIT 305	Life is Beautiful
WRIT 306	Writing About the Media
WRIT 310	Literary Editing & Publication

WRIT 311	Writing and Reading the Memoir	
WRIT 312 [WI]	Writing for Target Audiences	
WRIT 315	Writing for Social Change	
WRIT 400 [WI]	Writing for -- and about -- the Web	
WRIT 401	Advanced Poetry Workshop	
WRIT 405	Internship in Publishing	
WRIT T380	Special Topics in Writing	
English Electives - minimum of 6 credits		
Choose any additional 2 courses (300+) in WRIT or ENGL for a minimum of 6 credits		
FREE ELECTIVES		**52.0**
Choose 52 credits from any discipline. Consider a second major or minor, or education certification.		
Total Credits		180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENGL 195	English Freshman Seminar	3.0
UNIV H101	The Drexel Experience	1.0
Foreign Language Course (1st consecutive course)		4.0
Math elective		3.0
Social/Behavorial Sciences elective		3.0
	Term Credits	17.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
WRIT 200	Language Puzzles and Word Games: Issues in Modern Grammar	3.0
Foreign Language Course (2nd consecutive course, at least 103-level)		4.0
Math elective		3.0

Social/Behavioral Science elective		3.0
	Term Credits	17.0
Term 3		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
ENGL 207 [WI]	African American Literature	3.0
WRIT 195	Threshold Concepts in Writing	3.0
Social/Behavioral Science		3.0
Science Elective		3.0
	Term Credits	15.0
Term 4		
ENGL 301	English Major Colloquium (1st of 3)	1.0
WRIT 225 [WI]	Creative Writing	3.0
Literature Survey - 1st of 4		3.0
Science elective		3.0
International Studies elective		3.0
Social/Behavioral Sciences		3.0
	Term Credits	16.0
Term 5		
Literature Survey - 2nd of 4		3.0
Literature Survey - 3rd of 4		3.0
Diversity Studies		3.0
International Studies elective		3.0
Humanities elective		3.0
	Term Credits	15.0
Term 6		
ENGL 301	English Major Colloquium (2nd of 3)	1.0
ENGL 315 [WI]	Shakespeare	3.0
Literature Survey - 4th of 4		3.0
Diversity Studies		3.0
Humanities elective		3.0
Free elective		3.0
	Term Credits	16.0
Term 7		
ENGL 325	Topics in World Literature	3.0
ENGL 310 [WI] or 320 [WI]	Period Studies Major Authors	3.0
Free electives		9.0
	Term Credits	15.0
Term 8		
ENGL 301	English Major Colloquium (3rd of 3)	1.0
ENGL 330 or 335	The Bible as Literature Mythology	3.0
ENGL 355 [WI]	Women and Literature	3.0
Free electives		6.0
	Term Credits	13.0
Term 9		
ENGL 300 [WI] , 323, or 360 [WI]	Literature & Science Literature and Other Arts Literature and Society	3.0
ENGL 380	Literary Theory	3.0
Free electives		9.0
	Term Credits	15.0
Term 10		
ENGL 490	Seminar in English and American Literature	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
English elective (ENGL or WRIT)		3.0
Free electives		9.0
	Term Credits	16.0
Term 11		
ENGL 492	Seminar in World Literature	3.0
English elective		3.0

Free electives		6.0
	Term Credits	12.0
Term 12		
ENGL 495	Senior Project in Literature	3.0
Free electives		10.0
	Term Credits	13.0

Total Credit: 180.0

*   See degree requirements (p. 70).

Co-op/Career Opportunities

English majors pursue a range of professions. Many go on to law school or graduate studies. Others build careers in business, politics and government, education, digital and popular media, publishing, and communications. The critical thinking, analytical, and writing skills provided by our program are essential for high-level decision-making and problem solving in any professional situation.

At Drexel, English majors gain valuable work experience through co-op employment and internship opportunities. They work as writers, analysts, and researchers at major corporations, Philadelphia-area museums, city government and visitors' bureaus, television and radio stations, law firms, and nonprofit organizations.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) for more detailed information on co-op and post-graduate opportunities.

English Faculty

Jan Armon, PhD *(University of Michigan).* Associate Teaching Professor. Academic functions of personal writing, composition.

Kenneth Bingham, MA *(Temple University).* Teaching Professor. First-year writing; engineering ethics; literature of baseball.

Valerie Booth, PhD *(Emory University).* Associate Teaching Professor.

André Carrington, PhD *(New York University).* Associate Professor. Cultural politics of race, gender and genre; feminism criticism; critical race theory.

Paula Marantz Cohen, PhD *(Columbia University) Distinguished Professor, Dean of the Pennoni Honors College.* Co-editor,Journal of Modern Literature; Host of the Drexel Interview. Nineteenth- and early twentieth-century English and American literature; film studies.

Lisa DiMaio, MEd *(Temple University).* Teaching Professor. English as a second language

Dan Driscoll, MA *(Temple University) Associate Director University Writing Program.* Teaching Professor. Associate Director, University Writing Center: Curricular Initiatives. Co-Director, Minor in Writing. First-year writing.

Anne Erickson, PhD *(Purdue University).* Assistant Teaching Professor. Online educational applications; the short story cycle.

Nomi Eve, MFA *(Brown University) Director of the Creative Writing MFA Program.* Assistant Teaching Professor.

Robert Finegan, MFA *(University of Pittsburgh).* Associate Teaching Professor. First-year writing; technical and creative writing.

Alexis Finger, MS *(Queens College, CUNY).* Associate Teaching Professor. Speech; ESL; oral communication.

Valerie Fox, PhD *(SUNY at Binghamton).* Teaching Professor. Founding Editor, Press 1. Twentieth century drama; modern and contemporary American poetry; first-year writing.

Edward Fristrom, PhD *(State University of New York-Albany).* Associate Teaching Professor. Professional writing, creative writing, multimedia, and writing education.

Keunah Han, PhD *(Temple University).* Associate Teaching Professor. English as a Second Language (ESL)

Cassandra Hirsch, MFA *(Rosemont College).* Associate Teaching Professor. Fiction.

Gabriella Ibieta, PhD *(City University of New York) Director, Programs in English.* Associate Professor. Comparative literature; Cuban and Latin American fiction.

Henry Israeli, MFA *(University of Iowa).* Associate Teaching Professor. Founder and editor of Saturnalia Books, a publisher of contemporary poetry.

Kirsten Kaschock, PhD *(University of Georgia).* Associate Teaching Professor. Creative writing (poetry and prose).

Elizabeth Kimball, PhD *(Temple University).* Assistant Professor. College writing, civic engaged learning, multi lingual and trans lingual practice, history and theory of rhetoric, public and community writing,18th and 19th century U.S. rhetorical history

Miriam Kotzin, PhD *(New York University).* Professor. Founding Editor, Per Contra. American literature; genre studies; creative writing; communications.

Roger Kurtz, PhD *(University of Iowa) Department Head.* Professor. Postcolonial and world literatures

Stephen Mandell, PhD *(Temple University).* Professor. First-year writing; technical writing; speech; American literature.

Deirdre McMahon, PhD *(University of Iowa).* Teaching Professor. 19th-century British literature and culture: empire, critical race studies and analyses of material culture.

Marianallet Mendez-Rivera, PhD *(University of Minnesota).* Assistant Teaching Professor. Use of the mass media to secure, maintain and enhance political power; international technical communication—including issues of translation v. localization.

Harriet Levin Millan, MFA *(University of Iowa) Director, Certificate in Writing and Publishing.* Associate Teaching Professor. Poetry.

Jill Moses, MFA *(University of Oregon).* Associate Teaching Professor. Dramatic literature; first-year writing.

Christopher T. Nielson, PhD *(Purdue University).* Teaching Professor. Shakespeare; Renaissance drama and literature; dramatic literature; first-year writing.

Karen Nulton, PhD *(Rutgers University) Director, Writing Assessment.* Teaching Professor. Writing assessment, writing pedagogy, and writing across the curriculum.

Margene Peterson, MA *(Rhode Island School of Design)*. Assistant Teaching Professor. English as a Second Language (ESL); the learning styles and strategies of non-native speakers of English.

Maegan Poland, PhD *(University of Nevada, Las Vegas)*. Assistant Teaching Professor. Creative writing; first-year writing

Abioseh Porter, PhD *(University of Alberta, Canada)*. Professor. Comparative literature; postcolonial literatures

Donald Riggs, PhD *(University of North Carolina-Chapel Hill)*. Teaching Professor. Cinematic monsters; science fiction and fantasy literature and film; Renaissance literature; creative writing; first-year writing.

Donna Rondolone, PhD *(University of Pennsylvania)*. Associate Teaching Professor. Medieval literature; Arthurian legend; first-year writing.

Gail Rosen, JD *(Temple University)*. Teaching Professor. Literature and law; first-year writing.

Doreen Alvarez Saar, PhD *(SUNY Buffalo)*. Professor. Early American literature; Eighteenth-century America; race and gender studies.

Sheila Sandapen, PhD *(Indiana University of Pennsylvania) Assistant Director, First Year Writing Program*. Associate Teaching Professor. First-year writing; cultural studies; women's studies; history and film.

Fred A. Siegel, PhD *(New York University) Director, First-Year Writing Program*. Teaching Professor. Popular theater; dramatic literature, creative non-fiction; first-year writing.

Scott Stein, MFA *(University of Miami) Director, Drexel Publishing Group*. Teaching Professor. Creative writing; first-year writing; Founding Editor, When Falls the Coliseum: A Journal of American Culture (Or Lack Thereof).

Eva Thury, PhD *(University of Pennsylvania)*. Associate Professor. Mythology; classical literature; drama; first-year writing; desktop publishing and software documentation.

Kathleen Volk Miller, MA *(Rutgers University)*. Teaching Professor. Co-Editor,Painted Bride Quarterly (PBQ); creative writing; first-year writing.

Maria Volynsky, EdD *(Temple University) Associate Director, First-Year Writing Program; ESL Coordinator*. Associate Teaching Professor. English as a Second Language (ESL).

Scott Warnock, PhD *(Temple University) Director, Drexel Writing Center; Director, University Writing Program*. Professor. Rhetoric and composition; medical writing; information technology and literacy.

Robert A. Watts, MA *(Temple University)*. Associate Teaching Professor. Creative writing; first-year writing.

Vincent Williams, PhD *(Temple University)*. Associate Teaching Professor. First-year writing; the intersection of race, gender, class and urbanism.

Jennifer Yusin, PhD *(Emory University)*. Associate Professor. Postcolonial literature; trauma theory; literary theory; psychoanalysis, and memory studies in contemporary literature in English.

Emeritus Faculty

Valarie Arms, PhD *(Temple University)*. Professor Emeritus. Rhetoric and Composition

Richard Astro, PhD *(University of Washington) Distinguished Professor*. Provost Emeritus. Twentieth-century American literature; literature and sports.

Raymond Brebach, PhD *(University of Illinois)*. Professor Emeritus. Modern British fiction; the novel; textual studies.

Environmental Science

Major: Environmental Science
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 182.5
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: *03.0104*
Standard Occupational Classification (SOC) code: *19-2041*

About the Program

The environmental science program at Drexel University is committed to educating undergraduates for technical careers and graduate study in the diverse areas of environmental science vital to understanding, conservation and restoration of clean and healthy natural environments in the 21st century. The affiliation between the Academy of Natural Sciences (https://ansp.org/) and Drexel University offers students unique opportunities to take a leadership role in ecology, environmental science and environmental policy, and to grow the scope, capacity and reputation of the natural sciences at the University. The philosophy of the Biodiversity, Earth, and Environmental Science Department is *"Experiential Learning Early and Often."*

Environmental science is a multidisciplinary field designed to examine environmental problems and find solutions. This field requires understanding of a number of disciplines, including biology, physics and chemistry. Solving some of our environmental problems also requires knowledge of environmental policy, ethics, and scientific data analysis.

The program has an integrated curricular approach designed around student laboratory and field investigations. The goal of this program is to give students not only knowledge about biology, chemistry, and ecology but also the ability to use the tools and skills of a scientist. The program includes extensive use of computers in the laboratory, and students make frequent oral and written presentations based on their laboratory projects.

Field experience electives may include trips to local aquatic and terrestrial habitats such as streams, lakes, the John Heinz National Wildlife Refuge, New Jersey Pine Barrens, Delaware, Barnegat and Chesapeake Bays, and the Appalachian Mountains. Students are also encouraged to take advantage of study abroad (http://www.drexel.edu/studyabroad/) options, including ENVS field courses. These programs often require early planning so it is advisable for interested students to speak to their advisor about opportunities in their first year.

Concentrations are available in:

- Biodiversity and Evolution
- Ecology & Conservation
- Environmental Science

Additional Information

For more information about the program, visit the Department of Biodiversity, Earth & Environmental Science's (http://www.drexel.edu/coas/academics/departments-centers/bees/) web page.

Susan Cole
Undergraduate Advisor
Environmental Science
coless@drexel.edu or email bees@drexel.edu.

Degree Requirements

The program is designed to prepare students for careers in environmental science, environmental assessment, marine science, basic and applied ecology, biodiversity, evolutionary biology, and conservation and paleontology. The requirements for specific concentrations in biodiversity and evolution; earth science; ecology & conservation; and environmental science follow the list of degree requirements.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Degree Requirements

Humanities and Social Science		
COM 230	Techniques of Speaking	3.0
COM 310 [WI]	Technical Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 340	Environmental Ethics	3.0
or PHIL 341	Environmental Philosophy	
Humanities/Social Science electives		6.0
CIVC 101	Introduction to Civic Engagement	1.0
UNIV S101	The Drexel Experience	1.0
UNIV S201	Looking Forward: Academics and Careers	1.0
Mathematics and Statistics		**18.0**
Select one of the following sequences:		
Calculus sequence		
MATH 121	Calculus I	
MATH 122	Calculus II	
MATH 123	Calculus III	
Analysis sequence		
MATH 101	Introduction to Analysis I	
MATH 102	Introduction to Analysis II	
MATH 239	Mathematics for the Life Sciences	
Additional required mathematics courses:		
MATH 410	Scientific Data Analysis I	
MATH 411	Scientific Data Analysis II	
Physical Sciences		
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
CHEM 103	General Chemistry III	5.0
Choose two chemistry electives from:		5.0-7.0
CHEM 241	Organic Chemistry I	
ENVS 302	Environmental Chemistry Laboratory	
ENVS 310	Introduction to Environmental Chemistry	

Physics sequence		
PHYS 152	Introductory Physics I	4.0
PHYS 153	Introductory Physics II	4.0
PHYS 154	Introductory Physics III	4.0
Biological Sciences		
BIO 122	Cells and Genetics	4.5
BIO 124	Evolution & Organismal Diversity	4.5
BIO 126	Physiology and Ecology	4.5
Geoscience Requirements		
GEO 101	Physical Geology	4.0
GEO 103	Introduction to Field Methods in Earth Science	2.0
GEO 201 [WI]	Earth Systems Processes	3.0
Environmental Science Core Requirements		
ENVS 101	Introduction to Environmental Science	5.0
ENVS 102	Natural History, Research and Collections	2.0
ENVS 201	Practical Identification of Plants and Animals	2.0
ENVS 202	Tree of Life	2.0
ENVS 203	The Watershed Approach	2.0
ENVS 212	Evolution	4.0
ENVS 230	General Ecology	3.0
ENVS 308	GIS and Environmental Modeling	3.0
ENVS 441 [WI]	Issues in Global Change I: Seminar	2.0
ENVS 442	Issues in Global Change II: Research	2.0
ENVS 443	Issues in Global Change III: Synthesis	2.0
Choose one of the following:		3.0-4.0
ENSS 283	Introduction to Environmental Policy	
ENSS 326	Cities and Sustainability	
ENSS 348	Delaware River Issues and Policy	
PSCI 284	Environmental Politics	
Environmental Science Lab Requirements		**2.0**
Environmental Concentration Requirements		**12.0-13.0**
See list of concentration requirements below.		
Environmental Electives		**15.0**
Free Electives		**24.0**
Total Credits		182.5-186.5

Environmental Science Concentrations

Each concentration has four required courses. In addition, the department maintains a menu of electives specific to each concentration. Check with the department for selecting the appropriate 12.0 - 16.0 credits of Environmental Science electives.

Biodiversity & Evolution Concentration

Required Courses		
BIO 244	Genetics I	3.0
ENVS 312	Systematic Biology	3.0
ENVS 438	Biodiversity	3.0
ENVS 470	Advanced Topics in Evolution	3.0
Total Credits		12.0

Ecology & Conservation Concentration

Required Courses		
ENVS 284	Physiological and Population Ecology	3.0
ENVS 286	Community and Ecosystem Ecology	3.0
ENVS 328	Conservation Biology	3.0
Ecology & Conservation elective		3.0
Total Credits		12.0

Environmental Science Concentration

Required Courses		
ENSS 283	Introduction to Environmental Policy	3.0
ENVS 275	Global Climate Change	3.0

ENVS 284	Physiological and Population Ecology	3.0
or ENVS 286	Community and Ecosystem Ecology	
ENVS 310	Introduction to Environmental Chemistry	3.0
Total Credits		12.0

Notes about Environmental Science Opportunities:

- Field experience electives include quantitative environmental measurements in local aquatic and terrestrial habitats, such as streams, lakes, the Delaware Bay, the Poconos, and the New Jersey Pine Barrens (for example, Field Botany: NJ Pine Barrens; Ecology of the Pine Barrens; Marine Field Methods).
- Students are required to consult frequently with their academic advisors for curriculum planning. Many of the graduate courses in environmental science are also open to qualified seniors who wish to become familiar with some of the applications in the field. Prerequisites and descriptions of available graduate courses appear in the graduate catalog.
- The Equatorial Guinea: Bioko Island Study Abroad Program offers a unique opportunity for undergraduates and recent graduates to study tropical biodiversity and its conservation, with an emphasis on field work that takes advantage of Bioko Island's pristine rainforests ranging from sea level to over 10,000 feet in altitude, its seven species of rare monkeys and its four species of nesting sea turtles. For more information, please visit the Drexel Study Abroad Office (http://www.drexel.edu/studyabroad/).

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

The plan of study below is a generic plan, suited for all four concentrations. Contact the program advisor for additional details.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
CHEM 101	General Chemistry I	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENVS 101	Introduction to Environmental Science	5.0
MATH 101 or 121	Introduction to Analysis I Calculus I	4.0
UNIV S101	The Drexel Experience	1.0
	Term Credits	16.5
Term 2		
BIO 124	Evolution & Organismal Diversity	4.5
CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102 or 122	Introduction to Analysis II Calculus II	4.0
	Term Credits	17.0
Term 3		
BIO 126	Physiology and Ecology	4.5
CHEM 103	General Chemistry III	5.0
ENVS 102	Natural History, Research and Collections	2.0
GEO 103	Introduction to Field Methods in Earth Science	2.0
MATH 239 or 123	Mathematics for the Life Sciences Calculus III	4.0
	Term Credits	17.5
Term 4		
BIO 122	Cells and Genetics	4.5
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
ENVS 201	Practical Identification of Plants and Animals	2.0
GEO 101	Physical Geology	4.0
Free elective		3.0
	Term Credits	16.5
Term 5		
ENVS 202	Tree of Life	2.0
ENVS 230	General Ecology	3.0
ENVS 308	GIS and Environmental Modeling	3.0
GEO 201 [WI]	Earth Systems Processes	3.0
Free elective		3.0
	Term Credits	14.0
Term 6		
ENVS 203	The Watershed Approach	2.0
ENVS 212	Evolution	4.0
PHYS 152	Introductory Physics I	4.0
PHIL 340 or 341	Environmental Ethics Environmental Philosophy	3.0
Env Chem elective		3.0-4.0
	Term Credits	16.0-17.0
Term 7		
PHYS 153	Introductory Physics II	4.0
UNIV S201	Looking Forward: Academics and Careers	1.0
ENVS concentration course*		3.0
ENSS elective		3.0-4.0
Free elective		3.0
	Term Credits	14.0-15.0
Term 8		
COM 230	Techniques of Speaking	3.0
MATH 410	Scientific Data Analysis I	3.0
PHYS 154	Introductory Physics III	4.0
ENVS concentration course*		3.0

Humanities/Social Science elective		3.0
	Term Credits	16.0
Term 9		
COM 310 [WI]	Technical Communication	3.0
MATH 411	Scientific Data Analysis II	3.0
ENVS concentration course[*]		3.0
Env Chem elective		2.0-3.0
Free elective		3.0
	Term Credits	14.0-15.0
Term 10		
ENVS 441 [WI]	Issues in Global Change I: Seminar	2.0
ENVS concentration course[*]		3.0-4.0
Environmental Science (ENVS) elective		3.0
Environmental Science (ENVS) lab elective		2.0
Free elective		3.0
	Term Credits	13.0-14.0
Term 11		
ENVS 442	Issues in Global Change II: Research	2.0
Environmental Science (ENVS) electives		6.0
Humanities/Social Science elective		3.0
Free elective		3.0
	Term Credits	14.0
Term 12		
ENVS 443	Issues in Global Change III: Synthesis	2.0
Environmental Science (ENVS) electives		6.0
Free electives		6.0
	Term Credits	14.0

Total Credit: 182.5-186.5

[*]   See degree requirements (p. 74).

Co-op/Career Opportunities

Environmental scientists pursue careers in environmental assessment, environmental health, ecology, conservation, marine science, and atmospheric science.

Co-op Opportunities

Co-op and research opportunities will be available with the scientists at the Academy of Natural Sciences (http://www.ansp.org/). In addition, recent co-op experiences have included:

CHPlanning, Center City Philadelphia
Lakes Environmental Assn., Maine
US Environmental Protection Agency, Center City Philadelphia
Criterion Lab Inc, Philadelphia PA Suburbs
Philadelphia Water Department, Philadelphia
Temple University, Philadelphia
Fairway Testing Co., NYC
University of Alaska, Fairbanks, Alaska
Bioko Biodiversity Protection Program, Equatorial Guinea
React Environmental Professional Services Group Inc., Philadelphia
Air Management Services, Philadelphia
Exelon Corporation, Philadelphia

Graduate Opportunities

Graduates in this major typically work for government environmental agencies, in environmental consulting firms, and in environmental departments of various industries. Additional training at the graduate level is an option for many students.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Environmental Science Faculty

Ted Daeschler, PhD *(University of Pennsylvania) Associate Curator of Vertebrate Zoology; Vice President for Systematic Biology and the Library: Academy of Natural Sciences.* Associate Professor. Vertebrate fauna of the Late Devonian Period in eastern North America; fossil collecting; systematic work focusing on freshwater vertebrates; nature of early non-marine ecosystems.

Jon Gelhaus, PhD *(University of Kansas) Curator, Department of Entomology: Academy of Natural Sciences.* Professor. Systematic expertise in crane flies (Tipuloidea); phylogenetic reconstruction; historical and ecological biogeography; biodiversity measures and evolution of morphological character systems.

Danielle Kreeger, PhD *(Oregon State University).* Research Associate Professor. Trophic interactions in aquatic ecosystems.

Stefanie Kroll, PhD *(SUNY College of Environmental Science and Forestry) Project Science Director, Academy of Natural Sciences.* Assistant Research Professor. Aquatic macroinvertebrate ecology, bioindicators of human stressors on aquatic ecosystems, monitoring the effects of watershed conversation, management and restoration.

Marie J. Kurz, PhD *(University of Florida) Biogeochemistry Section Leader, Academy of Natrual Sciences.* Assistant Research Professor. Interactions between geochemical, ecological & hydrologic processes in freshwater systems. Availability, transport and cycling of stream solutes; Stream ecosystem structure & function; Groundwater-surface water interactions; Adaptive management & restoration of water resources & aquatic ecosystems.

Tatyana Livshultz, PhD *(Cornell University) Assistant Curator of Botany.* Assistant Professor. Expertise of the milkweed and dogbane family (Apocynaceae); evolution and species diversity of the genus Dischidia; differences in floral form and function.

Amanda Lough, PhD *(Washington University in St. Louis).* Assistant Professor. Volcanic seismicity and the relation to magma plumbing systems; glacial seismicity and the seismicity of Antarctica; intraplate seismicity.

Richard McCourt, PhD *(University of Arizona) Associate Curator of Botany, Academy of Natural Sciences of Drexel University; 2010-2012: Program Director, Division of Graduate Education, National Science Foundation.* Professor. Biodiversity, evolution, ecology, and systematic of green algae, specifically charophyte algae.

Michael O'Connor, MD, PhD *(MD, Johns Hopkins University; PhD, Colorado State).* Professor. Biophysical and physiological ecology, thermoregulation of vertebrates, ecological modeling.

Sean O'Donnell, PhD *(University of Wisconsin-Madison).* Professor. Tropical ecology, focusing on geographic variation and elevation effects on ecology and behavior of army ants and ant-bird interactions; neurobiology, focusing on brain plasticity and brain evolution in social insects.

Marina Potapova, PhD *(Russian Academy of Sciences) Assistant Curator.* Assistant Professor. Taxonomy, ecology, and biogeography of freshwater diatoms; methods of quantifying morphological characters of diatom

frustules based on geometric morphometrics; systematic of monoraphid freshwater diatoms.

Gary Rosenberg, PhD *(Harvard University) Pilsbry Chair of Malacology*. Professor. Magnitude and origin of species-level diversity in the Mollusca.

Jacob Russell, PhD *(University of Arizona)*. Professor. Microbiomes and metagenomics; ecology and evolution of symbiosis.

Alexis Schulman, PhD *(Massachusetts Institute of Technology) Director of the Environmental Studies and Sustainability Program*. Associate Research Professor. Environmental policy and politics, Urban planning Sustainability and resilience transitions, Policy implementation,Local knowledge and community science

Jocelyn A. Sessa, PhD *(Penn State University) Assistant Curator of Invertebrate Paleontology: Academy of Natural Sciences*. Assistant Professor. Paleoecology; paleobiology; extinction recovery dynamics; climate change; isotope geochemistry; fossil and modern mollusks

Loyc Vanderkluysen, PhD *(University of Hawaii)*. Associate Professor. The cyclicity of volcanic eruptions, volcanic degassing processes, and large igneous provinces.

David J. Velinsky, PhD *(Old Dominion University) Department Head, Biodiversity, Earth and Environmental Science*. Professor. Geochemical cycling of organic and inorganic constituents of sediments and waters; Sedimentary diagenesis of major and minor elements; Isotope biogeochemistry of carbon, nitrogen and sulfur in marine and freshwater systems.

Dane Ward, PhD *(Drexel University)*. Assistant Teaching Professor. Urban agriculture and sustainability both in Philadelphia and Cienfuegos, Cuba, as well as insect community structure and population ecology of reptiles and amphibians in the New Jersey Pine Barrens.

Elizabeth B. Watson, PhD *(University of California, Berkeley)*. Associate Professor. The implications of global and regional environmental change, and unraveling the interacting effects of multiple anthropogenic stressors on coastal ecosystems to promote more informed management, conservation, and restoration.

Jason Weckstein, PhD *(Louisiana State University) Associate Curator of Ornithology*. Associate Professor. Avian phylogenetics, comparative biology and evolutionary history; biodiversity surveys of birds and their parasites and pathogens; coevolutionary history of birds and their parasites.

Emeritus Faculty

Susan S. Kilham, PhD *(Duke University)*. Professor Emeritus. Aquatic ecology: phytoplankton; physiological ecology, especially of diatoms in freshwater and marine systems; large lakes; food webs; biogeochemistry.

John G. Lundberg, PhD *(University of Michigan)*. Professor Emeritus. Diversity and diversification of fishes; documenting and interpreting the morphological, molecular, and taxonomic diversity of living and fossil fishes in the interrelated fields of systematic, faunistics and biogeography and paleobiology; exploration and collecting in poorly-known tropical freshwater habitats and regions.

Daniel Otte, PhD *(University of Michigan) Senior Curator, Systematics and Evolutionary Biology*. Professor Emeritus. Taxonomy and

biogeography of Orthoptera (grasshoppers, crickets, katydids and their relatives).

James R. Spotila, PhD *(University of Arkansas) L. D. Betz Chair Professor*. Professor Emeritus. Physiological and biophysical ecology, thermoregulation of aquatic vertebrates, biology of sea turtles.

Environmental Studies and Sustainability

Major: Environmental Studies and Sustainability
Degree Awarded: Bachelor of Arts (BA)
Calendar Type: Quarter
Total Credit Hours: 183.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 03.0103
Standard Occupational Classification (SOC) code: 19-2041

About the Program

The BA in Environmental Studies and Sustainability (ENSS) is administered in the Department of Biodiversity, Earth and Environmental Science (BEES). It is a multidisciplinary degree that takes advantage of existing courses in both the Arts and Sciences to educate graduates who will be able to work in government agencies, corporations and nonprofit organizations who develop, implement or are affected by environmental policies.

Objective

The objective of this major is to educate students so that they will be successful in finding solutions to environmental challenges that all societies will face in the 21st century. Graduates will be educated with the goal of thinking in terms of cross-cultural ideas and dialogue. In that way they will be encouraged to help people of all cultures understand environmental problems and act in the area of environmental stewardship.

The BA in Environmental Studies and Sustainability will provide graduates with a broad understanding of environmental science, policy development, needs of decision makers, attorneys and engineers, urban and international concerns and current environmental issues. Important to any future position in fields of environmental policy, planning and sustainability, the program builds on communication skills, collaboration abilities and team building, a "customer" orientation, creativity and innovative thinking ability, analytical ability and critical thinking and problem solving ability, a work orientation with professionalism and a positive attitude, occupation-specific skill and knowledge through co-op, and leadership ability. Students may opt to specialize in different study tracks including Policy, Government and Business; Social Awareness and Action, and Scientific Inquiry.

Drexel Advantage

There is a distinct advantage to a student in undertaking an environmental studies and sustainability degree at Drexel. Drexel University was one of the first universities in the nation to establish an undergraduate environmental science degree in the late 1960s. Since that time Drexel has expanded to areas of environmental policy and sustainability. Over the long history of the program, Drexel has established an extensive network of co-op employers who value Drexel students, including federal and state governments, consulting firms, research institutions, non-profit organizations and industry, with work ranging from biological field

sampling to developing policy with governmental decision makers, action plans for non-profit organizations, or model environmental strategies with industrial sustainability offices. Drexel students take advantage of the co-op program to both get more extensive experience and get paid while doing so. By graduation, students resumes include real-world experiences.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Requirements

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
MATH 107	Probability and Statistics for Liberal Arts	3.0
UNIV S101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Social and Behavioral Sciences		
SOC 101	Introduction to Sociology	3.0
or ANTH 101	Introduction to Cultural Diversity	
PSY 101	General Psychology I	3.0
PSCI 110	American Government	4.0
Social Behavior elective		3.0
Physical and Natural Sciences		
BIO 109	Biological Diversity, Ecology & Evolution	3.0
BIO 110	Biological Diversity, Ecology and Evolution Laboratory	1.0
ENVS 101	Introduction to Environmental Science	5.0
ENVS 230	General Ecology	3.0
ENSS 275	Global Climate Change	3.0
or ENVS 289	Global Warming, Biodiversity and Your Future	
GEO 201 [WI]	Earth Systems Processes	3.0
Humanities and Fine Arts		
Humanities & Fine Arts Electives		9.0
PHIL 340	Environmental Ethics	3.0
or PHIL 341	Environmental Philosophy	
Diversity Electives		**6.0**
International Studies		**6.0**
Foreign Language		**8.0**
Students must complete at least 8 credits of a foreign language and, at minimum, must complete the 103 level of the target language (or beyond if they place higher).		
ENSS Core Requirements		
Policy and Planning		
ENSS 120	Introduction to Environmental Studies	3.0
ENSS 283	Introduction to Environmental Policy	3.0
ENSS 285	Introduction to Urban Planning	3.0
ENSS 326	Cities and Sustainability	3.0
PSCI 284	Environmental Politics	4.0
Social Science		
ENSS 244	Sociology of the Environment	4.0
ENSS 346	Environmental Justice	4.0
ENVS 260	Environmental Science and Society	3.0
SOC 355 [WI]	Classical Social Theory	4.0
Economics		

ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
Modeling and Research		
ENVS 308	GIS and Environmental Modeling	3.0
SOC 241	Research Design: Qualitative Methods	4.0
SOC 242	Research Design: Quantitative Methods	4.0
ENSS Electives		**21.0**
Senior Sequence		
ENVS 441 [WI]	Issues in Global Change I: Seminar	2.0
ENVS 442	Issues in Global Change II: Research	2.0
ENVS 443	Issues in Global Change III: Synthesis	2.0
Free Electives		24.0
Total Credits		183.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENSS 120	Introduction to Environmental Studies	3.0
ENVS 101	Introduction to Environmental Science	5.0
MATH 101	Introduction to Analysis I	4.0
UNIV S101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
BIO 109	Biological Diversity, Ecology & Evolution	3.0
BIO 110	Biological Diversity, Ecology and Evolution Laboratory	1.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
PSY 101	General Psychology I	3.0
Foreign Language		4.0
	Term Credits	15.0

Term 3

ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or 113	English Composition III	
MATH 107	Probability and Statistics for Liberal Arts	3.0
SOC 101	Introduction to Sociology	3.0
or ANTH 101	Introduction to Cultural Diversity	
Foreign Language		4.0
Free elective		3.0
	Term Credits	16.0

Term 4

ENSS 283	Introduction to Environmental Policy	3.0
ENVS 230	General Ecology	3.0
ENVS 260	Environmental Science and Society	3.0
PSCI 110	American Government	4.0
Humanities & Fine Arts elective		3.0
	Term Credits	16.0

Term 5

ENSS 275	Global Climate Change	3.0
or ENVS 289	Global Warming, Biodiversity and Your Future	
ENSS 285	Introduction to Urban Planning	3.0
ENVS 308	GIS and Environmental Modeling	3.0
Humanities & Fine Arts elective		3.0
Free elective		3.0
	Term Credits	15.0

Term 6

ECON 201	Principles of Microeconomics	4.0
ENSS 244	Sociology of the Environment	4.0
SOC 355 [WI]	Classical Social Theory	4.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Soc/Behavior elective		3.0
	Term Credits	16.0

Term 7

ECON 202	Principles of Macroeconomics	4.0
ENSS 326	Cities and Sustainability	3.0
GEO 201 [WI]	Earth Systems Processes	3.0
Humanities/Fine Arts elective		3.0
	Term Credits	13.0

Term 8

ENSS 346	Environmental Justice	4.0
PHIL 340	Environmental Ethics	3.0
or 341	Environmental Philosophy	
SOC 241	Research Design: Qualitative Methods	4.0
ENSS elective		3.0
Free elective		3.0
	Term Credits	17.0

Term 9

PSCI 284	Environmental Politics	4.0
SOC 242	Research Design: Quantitative Methods	4.0
ENSS electives		6.0
Diversity elective		3.0
	Term Credits	17.0

Term 10

ENVS 441 [WI]	Issues in Global Change I: Seminar	2.0
ENSS electives		6.0
Free elective		6.0
	Term Credits	14.0

Term 11

ENVS 442	Issues in Global Change II: Research	2.0
ENSS elective		3.0
Diversity elective		3.0
International elective		3.0
Free elective		3.0
	Term Credits	14.0

Term 12

ENVS 443	Issues in Global Change III: Synthesis	2.0
ENSS elective		3.0
International elective		3.0
Free elective		6.0
	Term Credits	14.0

Total Credit: 183.0

Career Opportunities

The largest job opportunities exist in the areas of environmental communication, sustainability, environmental policy, community action, water quality, parks and outdoor recreation, ecotourism, natural resources and conservation, international environmental policy, renewable energy, and climate change

This major will educate individuals who seek careers and/or additional academic training in the following fields:

- Sustainability planning and implementation
- Urban, Regional and Community Planning
- Geographic Information Systems
- Environmental Communications
- Environmental Journalism
- Environmental Law
- Park Management and Outdoor Recreation
- Environmental Consulting
- Environmental Policy Analysis
- Natural Resource Management

Environmental Studies and Sustainability Faculty

Ted Daeschler, PhD *(University of Pennsylvania) Associate Curator of Vertebrate Zoology; Vice President for Systematic Biology and the Library: Academy of Natural Sciences.* Associate Professor. Vertebrate fauna of the Late Devonian Period in eastern North America; fossil collecting; systematic work focusing on freshwater vertebrates; nature of early non-marine ecosystems.

Jon Gelhaus, PhD *(University of Kansas) Curator, Department of Entomology: Academy of Natural Sciences.* Professor. Systematic expertise in crane flies (Tipuloidea); phylogenetic reconstruction; historical and ecological biogeography; biodiversity measures and evolution of morphological character systems.

Danielle Kreeger, PhD *(Oregon State University).* Research Associate Professor. Trophic interactions in aquatic ecosystems.

Stefanie Kroll, PhD *(SUNY College of Environmental Science and Forestry) Project Science Director, Academy of Natural Sciences.* Assistant Research Professor. Aquatic macroinvertebrate ecology, bioindicators of human stressors on aquatic ecosystems, monitoring the effects of watershed conversation, management and restoration.

Marie J. Kurz, PhD *(University of Florida) Biogeochemistry Section Leader, Academy of Natrual Sciences.* Assistant Research Professor. Interactions between geochemical, ecological & hydrologic processes in freshwater systems. Availability, transport and cycling of stream solutes; Stream ecosystem structure & function; Groundwater-surface water

interactions; Adaptive management & restoration of water resources & aquatic ecosystems.

Tatyana Livshultz, PhD *(Cornell University) Assistant Curator of Botany*. Assistant Professor. Expertise of the milkweed and dogbane family (Apocynaceae); evolution and species diversity of the genus Dischidia; differences in floral form and function.

Amanda Lough, PhD *(Washington University in St. Louis)*. Assistant Professor. Volcanic seismicity and the relation to magma plumbing systems; glacial seismicity and the seismicity of Antarctica; intraplate seismicity.

Richard McCourt, PhD *(University of Arizona) Associate Curator of Botany, Academy of Natural Sciences of Drexel University; 2010-2012: Program Director, Division of Graduate Education, National Science Foundation*. Professor. Biodiversity, evolution, ecology, and systematic of green algae, specifically charophyte algae.

Michael O'Connor, MD, PhD *(MD, Johns Hopkins University; PhD, Colorado State)*. Professor. Biophysical and physiological ecology, thermoregulation of vertebrates, ecological modeling.

Sean O'Donnell, PhD *(University of Wisconsin-Madison)*. Professor. Tropical ecology, focusing on geographic variation and elevation effects on ecology and behavior of army ants and ant-bird interactions; neurobiology, focusing on brain plasticity and brain evolution in social insects.

Marina Potapova, PhD *(Russian Academy of Sciences) Assistant Curator*. Assistant Professor. Taxonomy, ecology, and biogeography of freshwater diatoms; methods of quantifying morphological characters of diatom frustules based on geometric morphometrics; systematic of monoraphid freshwater diatoms.

Gary Rosenberg, PhD *(Harvard University) Pilsbry Chair of Malacology*. Professor. Magnitude and origin of species-level diversity in the Mollusca.

Jacob Russell, PhD *(University of Arizona)*. Professor. Microbiomes and metagenomics; ecology and evolution of symbiosis.

Alexis Schulman, PhD *(Massachusetts Institute of Technology) Director of the Environmental Studies and Sustainability Program*. Associate Research Professor. Environmental policy and politics, Urban planning Sustainability and resilience transitions, Policy implementation,Local knowledge and community science

Jocelyn A. Sessa, PhD *(Penn State University) Assistant Curator of Invertebrate Paleontology: Academy of Natural Sciences*. Assistant Professor. Paleoecology; paleobiology; extinction recovery dynamics; climate change; isotope geochemistry; fossil and modern mollusks

Loyc Vanderkluysen, PhD *(University of Hawaii)*. Associate Professor. The cyclicity of volcanic eruptions, volcanic degassing processes, and large igneous provinces.

Dane Ward, PhD *(Drexel University)*. Assistant Teaching Professor. Urban agriculture and sustainability both in Philadelphia and Cienfuegos, Cuba, as well as insect community structure and population ecology of reptiles and amphibians in the New Jersey Pine Barrens.

Elizabeth B. Watson, PhD *(University of California, Berkeley)*. Associate Professor. The implications of global and regional environmental change, and unraveling the interacting effects of multiple anthropogenic

stressors on coastal ecosystems to promote more informed management, conservation, and restoration.

Jason Weckstein, PhD *(Louisiana State University) Associate Curator of Ornithology*. Associate Professor. Avian phylogenetics, comparative biology and evolutionary history; biodiversity surveys of birds and their parasites and pathogens; coevolutionary history of birds and their parasites.

Emeritus Faculty

Susan S. Kilham, PhD *(Duke University)*. Professor Emeritus. Aquatic ecology: phytoplankton; physiological ecology, especially of diatoms in freshwater and marine systems; large lakes; food webs; biogeochemistry.

John G. Lundberg, PhD *(University of Michigan)*. Professor Emeritus. Diversity and diversification of fishes; documenting and interpreting the morphological, molecular, and taxonomic diversity of living and fossil fishes in the interrelated fields of systematic, faunistics and biogeography and paleobiology; exploration and collecting in poorly-known tropical freshwater habitats and regions.

Daniel Otte, PhD *(University of Michigan) Senior Curator, Systematics and Evolutionary Biology*. Professor Emeritus. Taxonomy and biogeography of Orthoptera (grasshoppers, crickets, katydids and their relatives).

James R. Spotila, PhD *(University of Arkansas) L. D. Betz Chair Professor*. Professor Emeritus. Physiological and biophysical ecology, thermoregulation of aquatic vertebrates, biology of sea turtles.

Geoscience

Major: Geoscience
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 183.0
Co-op Options: Three Co-op (Five years)
Classification of Instructional Programs (CIP) code: 40.0699
Standard Occupational Classification (SOC) code: 11-9121

NOTE: The GEO concentrations will be discontinued effective Fall 2020 and will be replaced by broader elective options in the curriculum.

About the Program

From energy to climate change to environmental degradation, many of the most pressing societal issues of the coming century will pertain to geoscience. The study of the Earth is central to maintaining clean drinking water, mitigating environmental contamination, providing ores and rare elements necessary for industry, and locating new sources of energy.

The Biodiversity, Earth and Environmental Science (BEES) Department offers a major in geoscience, with three concentration options designed to meet the needs of students wishing to pursue graduate school or immediate employment in the geosciences:

- Applied Geology
- General Geoscience
- Paleontology

The core requirements encompass foundational courses in science, writing, and math, and traditional courses that form the backbone of the geosciences. Building upon these are innovative courses focused on Earth systems processes, key environmental issues, practical field experiences, and advanced geological study.

In addition to nourishing and honing the passions of students studying the Earth, the core curriculum is designed to:

1. Instill key technical skills early-on, as a pathway to high-quality co-op opportunities;
2. Lay the groundwork for our students to pursue advanced graduate study in the geosciences and other disciplines, and;
3. Enable our graduates to translate marketable skills and knowledge into high-quality jobs in industry and government.

Geoscience majors will begin their field experiences during the first term of their freshmen year. Most courses include a laboratory section or a hands-on recitation section ("dry lab"), plus at least three field trips to relevant regional geological sites. These courses, combined with the co-op experience and summer geological field camp, provide students real-world experience in the field.

About the Concentrations

Applied Geology

The applied geology concentration is designed for students wishing to enter the geoscience workforce upon graduation. Possible employment opportunities include jobs in: environmental consulting, geotechnical consulting, geophysical consulting, the petroleum and natural gas industry, the mining industry, federal agencies (e.g., USGS, USDA, NOAA, FEMA, EPA, DOI, and Army Corps of Engineers), and state and local agencies (e.g., state environmental agencies, state geological surveys, and municipal water departments).

General Geoscience

The general geoscience concentration allows maximum flexibility and is designed for students wishing to pursue other areas of study within the geosciences, students wishing to pursue policy-related careers, and students planning to apply to professional graduate programs, such as those in law or business schools. The policy component of this concentration allows students to explore related societal issues, which may help guide their career aspirations. This concentration also provides transfer students with a pathway to graduate on time.

Students graduating from this concentration will be well prepared to enter graduate school in science or policy, as well as to pursue professional studies. Students seeking immediate employment will be competitive for jobs with, for example, certain NGOs, environmental foundations, consulting companies, and government policy positions related to natural resources and the environment.

Paleontology

The concentration in paleontology prepares students who are interested in pursuing related research in graduate school and students seeking entry-level positions in paleontology. Examples of these jobs include biostratigrapher for petroleum companies, fossil resource manager for the Bureau of Land Management, and related positions with the National Parks Service, USGS, and state geological surveys.

Undergraduates in this concentration benefit from world-class resources already established at the Academy of Natural Sciences. These include the Invertebrate paleontology collection, with over 1 million specimens; the vertebrate fossil collection, with over 22,000 specimens; historically important specimens, such as the Thomas Jefferson fossil collection, the first discovered dinosaur skeleton, and the first discovered tyrannosaur; and the paleobotany collection, with over 5,000 specimens, including a large proportion of type specimens.

Students in the paleontology concentration will have access to numerous fossil sites along the Atlantic Coastal Plain and in the Appalachian Province. Opportunities exist for student research at two well-established sites: Dr. Daeschler's Red Hill site, which produces evolutionarily important forms representing the fish to tetrapod transition; and Dr. Lacovara's Inversand site, which records a mass-death assemblage at the end of the Cretaceous Period.

Additional Information

For additional information about this program, visit the Biodiversity, Earth and Environmental Science (BEES) Department website.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COM 230	Techniques of Speaking	3.0
COM 310 [WI]	Technical Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 340	Environmental Ethics	3.0
or PHIL 341	Environmental Philosophy	
UNIV S101	The Drexel Experience	1.0
UNIV S201	Looking Forward: Academics and Careers	1.0
Humanities or Social Science electives		6.0
Free electives		24.0
Mathematics and Statistics		
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
General Geology conc may take:		
MATH 101	Introduction to Analysis I	
or MATH 121	Calculus I	
MATH 102	Introduction to Analysis II	
or MATH 122	Calculus II	
MATH 239	Mathematics for the Life Sciences	
or MATH 123	Calculus III	
MATH 410	Scientific Data Analysis I	3.0
MATH 411	Scientific Data Analysis II	3.0
Physical Sciences		
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
CHEM 103	General Chemistry III	5.0
Complete one of the following Physics sequences:		12.0

PHYS 101 & PHYS 102 & PHYS 201	Fundamentals of Physics I and Fundamentals of Physics II and Fundamentals of Physics III	
PHYS 152 & PHYS 153 & PHYS 154	Introductory Physics I and Introductory Physics II and Introductory Physics III	
Complete one of the following Biological Sciences sequences:		8.0-9.0
BIO 107 & BIO 108 & BIO 109 & BIO 110	Cells, Genetics & Physiology and Cells, Genetics and Physiology Laboratory and Biological Diversity, Ecology & Evolution and Biological Diversity, Ecology and Evolution Laboratory	
BIO 124 & BIO 126	Evolution & Organismal Diversity and Physiology and Ecology	
Environmental Science		
ENVS 101	Introduction to Environmental Science	5.0
ENVS 102	Natural History, Research and Collections	2.0
ENVS 441 [WI]	Issues in Global Change I: Seminar	2.0
ENVS 442	Issues in Global Change II: Research	2.0
ENVS 443	Issues in Global Change III: Synthesis	2.0
Geoscience Core Courses		
GEO 101	Physical Geology	4.0
GEO 102	History of the Earth	4.0
GEO 103	Introduction to Field Methods in Earth Science	2.0
GEO 201 [WI]	Earth Systems Processes	3.0
GEO 215	Mineralogy	4.0
GEO 301	Advanced Field Methods in Earth Science	3.0
GEO 312	Sedimentology and Stratigraphy	3.5
GEO 320	Invertebrate Paleontology	3.5
GEO 325	Structural Geology	5.0
GEO 401	Igneous and Metamorphic Petrology	5.0
Geology Field Camp		6.0
GEO Electives [*]		6.0-8.0
Geoscience Concentration Courses		**19.0-20.0**
Applied Geology Concentration		
ENVS 308	GIS and Environmental Modeling	
GEO 306	Environmental Geology	
GEO 309	Geochemistry	
GEO 412	Geology of Groundwater	
GEO 418	Geophysics	
General Geoscience Concentration [**]		
Paleontology Concentration		
ENVS 202	Tree of Life	
GEO 322	Vertebrate Paleontology	
GEO 497	Research	
Paleontology elective (Choose 2 from following):		
ENVS 212	Evolution	
ENVS 312	Systematic Biology	
ENVS 352	Ornithology	
ENVS 354	Ichthyology	
ENVS 355	Biogeography	
ENVS 391	Freshwater and Marine Algae	
ENVS 470	Advanced Topics in Evolution	
Choose one of the following:		
BIO 224 & BIO 225	Form, Function & Evolution of Vertebrates and Vertebrate Biology and Evolution Laboratory	
ENVS 254 & ENVS 255	Invertebrate Morphology and Physiology and Invertebrate Morphology and Physiology Lab	
Total Credits		183.0-187.0

[*]   See the Biodiversity, Earth and Environmental Science (BEES) for the GEO Core and Paleo elective list.

[**]   See the Biodiversity, Earth and Environmental Science (BEES) Department for the General Geoscience Concentration course list.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

The sample plan of study is a general guideline that can be used for each of the three concentrations, depending on course selections in certain terms.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENVS 101	Introduction to Environmental Science	5.0
GEO 101	Physical Geology	4.0
MATH 121	Calculus I	4.0
UNIV S101	The Drexel Experience	1.0
	Term Credits	17.0
Term 2		
CHEM 101 or BIO 124 [*]	General Chemistry I Evolution & Organismal Diversity	3.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
GEO 102	History of the Earth	4.0
MATH 122	Calculus II	4.0
	Term Credits	15.5
Term 3		
CHEM 102 or BIO 126	General Chemistry II Physiology and Ecology	4.5
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
ENVS 102	Natural History, Research and Collections	2.0
GEO 103	Introduction to Field Methods in Earth Science	2.0
MATH 123	Calculus III	4.0
	Term Credits	15.5
Term 4		
BIO 107	Cells, Genetics & Physiology	3.0

BIO 108	Cells, Genetics and Physiology Laboratory	1.0
CHEM 103	General Chemistry III	5.0
or 101	General Chemistry I	
GEO 301	Advanced Field Methods in Earth Science	3.0
GEO 312	Sedimentology and Stratigraphy	3.5
	Term Credits	15.5
Term 5		
GEO 201 [WI]	Earth Systems Processes	3.0
GEO 215	Mineralogy	4.0
Choose one of the following two options, based on chosen concentration:		4.0
4-credit GEO concentration course		
2-credit GEO concentration (Paleo) course and a 3-credit free elective		
BIO 109	Biological Diversity, Ecology & Evolution	3.0
or CHEM 102	General Chemistry II	
BIO 110	Biological Diversity, Ecology and Evolution Laboratory	1.0
or CHEM 102	General Chemistry II	
	Term Credits	15.0
Term 6		
COM 230	Techniques of Speaking	3.0
GEO 401	Igneous and Metamorphic Petrology	5.0
PHYS 101	Fundamentals of Physics I	4.0
or 152	Introductory Physics I	
Free elective		3.0
	Term Credits	15.0
Term 7		
COM 310 [WI]	Technical Communication	3.0
GEO 325	Structural Geology	5.0
UNIV S201	Looking Forward: Academics and Careers	1.0
PHYS 102	Fundamentals of Physics II	4.0
or 153	Introductory Physics II	
Free elective		3.0
	Term Credits	16.0
Term 8		
MATH 410	Scientific Data Analysis I	3.0
PHYS 201	Fundamentals of Physics III	4.0
or 154	Introductory Physics III	
PHIL 340	Environmental Ethics	3.0
or 341	Environmental Philosophy	
GEO Concentration elective		3.0-4.0
	Term Credits	13.0-14.0
Term 9		
MATH 411	Scientific Data Analysis II	3.0
GEO Concentration courses		8.0
Free elective		3.0
Field Camp [**]		6.0
	Term Credits	20.0
Term 10		
ENVS 441 [WI]	Issues in Global Change I: Seminar	2.0
GEO 320	Invertebrate Paleontology	3.5
GEO elective		3.0-4.0
Humanities or Social Science elective		3.0
Free Elective		3.0
	Term Credits	14.5-15.5
Term 11		
ENVS 442	Issues in Global Change II: Research	2.0
GEO concentration elective		3.0-4.0
Humanities or Social Science elective		3.0
Free elective		6.0
	Term Credits	14.0-15.0
Term 12		
ENVS 443	Issues in Global Change III: Synthesis	2.0
GEO elective		3.0-4.0

Free electives	7.0
Term Credits	12.0-13.0

Total Credit: 183.0-187.0

* Choose to start CHEM or BIO sequence depending on concentration. Paleontology students should take BIO 124 & BIO 126. Students interested in applied or geochemistry should start CHEM.

** Note: Students do Field Camps during Co-Op in the Junior year. These 6.0 credits are transferred during Co-Op. Please see your advisor for additional information.

Co-Op/Career Opportunities

Co-Op Opportunities

There are over one hundred environmental, geophysical, and geotechnical firms within the greater Philadelphia region. Plus, there are opportunities with federal, state, and municipal agencies, jobs in central Pennsylvania related to the Marcellus Shale, and research opportunities between Drexel and the Academy of Natural Sciences.

All geoscience majors follow the five-year, three co-op plan of study program. Transfer students may be granted an exception for a two co-op plan of study, so that they may remain on schedule. The summer geological field camp will occur during the third co-op cycle. In this third co-op, geoscience students attend field camp and also partake in an abbreviated co-op work experience.

Career Opportunities

According to the US Bureau of Labor Statistics (BLS), employment for geoscientists through 2020 is expected to grow faster than the average for all occupations. In addition, the geosciences are expected to outpace life, physical, and social sciences in job creation. The employment outlook for geoscientists in Drexel's surrounding area is particularly bright, with a robust environmental consulting industry and exploding demand related to Marcellus Shale drilling.

The geoscience major, with its three concentrations, prepares students who are interested in entering the workforce immediately as well as those who are interested in pursuing related research in graduate schools.

Facilities and Field Sites

Facilities

The geoscience major leverages resources at Drexel University and the Academy of Natural Sciences (https://ansp.org/), such as a mineral collection with 9,000 specimens, over a million fossil specimens, Dinosaur Hall, The Patrick Center for Environmental Research, a state-of-the-art fossil preparation lab, notable research programs, and faculty with expertise in geology, paleontology, and related disciplines.

Summer Geological Field Camp

Summer geological field camp is the quintessential undergraduate experience for geosciences students. It is a long-held tradition in geology departments that students head out West, during the summer before graduation, to apply their knowledge to real-world situations and to acquire field skills that will serve them throughout their careers. This is particularly important for students in eastern schools, where the mountains are small and outcrops are scarce. Field camp also provides networking and bonding opportunity for students. Friends made at field

camp often become colleagues for life. At the Geological Society of America meeting, reunions are organized by university *and* by field camp.

The summer geological field camp for geoscience students will occur during the third co-op cycle.

Barnegat Bay Coastal Field Station

The BEES field station on Barnegat Bay in Waretown, NJ provides geoscience students with opportunities to engage in hands-on research in coastal geology, barrier island morphology, oceanography, and sedimentology. The facility includes a lodge, two classrooms/meeting rooms, dining hall, dormitories, and rustic cabins. The field station is located on 194 acres of diverse coastal habitat, including a maritime forest, tidal creek, salt marsh, fresh water pond, brackish impoundment, and bayshore environments. The department's research vessel gives students access to back-bay and near-shore marine environments.

The department holds its introductory field session for incoming freshmen and other events at the field station. The facility may also serve as a base for excursions into the Pine Barrens, a heavily forested area containing a number of interesting deposits related to the last glacial period.

Red Hill Fossil Site

The Red Hill fossil site, in Tioga County, Pennsylvania, exposes Devonian coastal sedimentary rocks that preserve a rich fossil fauna. Of particular importance is a fossil fish species, studied by Dr. Ted Daeschler, representing a critical transition between fish and tetrapods (land animals.) This site offers opportunities for studying vertebrate paleontology, stratigraphy, and sedimentology and provides students with a window into an important moment in the history of life on Earth.

Inversand Fossil Site: Local training ground for Geoscience Majors

The Inversand fossil site is a unique resource for geological education, research, and STEM outreach. The quarry is located in Gloucester Country, NJ, only 20 minutes from Drexel's campus, making it possible to conduct field exercises there within a three-hour class period. The geological formations that outcrop in the Inversand Quarry have yielded many new fossil species. The site has significance beyond vertebrate paleontology, however, and will provide a local laboratory for classes in geochemistry, geophysics, stratigraphy, sedimentology, hydrogeology, and environmental geology. As such, it will provide a valuable training-ground, a short distance from campus, for all Drexel geoscience majors.

Geoscience Faculty

Ted Daeschler, PhD *(University of Pennsylvania) Associate Curator of Vertebrate Zoology; Vice President for Systematic Biology and the Library: Academy of Natural Sciences.* Associate Professor. Vertebrate fauna of the Late Devonian Period in eastern North America; fossil collecting; systematic work focusing on freshwater vertebrates; nature of early non-marine ecosystems.

Marie J. Kurz, PhD *(University of Florida) Biogeochemistry Section Leader, Academy of Natrual Sciences.* Assistant Research Professor. Interactions between geochemical, ecological & hydrologic processes in freshwater systems. Availability, transport and cycling of stream solutes; Stream ecosystem structure & function; Groundwater-surface water interactions; Adaptive management & restoration of water resources & aquatic ecosystems.

Amanda Lough, PhD *(Washington University in St. Louis).* Assistant Professor. Volcanic seismicity and the relation to magma plumbing

systems; glacial seismicity and the seismicity of Antarctica; intraplate seismicity.

Gary Rosenberg, PhD *(Harvard University) Pilsbry Chair of Malacology.* Professor. Magnitude and origin of species-level diversity in the Mollusca.

Jocelyn A. Sessa, PhD *(Penn State University) Assistant Curator of Invertebrate Paleontology: Academy of Natural Sciences.* Assistant Professor. Paleoecology; paleobiology; extinction recovery dynamics; climate change; isotope geochemistry; fossil and modern mollusks

Loyc Vanderkluysen, PhD *(University of Hawaii).* Associate Professor. The cyclicity of volcanic eruptions, volcanic degassing processes, and large igneous provinces.

David J. Velinsky, PhD *(Old Dominion University) Department Head, Biodiversity, Earth and Environmental Science.* Professor. Geochemical cycling of organic and inorganic constituents of sediments and waters; Sedimentary diagenesis of major and minor elements; Isotope biogeochemistry of carbon, nitrogen and sulfur in marine and freshwater systems.

Global Studies

Major: Global Studies
Degree Awarded: Bachelor of Arts (BA)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 30.2001
Standard Occupational Classification (SOC) code: 19-3094

About the Program

Global Studies practices socially-responsible global citizenship through a unique combination of research-oriented and multilingual instruction, professional experience, and meaningful engagement with communities both here in Philadelphia and abroad.

Our students experience Global Studies by:

- Examining the movement of peoples, goods, and cultures across countries and regions
- Studying global issues in concrete socio-economic, cultural, and geographical contexts
- Tackling structural inequalities from a variety of perspectives and disciplines
- Developing intercultural and language skills through unique pedagogical models
- Working with employers and communities in Philadelphia and around the world through Drexel's Co-Op opportunities

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Global Media, Arts, and Cultures Concentration

General Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
ECON 201	Principles of Microeconomics	4.0

ECON 202	Principles of Macroeconomics	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PSCI 150	International Politics	4.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Two mathematics courses		6.0-8.0
Two science courses		6.0-8.0
Global Studies Core Requirements		
GST 101	Becoming Global: Language and Cultural Context	3.0
GST 102	Understanding Global: Markets and Governance	3.0
GST 103	Acting Global: Research Methods in Global Studies	3.0
Four 200+ level GST courses		12.0
GST 400	Senior Project in Global Studies	3.0
Language minor, or minor in Asian Studies, or Middle East and North African Studies		**24.0**

Students must complete at least 24 credits above the 103 language level to earn a language minor.

Media, Arts, and Cultures Distribution Requirements		
ANTH 212 [WI]	Topics in World Ethnography	3.0
ANTH 330	Media Anthropology	3.0
DIGM 100	Digital Design Tools	3.0
ENGL 325	Topics in World Literature	3.0
PHIL 305	Ethics and the Media	3.0
Select one of the following:		**3.0**
ARTH 101	History of Art I: Ancient to Medieval	
ARTH 102	History of Art II: Renaissance to Romanticism	
ARTH 103	History of Art III: Modern Art	
Media, Arts, and Cultures Distribution Options		**24.0**

Students must complete at least 24 distribution credits from the approved list

ANTH 210 [WI]	Worldview: Science, Religion and Magic	
ANTH 220	Aging In Cross-Cultural Perspective	
ANTH 250	Anthropology of Immigration	
ANTH 310	Societies In Transition: The Impact of Modernization and the Third World	
ANTH 312	Approaches to Intercultural Behavior	
ANTH 345	Visual Anthropology	
ANTH 355	Digital Culture	
ANTH 375	Digital Ethnography	
ANTH 385	Community Engaged Anthropology	
ANTH 410	Cultural Theory I	
ARCH 141	Architecture and Society I	
COM 210	Theory and Models of Communication	
COM 342	English Worldwide	
COM 345	Intercultural Communication	
COM 355	Ethnography of Communication	
COM 360	International Communication	
COM 375 [WI]	Grant Writing	
COM 376	Nonprofit Communication	
COM 385	Media Effects	
COM 390 [WI]	Global Journalism	
CULA 405 [WI]	Culture and Gastronomy I	
ENGL 200 [WI]	Classical to Medieval Literature	
ENGL 201	Renaissance to the Enlightenment	
ENGL 203 [WI]	Survey of World Literature	
ENGL 204	Post-Colonial Literature	
ENGL 300 [WI]	Literature & Science	

ENGL 323	Literature and Other Arts	
ENGL 325	Topics in World Literature	
ENGL 335	Mythology	
ENGL 355 [WI]	Women and Literature	
ENGL 360 [WI]	Literature and Society	
FMST T280	Special Topics in Film Studies	
GST 221	Introduction to Global Capital and Development	
GST 231	Introduction to Identities and Communities	
GST 241	Introduction to Power and Resistance	
GST 251	Introduction to Global Media, Arts, and Cultures	
GST 261	Introduction to Global Health and Sustainability	
GST 321	Advanced Studies in Global Capital and Development	
GST 331	Advanced Studies in Identities and Communities	
GST 341	Advanced Studies in Power and Resistance	
GST 351	Advanced Studies in Global Media, Arts, and Cultures	
GST 361	Advanced Studies in Global Health and Sustainability	
GST 435	Model Organization of American States	
GST T280	Special Topics in Global Studies	
GST T380	Special Topics in Global Studies	
MUSC 130	Introduction to Music	
MUSC 331	World Musics	
NFS 446	Perspectives in World Nutrition	
PHIL 211	Metaphysics: Philosophy of Reality	
PHIL 231	Aesthetics: Philosophy of Art	
PHIL 241	Social & Political Philosophy	
PHIL 335	Global Ethical Issues	
PHIL 391	Philosophy of Religion	
PSCI 120	History of Political Thought	
PSCI 330	Public Opinion & Propaganda	
PSCI 335	Political Communication	
SOC 210	Race, Ethnicity and Social Inequality	
SOC 340	Globalization	
WGST 240	Women and Society in a Global Context	
WRIT 310	Literary Editing & Publication	
Electives		**54.0-50.0**
Total Credits		180.0

Global Business, Economics, and Development Concentration

General Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PSCI 150	International Politics	4.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Two mathematics courses		6.0-8.0
Two science courses		6.0-8.0
Global Studies Core Requirements		
GST 101	Becoming Global: Language and Cultural Context	3.0
GST 102	Understanding Global: Markets and Governance	3.0
GST 103	Acting Global: Research Methods in Global Studies	3.0
Four 200+ level GST courses		12.0
GST 400	Senior Project in Global Studies	3.0
Language minor		**24.0**

Students must complete at least 24.0 credits above the 103 language level to earn a language minor.

Global Business, Economics, and Development Concentration Requirements

BLAW 340	International Business Law	4.0
ECON 342	Economic Development	4.0
ENGL 308 [WI]	The Literature of Business	3.0
PHIL 301	Business Ethics	3.0
PSCI 255	International Political Economy	4.0
Select one of the following		**4.0**
INTB 332	Multinational Corporations	
INTB 334	International Trade	
INTB 336	International Money and Finance	
Global Business, Economics, and Development Distribution Options		**24.0**

Students must complete at least 24.0 distribution credits from the approved list

ANTH 310	Societies In Transition: The Impact of Modernization and the Third World
ANTH 312	Approaches to Intercultural Behavior
COM 270 [WI]	Business Communication
COM 345	Intercultural Communication
COM 360	International Communication
COM 362	International Negotiations
COM 375 [WI]	Grant Writing
ECON 301	Microeconomics
ECON 321	Macroeconomics
ECON 326 [WI]	Economic Ideas
ECON 331	International Macroeconomics
ECON 351	Resource and Environmental Economics
ENGL 325	Topics in World Literature
ENGL 360 [WI]	Literature and Society
ENTP 270	Social Entrepreneurship
ENTP 370	Global Entrepreneurship
ENTP 390	Energy Entrepreneurship
FIN 301	Introduction to Finance
FIN 346	Global Financial Management
GST 221	Introduction to Global Capital and Development
GST 231	Introduction to Identities and Communities
GST 241	Introduction to Power and Resistance
GST 251	Introduction to Global Media, Arts, and Cultures
GST 261	Introduction to Global Health and Sustainability
GST 321	Advanced Studies in Global Capital and Development
GST 331	Advanced Studies in Identities and Communities
GST 341	Advanced Studies in Power and Resistance
GST 351	Advanced Studies in Global Media, Arts, and Cultures
GST 361	Advanced Studies in Global Health and Sustainability
GST 435	Model Organization of American States
GST T280	Special Topics in Global Studies
GST T380	Special Topics in Global Studies
HIST 315	History of Capitalism
INTB 332	Multinational Corporations
INTB 334	International Trade
INTB 336	International Money and Finance
INTB 338	Regional Studies in Economic Policies and International Business
MGMT 370	For-Profit Business Consulting
MGMT 371	Nonprofit Business Consulting
MKTG 201	Introduction to Marketing Management
MKTG 322	Advertising & Integrated Marketing Communications
MKTG 351	Marketing for Non-Profit Organizations
MKTG 357	Global Marketing
PSCI 351	International Organizations: The United Nations
PSCI 352	Ethics and International Relations
PSCI 357	The European Union in World Politics
SOC 220	Wealth and Power
SOC 330	Development and Underdevelopment in the Global South
SOC 340	Globalization
SOC 355 [WI]	Classical Social Theory
SOC 410	Imagining Multiple Democracies
STAT 201	Introduction to Business Statistics
STAT 202	Business Statistics II
WGST 240	Women and Society in a Global Context

Electives		**50.0-46.0**
Total Credits		180.0

Global Health and Sustainability Concentration

General Requirements

CIVC 101	Introduction to Civic Engagement	1.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PSCI 150	International Politics	4.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Two mathematics courses		6.0-8.0
Two science courses		6.0-8.0
GST Core Curriculum Requirements		
GST 101	Becoming Global: Language and Cultural Context	3.0
GST 102	Understanding Global: Markets and Governance	3.0
GST 103	Acting Global: Research Methods in Global Studies	3.0
Four 200+ level GST courses		12.0
GST 400	Senior Project in Global Studies	3.0
Language Minor		**24.0**

Students must complete at least 24.0 credits above the 103 language level to earn a language minor.

Global Health and Sustainability Concentration Requirements

ANTH 360	Culture and the Environment	3.0-4.0
or SOC 244	Sociology of the Environment	
PBHL 301	Epidemiology in Public Health	3.0
PBHL 303	Overview of Issues in Global Health	3.0
PSCI 334	Politics of Environment and Health	4.0
or SOC 346	Environmental Justice	
Choose one of the following English classes		**3.0**
ENGL 300 [WI]	Literature & Science	
ENGL 302	Environmental Literature	
ENGL 370	Topics in Literature and Medicine	
Choose one of the following Ethics courses		**3.0**
PBHL 309	Public Health Ethics	
PHIL 321	Biomedical Ethics	
PHIL 340	Environmental Ethics	
Global Health and Sustainability Distribution Options		**24.0**

Students must complete at least 24.0 distribution credits from the approved list

ANTH 210 [WI]	Worldview: Science, Religion and Magic
ANTH 265	Health & Healing Practices in Cross-Cultural Perspective
ANTH 310	Societies In Transition: The Impact of Modernization and the Third World
ANTH 360	Culture and the Environment
BIO 109	Biological Diversity, Ecology & Evolution
BIO 264	Ethnobotany

BIO 312	Genetically Modified Foods	
CJS 373	Environmental Crime	
COM 316	Campaigns for Health & Environment	
COM 317 [WI]	Environmental Communication	
COM 320 [WI]	Science Writing	
COM 375 [WI]	Grant Writing	
CULA 426	The Kitchen Garden: Summer	
CULA 427	The Kitchen Garden: Fall	
ECON 301	Microeconomics	
ECON 321	Macroeconomics	
ECON 351	Resource and Environmental Economics	
ENGL 300 [WI]	Literature & Science	
ENGL 302	Environmental Literature	
ENGL 370	Topics in Literature and Medicine	
ENSS 285	Introduction to Urban Planning	
ENSS 326	Cities and Sustainability	
ENTP 390	Energy Entrepreneurship	
ENVS 169	Environmental Science	
ENVS 247	Native Plants and Sustainability	
ENVS 275	Global Climate Change	
ENVS 289	Global Warming, Biodiversity and Your Future	
ENVS 328	Conservation Biology	
GST 221	Introduction to Global Capital and Development	
GST 231	Introduction to Identities and Communities	
GST 241	Introduction to Power and Resistance	
GST 251	Introduction to Global Media, Arts, and Cultures	
GST 261	Introduction to Global Health and Sustainability	
GST 321	Advanced Studies in Global Capital and Development	
GST 331	Advanced Studies in Identities and Communities	
GST 341	Advanced Studies in Power and Resistance	
GST 351	Advanced Studies in Global Media, Arts, and Cultures	
GST 361	Advanced Studies in Global Health and Sustainability	
GST 435	Model Organization of American States	
GST T280	Special Topics in Global Studies	
GST T380	Special Topics in Global Studies	
HIST 287	History of Science: Ancient to Medieval	
HIST 288	History of Science: Medieval to Enlightenment	
HIST 289	History of Science: Enlightenment to Modernity	
HIST 321	Themes in Global Environmental History	
HIST 322	Empire and Environment	
HIST 385	Transnational History of Science, Technology and Environment	
HSAD 312	Development of World Health Care	
HSAD 316	Health Care across Cultures	
NFS 345	Foods and Nutrition of World Cultures	
NFS 446	Perspectives in World Nutrition	
PBHL 302	Introduction to the History of Public Health	
PBHL 304	Introduction to Health & Human Rights	
PBHL 305	Women and Children: Health & Society	
PBHL 306	Introduction to Community Health	
PBHL 317	The World's Water	
PBHL 320	Exploring the HIV/AIDS Pandemic	
PBHL 321	Disease Outbreak Investigations	
PBHL 333	Health Inequality	
PHIL 321	Biomedical Ethics	
PHIL 335	Global Ethical Issues	
PHIL 340	Environmental Ethics	
PHIL 341	Environmental Philosophy	
PHIL 351	Philosophy of Technology	
PHIL 361	Philosophy of Science	
PSCI 252	Global Governance	
PSCI 284	Environmental Politics	
PSCI 305	Social Development: A Global Approach	
PSCI 334	Politics of Environment and Health	
PSCI 351	International Organizations: The United Nations	
PSCI 352	Ethics and International Relations	
PSCI 353	International Human Rights	
PSY 352	Psychology of Sustainability	
SOC 235	Sociology of Health and Illness	
SOC 315	HIV/AIDS and Africa	
SOC 330	Development and Underdevelopment in the Global South	
SOC 340	Globalization	
WGST 240	Women and Society in a Global Context	
WGST 275	Women's Health and Human Rights	

Electives	**53.0-48.0**
Total Credits	180.0

Global Justice and Human Rights Concentration

General Requirements

CIVC 101	Introduction to Civic Engagement	1.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PSCI 150	International Politics	4.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Two mathematics courses		6.0-8.0
Two science courses		6.0-8.0

GST Core Curriculum Requirements

GST 101	Becoming Global: Language and Cultural Context	3.0
GST 102	Understanding Global: Markets and Governance	3.0
GST 103	Acting Global: Research Methods in Global Studies	3.0
Four 200+ level GST courses		12.0
GST 400	Senior Project in Global Studies	3.0

Language Minor	**24.0**

Students must complete at least 24 credits above the 103 language level to earn a language minor.

Global Justice and Human Rights Distribution Requirements

ANTH 310	Societies In Transition: The Impact of Modernization and the Third World	3.0-4.0
or SOC 330	Development and Underdevelopment in the Global South	
ENGL 360 [WI]	Literature and Society	3.0
PHIL 335	Global Ethical Issues	3.0-4.0
or PSCI 352	Ethics and International Relations	
PSCI 120	History of Political Thought	4.0
or PSCI 229	Theories of Justice	
PSCI 353	International Human Rights	4.0
Select one of the following:		**3.0-4.0**
GST 435	Model Organization of American States	
PSCI 351	International Organizations: The United Nations	
PSCI 357	The European Union in World Politics	

Global Justice and Human Rights Distribution Options	**24.0**

Students must complete at least 24 distribution credits from the approved list

AFAS T280	Special Topics in Africana Studies (Course must have a global theme)
ANTH 250	Anthropology of Immigration
ANTH 312	Approaches to Intercultural Behavior
or COM 345	Intercultural Communication
CJS 260	Justice in Our Community
CJS 261	Prison, Society and You

CJS 289	Terrorism	
CJS 320	Comparative Justice Systems	
COM 360	International Communication	
COM 362	International Negotiations	
COM 375 [WI]	Grant Writing	
CULA 426	The Kitchen Garden: Summer	
or CULA 42	The Kitchen Garden: Fall	
ECON 301	Microeconomics	
ECON 321	Macroeconomics	
ECON 342	Economic Development	
ECON 351	Resource and Environmental Economics	
ENGL 325	Topics in World Literature	
GST 221	Introduction to Global Capital and Development	
GST 231	Introduction to Identities and Communities	
GST 241	Introduction to Power and Resistance	
GST 251	Introduction to Global Media, Arts, and Cultures	
GST 261	Introduction to Global Health and Sustainability	
GST 321	Advanced Studies in Global Capital and Development	
GST 331	Advanced Studies in Identities and Communities	
GST 341	Advanced Studies in Power and Resistance	
GST 351	Advanced Studies in Global Media, Arts, and Cultures	
GST 361	Advanced Studies in Global Health and Sustainability	
GST 435	Model Organization of American States	
GST T280	Special Topics in Global Studies	
GST T380	Special Topics in Global Studies	
HIST 385	Transnational History of Science, Technology and Environment	
PHIL 241	Social & Political Philosophy	
PHIL 335	Global Ethical Issues	
PHIL 341	Environmental Philosophy	
PHIL 385	Philosophy of Law	
PHIL 391	Philosophy of Religion	
PBHL 303	Overview of Issues in Global Health	
PBHL 304	Introduction to Health & Human Rights	
PSCI 229	Theories of Justice	
PSCI 240	Comparative Politics II	
PSCI 250	American Foreign Policy	
PSCI 252	Global Governance	
PSCI 255	International Political Economy	
PSCI 260 [WI]	Power in Protest: Social Movements in Comparative Perspective	
PSCI 305	Social Development: A Global Approach	
PSCI 325	Political Theory from Below	
PSCI 351	International Organizations: The United Nations	
PSCI 352	Ethics and International Relations	
PSCI 357	The European Union in World Politics	
PSCI 360	International Law	
PSCI 361	The Politics of LGBT Movements and Rights	
SOC 210	Race, Ethnicity and Social Inequality	
SOC 220	Wealth and Power	
SOC 315	HIV/AIDS and Africa	
SOC 340	Globalization	
SOC 346	Environmental Justice	
SOC 355 [WI]	Classical Social Theory	
SOC 444	Social Movements	
WGST 240	Women and Society in a Global Context	
WGST T280	Special Topics in Women's and Gender Studies (Course must have a global theme)	
Electives		**52.0-45.0**
Total Credits		180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Global Media, Arts, and Cultures Concentration

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
GST 101	Becoming Global: Language and Cultural Context	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV H101	The Drexel Experience	1.0
Language course		4.0
	Term Credits	15.0
Term 2		
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
GST 102	Understanding Global: Markets and Governance	3.0
MATH 102	Introduction to Analysis II	4.0
Language course		4.0
	Term Credits	14.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
GST 103	Acting Global: Research Methods in Global Studies	3.0
PSCI 150	International Politics	4.0
Language course		4.0
	Term Credits	15.0
Term 4		
ECON 201	Principles of Microeconomics	4.0
Language course		4.0
Free elective		3.0
GST 200+ course		3.0

MAC concentration requirement		3.0
	Term Credits	17.0
Term 5		
ECON 202	Principles of Macroeconomics	4.0
Language course		4.0
Science elective		3.0
MAC Distribution course		3.0
Free elective		3.0
	Term Credits	17.0
Term 6		
Language course		4.0
Free elective		3.0
GST 200+ level course		3.0
MAC Distrubtion course		3.0
MAC concentration required course		3.0
	Term Credits	16.0
Term 7		
Language course		3.0
MAC Distribution course		3.0
MAC concentration required course		3.0
Science elective		4.0
Free elective		3.0
	Term Credits	16.0
Term 8		
Language course		3.0
MAC Distribution course		3.0
GST 200+ level course		3.0
Free electives		6.0
	Term Credits	15.0
Term 9		
Language course		3.0
MAC concentration required course		3.0
MAC Distribution course		3.0
Free elective		3.0
MAC distribution course		3.0
	Term Credits	15.0
Term 10		
UNIV H201	Looking Forward: Academics and Careers	1.0
Language course		3.0
MAC concentration required course		3.0
Free elective		3.0
GST 200+ level course		3.0
	Term Credits	13.0
Term 11		
GST 400	Senior Project in Global Studies	3.0
MAC Distribution course		3.0
Free electives		6.0
MAC concentration required course		3.0
	Term Credits	15.0
Term 12		
MAC Distribution course		3.0
Free electives		9.0
	Term Credits	12.0

Total Credit: 180.0

Global Business, Economics and Development Concentration

Term 1		**Credits**
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
GST 101	Becoming Global: Language and Cultural Context	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV H101	The Drexel Experience	1.0
Language course		4.0
	Term Credits	15.0
Term 2		
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
GST 102	Understanding Global: Markets and Governance	3.0
MATH 102	Introduction to Analysis II	4.0
Language course		4.0
	Term Credits	14.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
GST 103	Acting Global: Research Methods in Global Studies	3.0
PSCI 150	International Politics	4.0
Language course		4.0
	Term Credits	15.0
Term 4		
ECON 201	Principles of Microeconomics	4.0
Language course		4.0
BED Distribution course		3.0
200+ level GST course		3.0
Free elective		3.0
	Term Credits	17.0
Term 5		
ECON 202	Principles of Macroeconomics	4.0
Language course		4.0
Free elective		3.0
Science		3.0
BED concentration required course		3.0
	Term Credits	17.0
Term 6		
Language course		4.0
Free elective		3.0
BED concentration required course		4.0
GST 200+ level course		3.0
	Term Credits	14.0
Term 7		
Language course		3.0
BED Distribution course		3.0
Free elective		3.0
Science elective		3.0
BED concentration required course		4.0
	Term Credits	16.0
Term 8		
Language course		3.0
Free elective		3.0
BED concentration required course		4.0
GST 200+ level course		3.0
BED Distribution course		3.0
	Term Credits	16.0
Term 9		
Language course		3.0
BED Distribution courses		6.0
Free elective		3.0
BED concentration required course		4.0
	Term Credits	16.0
Term 10		
UNIV H201	Looking Forward: Academics and Careers	1.0

Language course		3.0
BED concentration required course		3.0
GST 200+ level course		3.0
BED distribution option		3.0
Free elective		3.0
	Term Credits	16.0
Term 11		
GST 400	Senior Project in Global Studies	3.0
BED Distribution course		3.0
Free electives		6.0
	Term Credits	12.0
Term 12		
BED Distribution course		3.0
Free elective		9.0
	Term Credits	12.0

Total Credit: 180.0

Global Health & Sustainability Concentration

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
GST 101	Becoming Global: Language and Cultural Context	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV H101	The Drexel Experience	1.0
Language course		4.0
	Term Credits	15.0
Term 2		
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
GST 102	Understanding Global: Markets and Governance	3.0
MATH 102	Introduction to Analysis II	4.0
Language course		4.0
	Term Credits	14.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
GST 103	Acting Global: Research Methods in Global Studies	3.0
PSCI 150	International Politics	4.0
Language course		4.0
	Term Credits	15.0
Term 4		
ECON 201	Principles of Microeconomics	4.0
Language course		4.0
GHS distribution option		3.0
GHS concentration required course		3.0
200+ level GST course		3.0
	Term Credits	17.0
Term 5		
ECON 202	Principles of Macroeconomics	4.0
GHS distribution option		3.0
Language course		4.0
Science elective		3.0
GHS concentration required course		3.0
	Term Credits	17.0
Term 6		
GHS distribution option		3.0
GST 200+ level course		3.0
GHS concentration requierd course		4.0
Language course		4.0

Free elective		3.0
	Term Credits	17.0
Term 7		
GHS distribution option		3.0
Language course		3.0
Science elective		3.0
Free elective		3.0
GHS concentration required course		3.0
	Term Credits	15.0
Term 8		
Language course		3.0
GST 200+ level course		3.0
Free electives		6.0
GHS distribution option		3.0
	Term Credits	15.0
Term 9		
GHS distribution option		3.0
Language course		3.0
Free electives		6.0
GHS concentration required course		3.0
	Term Credits	15.0
Term 10		
UNIV H201	Looking Forward: Academics and Careers	1.0
GHS concentration required course		3.0
200+ level GST course		3.0
GHS distribution option		3.0
Language course		3.0
Free elective		3.0
	Term Credits	16.0
Term 11		
GST 400	Senior Project in Global Studies	3.0
GHS distribution option		3.0
Free elective		6.0
	Term Credits	12.0
Term 12		
GHS distribution option		3.0
Free electives		9.0
	Term Credits	12.0

Total Credit: 180.0

Global Justice and Human Rights Concentration

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
GST 101	Becoming Global: Language and Cultural Context	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV H101	The Drexel Experience	1.0
Language course		4.0
	Term Credits	15.0
Term 2		
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
GST 102	Understanding Global: Markets and Governance	3.0
MATH 102	Introduction to Analysis II	4.0
Language course		4.0
	Term Credits	14.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0

Course	Title	Credits
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
GST 103	Acting Global: Research Methods in Global Studies	3.0
PSCI 150	International Politics	4.0
Language course		4.0
	Term Credits	**15.0**
Term 4		
ECON 201	Principles of Microeconomics	4.0
Language course		4.0
JHR Distribution course		3.0
JHR concentration required course		3.0
200+ level GST course		3.0
	Term Credits	**17.0**
Term 5		
ECON 202	Principles of Macroeconomics	4.0
Language course		4.0
Science elective		3.0
Free elective		3.0
JHR concentration required course		3.0
	Term Credits	**17.0**
Term 6		
Language course		4.0
GST 200+ level course		3.0
Free elective		3.0
JHR concentration required course		3.0
JHR distribution course		3.0
	Term Credits	**16.0**
Term 7		
Language course		3.0
JHR Distribution course		3.0
JHR concentration required course		4.0
Free elective		3.0
Science elective		3.0
	Term Credits	**16.0**
Term 8		
Language course		3.0
JHR Distribution course		3.0
GST 200+ level course		3.0
Free electives		6.0
	Term Credits	**15.0**
Term 9		
Language course		3.0
JHR Distribution course		3.0
Free elective		6.0
JHR concentration required course		3.0
	Term Credits	**15.0**
Term 10		
UNIV H201	Looking Forward: Academics and Careers	1.0
200+ level GST course		3.0
Language course		3.0
JHR Distribution course		3.0
JHR concentration required course		3.0
Free elective		3.0
	Term Credits	**16.0**
Term 11		
GST 400	Senior Project in Global Studies	3.0
JHR Distribution course		3.0
Free electives		6.0
	Term Credits	**12.0**
Term 12		
JHR Distriubtion course		3.0
Free electives		9.0
	Term Credits	**12.0**

Total Credit: 180.0

Global Studies Faculty

Anne Cecil, MA *(University of the Arts)*. Adjunct Instructor. Web designer, product designer, merchandising and artist.

Rose Corrigan, PhD *(Rutgers University) Director of the Center for Law, Policy, and Social Action*. Associate Professor. Women, public law, American politics and policy.

Brenda Dyer, MA *(University of Pennsylvania)*. Associate Teaching Professor. Language acquisition pedagogy, teaching writing, seventeenth and eighteenth century French literature, women writers, translation.

Mary Ebeling, PhD *(University of Surrey) Director, Women's and Gender Studies*. Associate Professor. Science and technology studies; emerging technologies and biocapital; media and democratic cultures; radical social movements; sociology of markets; political sociology; and ethnographic methodologies.

Christian Hunold, PhD *(University of Pittsburgh)*. Professor. Environmental policy; comparative politics; urban wildlife; political theory.

Gabriella Ibieta, PhD *(City University of New York) Director, Programs in English*. Associate Professor. Comparative literature; Cuban and Latin American fiction.

Emmanuel F. Koku, PhD *(University of Toronto)*. Associate Professor. Social network analysis; qualitative/quantitative research; medical sociology; social epidemiology; social demography; sociology of development; communication and information technology; community and urban sociology.

Christopher A. Laincz, PhD *(Duke University)*. Associate Professor. Economic development, technological change, and growth, industrial organization, macroeconomics and monetary economics.

Nada Matta, PhD *(New York University)*. Assistant Professor. Political Economy, Social Movements, Middle East Studies, Gender Studies, Revolutions, Inequality.

Maria delaluz Matus-Mendoza, PhD *(Temple University) Language Program Coordinator*. Associate Professor. Spanish Linguistic variation in the US; the relationship between language variation and mobility (social and geographical) among the Mexican communities in Mexico and in the United States; second language acquisition; language variation in media.

Usha Menon, PhD *(University of Chicago)*. Professor. Self, identity & personhood, emotional functioning, Hindu morality, gender relations in Hindu society, adult development, popular Hinduism, post-colonial feminism, Hindu religious nationalism and Islamic radicalism.

Rogelio Minana, PhD *(Penn State) Department Head, Global Studies and Modern Languages*. Professor. The role of classic cultural icons, particularly Don Quixote, in 21st century political and social justice discourse; the interplay between the traditional humanities, youth organizations, and digital storytelling.

Joel E. Oestreich, PhD *(Brown University) Director of the Global Studies major*. Professor. International organizations, international finance, development, and human rights.

Rakhmiel Peltz, PhD *(University of Pennsylvania).* Professor. Judaic studies, Yiddish culture and linguistics, ethnography of communication, immigrant cultural studies.

Abioseh Porter, PhD *(University of Alberta, Canada).* Professor. Comparative literature; postcolonial literatures

Robert Powell, PhD *(Temple University).* Assistant Teaching Professor. Early and Middle Bronze Age Crete; archaeoastronomy; early state formation; archaeology and anthropology of frontiers; mass communication.

Rachel R. Reynolds, PhD *(University of Illinois).* Associate Professor. Sociolinguistics, ethnography of communication and discourse analysis; violence against women in mass media; political economy of migration; semiotics including the textual, the visual and multimodal.

Simone Schlichting-Artur, EdD *(University of Pennsylvania) Senior Assistant Dean of Global Initiatives.* Teaching Professor. International business communication (Germany and the U.S.), public health policy and languages, German post-war history through film and literature, development of writing assessment tools for German minor.

Wesley Shumar, PhD *(University of Pennsylvania).* Professor. Digital media and learning; culture of higher education; entrepreneurship education; craft culture; semiotic of consumer culture.

Alden Young, PhD *(Princeton University) Director of the Program in Africana Studies.* Assistant Professor. African history; economic history and the history of Arab and African interactions.

Jennifer Yusin, PhD *(Emory University).* Associate Professor. Postcolonial literature; trauma theory; literary theory; psychoanalysis, and memory studies in contemporary literature in English.

Emeritus Faculty

Julie Mostov, PhD *(New York University).* Professor Emeritus. Modern political thought, democratic theory, nationalism, gender studies, South Eastern Europe and the Balkans.

History

Major: History
Degree Awarded: Bachelor of Arts (BA)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 54.0101
Standard Occupational Classification (SOC) code: 19-3093

About the Program

The history program reflects the strengths of Drexel University, including specialization in transnational history and in the history of science, technology and the environment. A series of required courses in history build skills in research and interpretation of the past while elective courses within and outside the history program allow students to shape their curriculum to meet their needs and interests. Our history graduates go to graduate school in history, to professional schools in law, medicine, and business, and to work in business, government agencies, and non-profit organizations.

We apply Drexel's experiential, research-intensive approach to the discipline of history. Using the extensive historical resources of Philadelphia, the region, and the digital world, students develop a profound understanding of history and the ways it is made. We also encourage students to enrich their education through co-op, study abroad, and summer research projects working alongside department faculty.

Degree Offered

The **Bachelor of Arts (BA)** provides a course of study that includes foreign language courses and a broad grounding in the liberal arts, with flexibility for students to choose courses to fulfill humanities, social science, math, and science requirements that will contribute to their overall educational and career plans.

The History (p. 149) minor (p. 149) allows students in other majors to explore the historical background of their discipline, to better understand the origins of the contemporary world, and to build the knowledge and skills needed to understand the development of human societies over time and to understand historical episodes into their proper contexts. The minor in History is highly flexible and allows students to choose those History courses which appeal to them and which will contribute to their broader education. To complete the minor, students must take a total of six History courses (24.0 credits), five of which must be at the 200-level or above.

Additional Information

For more information about this program, please visit the Department of History (http://drexel.edu/history/) website or contact:

Jonathan Seitz, PhD
Assistant Department Head
Teaching Professor of History
jwseitz@drexel.edu

Degree Requirements (BA)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV H101	The Drexel Experience	1.0
CIVC 101	Introduction to Civic Engagement	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Math courses		6.0-8.0
Science courses [*]		6.0-8.0
Foundation Requirements		
Diversity electives		6.0
Two Consecutive Foreign Language courses (must complete level 201)		7.0-8.0
Humanities/Fine Arts electives		12.0
Social Science electives		12.0
International Studies electives		6.0
Core History Requirements		**32.0**
HIST 101	Introductory Seminar in History I [**]	

HIST 102	Introductory Seminar in History II **	
HIST 296	Research Methods in History I **	
HIST 301	The Study of History **	
HIST 396	Research Methods in History II **	
HIST 490 [WI]	Senior Seminar I **	
HIST 491 [WI]	Senior Seminar II **	
	Any 1 Advanced History Seminar (Topics will vary)	
HIST T380	Special Topics in History	
History Distribution Courses***		20.0
	Any 2 non-U.S. History courses	
	Any 1 U.S. History Course	
	Any 1 History courses covering pre-1700 history (May not be HIST 201)	
	Any 1 History of Science, Technology, and Environment course	
History Concentration courses or any 7 History courses (at least four must be 200-level and above)		28.0
Free electives ****		33.0
Total Credits		180.0-185.0

* Any Biology (BIO), Chemistry (CHEM), Nutrition (NFS), Physics (PHYS), Geoscience (GEO), Environmental Science (ENVS), or Physics-Environmental Science (PHEV).

** These courses must be taken in sequence.

*** Only 200-level and above HIST courses will fulfill this this requirement.

**** 33 credits is the minimum allowed. Variations in concentration requirements and actual elective choices may result in earning more free elective credits.

Optional History Concentrations

Students may select one of the two following concentrations in the History BA, or they may elect not to undertake a concentration. The courses in the required history distribution list may count toward the 28.0 credits in a concentration; the courses in the required core sequence may not count toward the 28.0 credits in the concentration.

History of Science, Technology, and Environment Concentration

HIST 302	The Study of Science, Technology, and Environment in History	4.0
Select 1 Environmental History course from the following list:		4.0
HIST 280	History of Science: Ancient to Medieval	
HIST 320	Disaster in Global History	
HIST 321	Themes in Global Environmental History	
HIST T380	Special Topics in History (with approval when appropriate topic offered)	
Select 1 Transnational Histories of Science and Technology course from the following list:		4.0
HIST T280	Special Topics in History (with approval when appropriate topic offered)	
HIST 290	Technology and the World Community	
HIST T380	Special Topics in History (with approval when appropriate topic offered)	
HIST 385	Transnational History of Science, Technology and Environment	
Select 1 History of Medicine and Disabilities course from the following list:		4.0
HIST T280	Special Topics in History (with approval when appropriate topic offered)	
HIST T380	Special Topics in History (with approval when appropriate topic offered)	
HIST 340	History of Bodies in Science, Technology, and Medicine	
HIST 341	Disabilities in History	
Concentration Electives (select three from the following list)		12.0
HIST T280	Special Topics in History (with approval when appropriate topic offered)	
HIST 283	Technology and Identity	

HIST 285	Technology in Historical Perspective	
HIST 287	History of Science: Ancient to Medieval	
HIST 288	History of Science: Medieval to Enlightenment	
HIST 289	History of Science: Enlightenment to Modernity	
HIST 290	Technology and the World Community	
HIST 291	Global History of Engineering	
HIST 292	Technology in American Life	
HIST 320	Disaster in Global History	
HIST 321	Themes in Global Environmental History	
HIST 322	Empire and Environment	
HIST 340	History of Bodies in Science, Technology, and Medicine	
HIST 341	Disabilities in History	
HIST 365	Science and State Power: Colonialism	
HIST T380	Special Topics in History (with approval when appropriate topic offered)	
Total Credits		28.0

Global History Concentration

HIST 303	The Study of Global History	4.0
Global Engagement Course †		4.0
One Foreign Language Course ††		3.0-4.0
Concentration Electives (select any four from the following list) †††		16.0
HIST 235	The Great War, 1914-1918	
HIST 236	World War II	
HIST 246	England from Elizabeth to Waterloo, 1558-1815	
HIST 247	Modern England, 1815 - present	
HIST 250	European Revolutionary Movements and Ideology, 1815-1914	
HIST 251	Fascism	
HIST 254	Russian History Before 1900	
HIST 255	Twentieth Century Russia & the USSR	
HIST 256	Germany & the World of Hitler	
HIST 257	The Reformation Age	
HIST 258	History of Europe in the 19th Century	
HIST 259	History of Europe in the 20th Century	
HIST 261	Making of Modern South Asia	
HIST 263	The World and China	
HIST 264	East Asia in Modern Times	
HIST 267	Twentieth Century World I	
HIST 268	Twentieth Century World II	
HIST 270 [WI]	Introduction to Latin American History	
HIST 271	History of Mexico	
HIST 274	Conquest of Mexico	
HIST T280	Special Topics in History (with approval when appropriate topic offered)	
HIST 290	Technology and the World Community	
HIST 291	Global History of Engineering	
HIST 315	History of Capitalism	
HIST 320	Disaster in Global History	
HIST 321	Themes in Global Environmental History	
HIST 322	Empire and Environment	
HIST 355	Venice and the Mediterranean from the Middle Ages to Napoleon	
HIST 365	Science and State Power: Colonialism	
HIST T380	Special Topics in History (with approval when appropriate topic offered)	
HIST 385	Transnational History of Science, Technology and Environment	
Total Credits		27.0-28.0

† Courses which may fulfill the global engagement requirement include designated travel-integrated courses, study abroad courses (with approval), Global Classroom courses in history, or independent study courses (with approval.)

†† In addition to the required CoAS Foundation Requirements foreign language courses (two courses, including completion of a language through 201) in one language, students in the global history concentration must take at least one courses in a second foreign language.

††† At least two courses must be 300-level and above.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study (BA)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

History BA - No concentration

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
HIST 101	Introductory Seminar in History I	4.0
UNIV H101	The Drexel Experience	1.0
Foreign language course (103-level or higher)		4.0
Non-US History Courses[*]		4.0
	Term Credits	16.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
HIST 102	Introductory Seminar in History II	4.0
Foreign language course (201-level or higher)		3.0-4.0
Mathematics course		3.0-4.0
	Term Credits	14.0-16.0
Term 3		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
U.S History course[*]		4.0
Mathematics course		3.0-4.0
Free elective		3.0-4.0
	Term Credits	13.0-15.0

Term 4		
HIST 296	Research Methods in History I	4.0
Science elective[***]		3.0-4.0
History course covering pre-1700 history[**]		4.0
Free elective		3.0-4.0
	Term Credits	14.0-16.0
Term 5		
History of Science, Technology, and Environment course[*]		4.0
Humanities/fine arts elective		3.0
Social and behavioral science elective		3.0
Science elective[***]		3.0-4.0
Free elective		3.0-4.0
	Term Credits	16.0-18.0
Term 6		
Non-U.S. History course[*]		4.0
Humanities/fine arts elective		3.0
Social and behavioral science elective		3.0
Free electives		6.0
	Term Credits	16.0
Term 7		
History electives[†]		8.0
International studies elective		3.0
Diversity elective		3.0
Free elective		3.0-4.0
	Term Credits	17.0-18.0
Term 8		
HIST 301	The Study of History	4.0
UNIV H201	Looking Forward: Academics and Careers	1.0
History elective[†]		4.0
Social and behavioral science elective		3.0
International studies elective		3.0
	Term Credits	15.0
Term 9		
HIST 396	Research Methods in History II	4.0
HIST T380	Special Topics in History	4.0
History elective[†]		4.0
Humanities/fine arts elective		3.0
Free elective		3.0-4.0
	Term Credits	18.0-19.0
Term 10		
HIST 490 [WI]	Senior Seminar I	4.0
History elective[†]		4.0
Social and behavioral sciences elective		3.0
Free elective		3.0-4.0
	Term Credits	14.0-15.0
Term 11		
HIST 491 [WI]	Senior Seminar II	4.0
History elective[†]		4.0
Humanities/fine arts elective		3.0
Free elective		3.0-4.0
	Term Credits	14.0-15.0
Term 12		
History elective[†]		4.0
Free electives		9.0-11.0
	Term Credits	13.0-15.0

Total Credit: 180.0-194.0

* Must be 200-level or above.

** Must be 200-level or above. May not be HIST 201.

***   See degree requirements (p.   ).

†   At least four core courses must be 200-level or above.

History BA - Science, Technology, and Environment Concentration

Term 1		Credits
HIST 101	Introductory Seminar in History I	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
UNIV H101	The Drexel Experience	1.0
Non-US History course[*]		4.0
Foreign language course (103-level or higher)		4.0
	Term Credits	16.0
Term 2		
HIST 102	Introductory Seminar in History II	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
CIVC 101	Introduction to Civic Engagement	1.0
Foreign language course (201-level or higher)		3.0-4.0
Mathematics course		3.0-4.0
	Term Credits	14.0-16.0
Term 3		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
US History course[*]		4.0
Mathematics course		3.0-4.0
Free elective		6.0-7.0
	Term Credits	16.0-18.0
Term 4		
HIST 296	Research Methods in History I	4.0
Concentration elective		4.0
Diversity elective		3.0
Free electives		6.0-7.0
	Term Credits	17.0-18.0
Term 5		
HIST 385	Transnational History of Science, Technology and Environment	4.0
Concentration elective		4.0
Diversity elective		3.0
Social or behavioral science elective		3.0
Free elective		3.0-4.0
	Term Credits	17.0-18.0
Term 6		
Non-US History course[*]		4.0
History course covering pre-1700 history[**]		4.0
Science elective[***]		3.0-4.0
Social or behavioral sciences elective		3.0
	Term Credits	14.0-15.0
Term 7		
History of Science, Technology, and Environment course[*]		4.0
Science elective[***]		3.0-4.0
Social or behavioral science elective		3.0
International studies elective		3.0
Free elective		3.0-4.0
	Term Credits	16.0-18.0
Term 8		
HIST 301	The Study of History	4.0
HIST T380	Special Topics in History	4.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Social or behavioral science elective		3.0
International studies elective		3.0
	Term Credits	15.0
Term 9		
HIST 302	The Study of Science, Technology, and Environment in History	4.0
HIST 396	Research Methods in History II	4.0
Humanities/fine arts elective		3.0
Free elective		3.0-4.0
	Term Credits	14.0-15.0
Term 10		
HIST 490 [WI]	Senior Seminar I	4.0
History of Medicine and Disabilities course		4.0
Humanities/fine arts elective		3.0
Free elective		3.0-4.0
	Term Credits	14.0-15.0
Term 11		
HIST 491 [WI]	Senior Seminar II	4.0
Environmental History course		4.0
Humanities/fine arts elective		3.0
Free elective		3.0-4.0
	Term Credits	14.0-15.0
Term 12		
Concentration elective		4.0
Humanities/fine arts elective		3.0
Free electives		7.0-9.0
	Term Credits	14.0-16.0

Total Credit: 181.0-195.0

*   Must be 200-level or above.

**   Must be 200-level or above. May not be HIST 201.

***   See degree requirements (p.   ).

History BA - Global History Concentration

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
HIST 101	Introductory Seminar in History I	4.0
UNIV H101	The Drexel Experience	1.0
Foreign language course (103-level or above)		4.0
Non-US History course[*]		4.0
	Term Credits	16.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
HIST 102	Introductory Seminar in History II	4.0
Foreign language course (201-level or above)		3.0-4.0
Mathematics course		3.0-4.0
	Term Credits	14.0-16.0
Term 3		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
US History course[*]		4.0
Mathematics course		3.0-4.0
Free elective		6.0-7.0
	Term Credits	16.0-18.0
Term 4		
HIST 296	Research Methods in History I	4.0
Concentration elective[**]		4.0
Diversity elective		3.0
Free electives		6.0-7.0
	Term Credits	17.0-18.0
Term 5		

Concentration elective[**]		4.0
Foreign language concentration requirement		4.0
Diversity elective		3.0
Social or behavioral science elective		3.0
	Term Credits	14.0
Term 6		
History of Science, Technology, and Environment course[*]		4.0
History course covering pre-1700 history[***]		4.0
Global Engagement course[†]		4.0
Science elective[†]		3.0-4.0
	Term Credits	15.0-16.0
Term 7		
Non-US History course[*]		4.0
Science elective[†]		3.0-4.0
Social or behavioral science elective		3.0
International studies elective		3.0
Free elective		3.0-4.0
	Term Credits	16.0-18.0
Term 8		
HIST 301	The Study of History	4.0
HIST T380	Special Topics in History	4.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Social or behavioral science elective		3.0
International studies elective		3.0
	Term Credits	15.0
Term 9		
HIST 303	The Study of Global History	4.0
HIST 396	Research Methods in History II	4.0
Social behavioral science elective		3.0
Humanities/fine arts elective		3.0
Free elective		3.0-4.0
	Term Credits	17.0-18.0
Term 10		
HIST 490 [WI]	Senior Seminar I	4.0
Concentration elective[**]		4.0
Humanities/fine arts elective		3.0
Free elective		3.0-4.0
	Term Credits	14.0-15.0
Term 11		
HIST 491 [WI]	Senior Seminar II	4.0
Humanities/fine arts elective		3.0
Free electives		6.0-8.0
	Term Credits	13.0-15.0
Term 12		
Concentration elective[**]		4.0
Humanities/fine arts elective		3.0
Free electives		6.0-8.0
	Term Credits	13.0-15.0

Total Credit: 180.0-194.0

[*]   Must be 200-level or above.

[**]   Two must be 200-level or above.

[***]   Must be 200-level or above. May not be HIST 201.

[†]   See degree requirements (p.   ).

Co-Op/Career Opportunities

Co-Op Experiences

History majors have a wide variety of co-op experiences from which to choose. Business and public utilities offer many possibilities, and local, state, and federal governments; museums and archives; and law firms present many additional interesting co-op placements. Pre-law students, for example, are especially eager to see the inside of a law office, whether the co-op job they receive is clerical or a more challenging paralegal assignment. These practical experiences in the "real" world can reinforce the lessons of the classroom, sharpen skills, and establish important contacts. Sample co-op positions include:

- Law clerk/paralegal, Joe Davidson, Attorney-at-Law, Philadelphia
- Research analyst, Legislative Office for Research Liaison, Harrisburg, PA
- Legislative intern, Corporate Public Affairs Division, Philadelphia Electric Company
- Assistant lobbyist, Government Relations Office, Drexel University
- Education intern, Philadelphia Museum of Art
- Researcher, Philadelphia Chamber of Commerce
- Assistant, Office of the Governor, Harrisburg, PA

Career Opportunities

The flexible programs allow students to shape a curriculum that meets their needs, whether they are preparing for the business world, graduate school in history or political science, the MS in Science, Technology, and Society program (http://catalog.drexel.edu/graduate/collegeofartsandsciences/sciencetechnologyandsociety/), an MBA or other business program, or law school.

History Faculty

Lloyd Ackert, PhD *(Johns Hopkins University).* Teaching Professor. History of science and technology; ecology; Russian science.

Debjani Bhattacharyya, PhD *(Emory University).* Associate Professor. Urban history, South Asian history, environmental history, legal history, transnational history, post-colonial theory, subaltern studies, history of modern economic thought and feminist history.

Yeonsil Kang, PhD *(Korea Advanced Institute of Science and Technology).* Visiting Assistant Professor. Science and technology studies, history of technology, environmental history.

Alison Kenner, PhD *(Rensselaer Polytechnic Institute).* Associate Professor. Science, technology, and health; environmental health problems; cities and place; feminist theory; medical anthropology; digital humanities

Scott G. Knowles, PhD *(Johns Hopkins University) Department Head, History.* Professor. Urban history, Philadelphia history, history of technology, history of disasters, modern history.

Jonson Miller, PhD *(Virginia Tech).* Teaching Professor. Science and technology, American history, military history.

Toni Pitock, PhD *(University of Delaware) Co-director, Judaic Studies Program.* Assistant Teaching Professor. Atlantic World, Jewish Migration and Diaspora, Economic Culture, Trade Networks, Colonial American History

Nic John Ramos, PhD *(University of Southern California).* Assistant Professor. African American History, history of Medicine, History of Psychiatry, urban History, 20th Century US History, History of Racial Capitalism, History of Sexuality

Rosalind Remer, PhD *(University of California, Las Angeles) Vice Provost & Executive Director, Lenfest Center for Cultural Partnerships;*

Affiliated Faculty Member. History of the Book, Early American economic and business history, Public History, Museum planning, Non-profit Management

Tiago Saraiva, PhD *(Universidad Autónoma de Madrid)*. Associate Professor. History of science and technology; transnational history; environmental history

Jonathan Seitz, PhD *(University of Wisconsin) Assistant Department Head, History*. Teaching Professor. History of religion, science, medicine, witchcraft, early modern Europe, Italy.

Amy Slaton, PhD *(University of Pennsylvania)*. Professor. History of science and technology; history of standards and metrology; intersectionality, race, labor.

Kathryn Steen, PhD *(University of Delaware)*. Associate Professor. History of technology, history of industry and business, and comparative history.

Donald F. Stevens, PhD *(University of Chicago)*. Professor. Modern Latin American history.

Alden Young, PhD *(Princeton University) Director of the Program in Africana Studies*. Assistant Professor. African history; economic history and the history of Arab and African interactions.

Michael Yudell, MPH, PhD *(Columbia University) Chair, Department of Community Health*. Associate Professor. Department of Community Health and Prevention. Public health ethics; history of public health; race and racism; autism.

Emeritus Faculty

Eric Dorn Brose, PhD *(Ohio State University)*. Professor Emeritus. German and European history.

Robert Zaller, PhD *(Washington University)*. Professor Emeritus. English history and early modern European history.

Mathematics

Major: Mathematics
Degree Awarded: Bachelor of Arts (BA) or Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 181.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 27.0101
Standard Occupational Classification (SOC) code: 15-2021

About the Program

The mathematics major at Drexel provides a supportive learning environment in which students obtain a firm grounding in the core areas of mathematics and apply this knowledge to problems encountered in a technological society. The Department of Mathematics (http://drexel.edu/coas/academics/departments-centers/mathematics/) offers students the option of either a BA or a BS degree.

The Mathematics Department takes pride in offering a balanced and flexible curriculum. Three very different kinds of skills are emphasized in the mathematics major:

Abstract Reasoning

All students majoring in mathematics take courses that emphasize abstract reasoning. Students read and write proofs, and graduate well prepared to enter a PhD program in mathematics.

Computing

All students majoring in mathematics take a series of computing courses. This emphasis on computing is one of the distinctive features of the mathematics program at Drexel, and provides students with a competitive advantage in the job market.

Mathematical Modeling

All students majoring in mathematics take multidisciplinary courses that focus on the interplay between mathematics and an area of application. Students often use electives to focus on an area of personal interest. The Department of Mathematics encourages students to minor in a subject where mathematics is applied. The Department provides an advisor to assist students in selecting electives and planning career paths.

Degree Requirements (BA)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COM 230	Techniques of Speaking	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV S101	The Drexel Experience	1.0
UNIV S201	Looking Forward: Academics and Careers	1.0
Computer Science sequence:		**9.0**
CS 150	Computer Science Principles	
or CS 164	Introduction to Computer Science	
CS 171	Computer Programming I	
CS 172	Computer Programming II	
Humanities and fine arts electives		6.0
International studies electives		6.0
Science electives		6.0
Social and behavioral sciences electives		6.0
Studies in diversity electives		6.0
Free Electives		**67.0**
Core Mathematics Requirements		
MATH 121	Calculus I [*]	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
MATH 200	Multivariate Calculus	4.0
MATH 201	Linear Algebra	4.0
MATH 210	Differential Equations	4.0
MATH 220 [WI]	Introduction to Mathematical Reasoning	3.0
MATH 331	Abstract Algebra I	3.0-4.0
or MATH 401	Elements of Modern Analysis I	
Math Major Electives [**]		**30.0**

Select a minimum of 30 credits from the following:

MATH 205	Survey of Geometry
MATH 221	Discrete Mathematics
MATH 222 [WI]	Combinatorics
MATH 235	Math Competition Problem Solving Seminar
MATH 238	History of Mathematics
MATH 250	Mathematics of Investment and Credit
MATH 285	Differential Equations II
MATH 300	Numerical Analysis I
MATH 301	Numerical Analysis II
MATH 305	Introduction to Optimization Theory
MATH 311	Probability and Statistics I
MATH 312	Probability and Statistics II
MATH 316	Mathematical Applications of Symbolic Software
MATH 318 [WI]	Mathematical Applications of Statistical Software
MATH 319	Techniques of Data Analysis
MATH 320	Actuarial Mathematics
MATH 321	Vector Calculus
MATH 322	Complex Variables
MATH 323	Partial Differential Equations
MATH 332	Abstract Algebra II
MATH 387	Linear Algebra II
MATH 401	Elements of Modern Analysis I
or MATH 331	Abstract Algebra I
MATH 402	Elements of Modern Analysis II
MATH 422	Introduction to Topology
MATH 449	Mathematical Finance
MATH 450	Introduction to Graph Theory
MATH 475	Cryptography
MATH 483	Discrete Event Simulation
MATH 489	Tensor Calculus
Total Credits	181.0-182.0

*   Math majors must pass MATH 121 with a grade of B or higher.

**   If a student takes both of MATH 331 and MATH 401, then one of these can count as a Mathematics Elective. Up to 3 mathematics-related courses from other departments may be substituted for Mathematics Electives with departmental permission. MATH special topics courses may be substituted for Mathematics Electives with departmental permission.

Categories of Electives

- *Humanities and arts electives*
  Designated courses in art, art history, communication studies, foreign languages (300-level or above), history, literature, music, philosophy, religion, and theatre arts.

- *International electives*
  Designated courses in anthropology, art history, history, literature, music, politics and sociology. Courses with an international focus may be used to fulfill requirements in other categories as well.

- *Science electives*
  Students select two courses from chemistry, biology or physics. Both courses may be in the same subject or they may be in different subject areas.

- *Social and behavioral sciences electives*

Designated courses in anthropology, economics, criminology & justice studies, international relations, history, politics, psychology and sociology.

- *Studies in diversity electives*
  Designated courses in Africana studies, anthropology, communication, English, history, Judaic studies, linguistics, music, sociology and women's & gender studies.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Degree Requirements (BS)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COM 230	Techniques of Speaking	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV S101	The Drexel Experience	1.0
UNIV S201	Looking Forward: Academics and Careers	1.0
Computer Science sequence:		**9.0**
CS 150	Computer Science Principles	
or CS 164	Introduction to Computer Science	
CS 171	Computer Programming I	
CS 172	Computer Programming II	
Any Biology (BIO) course		3.0-4.0
Any Chemistry (CHEM) course		3.0-4.0
Any Physics (PHYS) course		3.0-4.0
Humanities electives		6.0
Social sciences electives		15.0
International studies or studies in diversity electives		6.0

Free electives		41.0
Mathematics Requirements		
MATH 121	Calculus I [*]	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
MATH 200	Multivariate Calculus	4.0
MATH 201	Linear Algebra	4.0
MATH 210	Differential Equations	4.0
MATH 220 [WI]	Introduction to Mathematical Reasoning	3.0
MATH 331	Abstract Algebra I	4.0
MATH 332	Abstract Algebra II	3.0
MATH 401	Elements of Modern Analysis I	3.0
MATH 402	Elements of Modern Analysis II	3.0
Math Major Electives [**]		**40.0**
Select a minimum of 40 credits from the following:		
MATH 222 [WI]	Combinatorics	
MATH 235	Math Competition Problem Solving Seminar	
MATH 250	Mathematics of Investment and Credit	
MATH 285	Differential Equations II	
MATH 300	Numerical Analysis I	
MATH 301	Numerical Analysis II	
MATH 305	Introduction to Optimization Theory	
MATH 311	Probability and Statistics I	
MATH 312	Probability and Statistics II	
MATH 316	Mathematical Applications of Symbolic Software	
MATH 318 [WI]	Mathematical Applications of Statistical Software	
MATH 319	Techniques of Data Analysis	
MATH 320	Actuarial Mathematics	
MATH 321	Vector Calculus	
MATH 322	Complex Variables	
MATH 323	Partial Differential Equations	
MATH 387	Linear Algebra II	
MATH 422	Introduction to Topology	
MATH 449	Mathematical Finance	
MATH 450	Introduction to Graph Theory	
MATH 475	Cryptography	
MATH 483	Discrete Event Simulation	
MATH 489	Tensor Calculus	
Total Credits		181.0-184.0

[*]   Math majors must pass MATH 121 with a grade of B or higher.

[**]   MATH special topics courses may be substituted for Math Major Electives with departmental permission.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study (BA)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

5-year co-op sequence

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121[*]	Calculus I	4.0
UNIV S101	The Drexel Experience	1.0
CS 150 or 164	Computer Science Principles Introduction to Computer Science	3.0
Science elective		3.0-4.0
	Term Credits	14.0-15.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
CS 171	Computer Programming I	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122	Calculus II	4.0
Science elective		3.0-4.0
	Term Credits	14.0-15.0
Term 3		
CS 172	Computer Programming II	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 123	Calculus III	4.0
MATH 220 [WI]	Introduction to Mathematical Reasoning	3.0
Social and behavioral science elective		3.0
	Term Credits	16.0
Term 4		
COM 230	Techniques of Speaking	3.0
MATH 200	Multivariate Calculus	4.0
MATH 201	Linear Algebra	4.0
Diversity studies elective		3.0
International studies elective		3.0
	Term Credits	17.0
Term 5		
Mathematics (MATH) courses[**]		6.0
Humanities/Fine arts elective		3.0
Free electives		6.0
	Term Credits	15.0
Term 6		
MATH 210	Differential Equations	4.0
Mathematics (MATH) course[**]		3.0
Social and behavioral science elective		3.0
Humanities/Fine arts elective		3.0
Free elective		3.0
	Term Credits	16.0
Term 7		
Mathematics (MATH) course[**]		3.0

		Credits
Diversity studies elective		3.0
Free electives		9.0
	Term Credits	15.0
Term 8		
MATH 401 or 331	Elements of Modern Analysis I Abstract Algebra I	3.0-4.0
Mathematics (MATH) course**		3.0
International studies elective		3.0
Free electives		6.0
	Term Credits	15.0-16.0
Term 9		
UNIV S201	Looking Forward: Academics and Careers	1.0
Mathematics (MATH) courses**		4.0
Free electives		10.0
	Term Credits	15.0
Term 10		
Mathematics (MATH) course**		4.0
Free electives		12.0
	Term Credits	16.0
Term 11		
Mathematics (MATH) course**		3.0
Free electives		11.0
	Term Credits	14.0
Term 12		
Mathematics (MATH) course**		4.0
Free electives		10.0
	Term Credits	14.0

Total Credit: 181.0-184.0

*   See degree requirements (p. 97).

**   Select from MATH 205, MATH 221, MATH 222 [WI] , MATH 235, MATH 238, MATH 250, MATH 285, MATH 300, MATH 301, MATH 305, MATH 311, MATH 312, MATH 316, MATH 318 [WI] , MATH 319, MATH 320, MATH 321, MATH 322, MATH 323, MATH 332, MATH 387, MATH 402, MATH 422, MATH 449, MATH 450, MATH 475, MATH 483, MATH 489. If a student takes both of MATH 331 and MATH 401, then one of these can count as a Mathematics Elective. Up to 3 mathematics-related courses from other departments may be substituted for Mathematics Electives with departmental permission. MATH special topics courses may be substituted for Mathematics Electives with departmental permission.

Sample Plan of Study (BS)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		**Credits**
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121	Calculus I	4.0
UNIV S101	The Drexel Experience	1.0
CS 150 or 164	Computer Science Principles Introduction to Computer Science	3.0
Any Biology (BIO) course		3.0
	Term Credits	14.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
CS 171	Computer Programming I	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122	Calculus II	4.0
Any Chemistry (CHEM) course		3.0
	Term Credits	14.0
Term 3		
CS 172	Computer Programming II	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 123	Calculus III	4.0
MATH 200	Multivariate Calculus	4.0
Any Physics (PHYS) course		3.0-4.0
	Term Credits	17.0-18.0
Term 4		
COM 230	Techniques of Speaking	3.0
MATH 201	Linear Algebra	4.0
MATH 220 [WI]	Introduction to Mathematical Reasoning	3.0
Social Science electives		6.0
	Term Credits	16.0
Term 5		
MATH 210	Differential Equations	4.0
Social Science elective		3.0
Mathematics (MATH) elective**		3.0
International Studies or Studies in Diversity elective		3.0
	Term Credits	13.0
Term 6		
MATH 331	Abstract Algebra I	4.0
Humanities elective		3.0
Mathematics (MATH) elective**		4.0
Social Science elective		3.0
	Term Credits	14.0
Term 7		
MATH 332	Abstract Algebra II	3.0
Humanities elective		3.0
International Studies or Studies in Diversity elective		3.0
Mathematics (MATH) elective**		4.0
Free elective		3.0
	Term Credits	16.0
Term 8		
MATH 401	Elements of Modern Analysis I	3.0
Social Science elective		3.0
Mathematics (MATH) elective**		3.0
Free electives		6.0
	Term Credits	15.0
Term 9		
MATH 402	Elements of Modern Analysis II	3.0
UNIV S201	Looking Forward: Academics and Careers	1.0
Mathematics (MATH) electives**		7.0
Free electives		6.0
	Term Credits	17.0
Term 10		
Mathematics (MATH) electives**		8.0
Free electives		7.0-8.0
	Term Credits	15.0-16.0
Term 11		
Mathematics (MATH) electives**		7.0
Free electives		8.0
	Term Credits	15.0
Term 12		
Mathematics (MATH) electives**		6.0

Free electives	9.0-10.0
Term Credits	15.0-16.0

Total Credit: 181.0-184.0

* See degree requirements (p. 97).

** Select from MATH 222 [WI] , MATH 235, MATH 250, MATH 285, MATH 300, MATH 301, MATH 305, MATH 311, MATH 312, MATH 316, MATH 318 [WI] , MATH 319, MATH 320, MATH 321, MATH 322, MATH 323, MATH 387, MATH 422, MATH 449, MATH 450, MATH 475, MATH 483, MATH 489. MATH special topics courses may be substituted for Mathematics Electives with departmental permission.

Co-op/Career Opportunities

Mathematicians are employed in a variety of capacities in business, industry, and government. Students can combine courses in economics or finance and mathematics to prepare for careers in the actuarial field, banks, stock exchanges, or finance departments of large corporations or other financial institutions. Students interested in science careers may focus on probability and statistics in order to work for industries like pharmaceutical manufacturers. Many others combine math studies with computer science courses to prepare for careers in information systems or engineering.

Teacher certification is also a career option available through a joint program in mathematics and teacher education.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) for more detailed information on co-op and post-graduate opportunities.

Dual Degree Bachelor's Programs

Since applied mathematics plays an important role in many different disciplines, mathematics majors often choose to pursue specialization in a second field of study. Students may choose a dual major that involves completing the requirements of two separate majors or they can opt for a minor, which involves completing the major in one field and a smaller set of courses in another.

Dual majors are common in mathematics/computer science and mathematics/physics. Students interested in a dual major should consult with their advisor or contact the assistant department head. Dual majors in other fields are also possible, but early planning and discussions with advisors is essential.

Mathematics Faculty

David M. Ambrose, PhD *(Duke University) Associate Department Head, Mathematics.* Professor. Applied analysis and computing for systems of nonlinear partial differential equations, especially free-surface problems in fluid dynamics.

Jason Aran, MS *(Drexel University).* Associate Teaching Professor.

Jonah D. Blasiak, PhD *(University of California at Berkeley).* Associate Professor. Algebraic combinatorics, representation theory, and complexity theory.

Yasmine Boolakee-Pant, MS *(University of Freiburg).* Instructor.

Robert P. Boyer, PhD *(University of Pennsylvania).* Professor. Functional analysis, C*-algebras and the theory of group.

Fernando Carreon, PhD *(University of Texas at Austin).* Teaching Professor.

Patrick Clarke, PhD *(University of Miami).* Associate Professor. Homological mirror symmetry, Landau-Ginzburg models, algebraic geometry, symplectic geometry.

Daryl Falco, MS *(Drexel University).* Associate Teaching Professor. Discrete mathematics and automata theory.

Raymond Favocci, MS *(Drexel University).* Associate Teaching Professor.

Darij Grinberg, PhD *(Massachusetts Institute of Technology).* Assistant Professor. Algebraic Combinatorics, Noncommutative Algebra, Symmetric Functions, Hopf Algebras, Enumerative Combinatorics, Invariant Theory

Pavel Grinfeld, PhD *(Massachusetts Institute of Technology).* Associate Professor. Intersection of physics, engineering, applied mathematics and computational science.

Anatolii Grinshpan, PhD *(University of California at Berkeley).* Associate Teaching Professor. Function theory and operator theory, harmonic analysis, matrix theory.

Yixin Guo, PhD *(University of Pittsburgh).* Associate Professor. Biomathematics, dynamical systems, ordinary and partial differential equations and math education.

R. Andrew Hicks, PhD *(University of Pennsylvania).* Professor. Geometry; optics; computer vision.

Pawel Hitczenko, PhD *(Warsaw University).* Professor. Probability theory and its applications to analysis, combinatorics, wavelets, and the analysis of algorithms.

Jeffrey LaComb, PhD *(Duke University).* Assistant Teaching Professor. Rare Event Simulation, Dynamical Systems, Numerical Analysis and Mathematical Biology

Georgi S. Medvedev, PhD *(Boston University).* Professor. Ordinary and partial differential equations, mathematical neuroscience.

Cecilia Mondaini, PhD *(Federal University of Rio de Janeiro).* Assistant Professor. Analysis of Partial Differential Equations, Fluid Dynamics, Stochastic Processes

Shari Moskow, PhD *(Rutgers University) Department Head.* Professor. Partial differential equations and numerical analysis, including homogenization theory, numerical methods for problems with rough coefficients, and inverse problems.

Oksana P. Odintsova, PhD *(Omsk State University).* Teaching Professor. Math education; geometrical modeling.

Dimitrios Papadopoulos, MS *(Drexel University).* Assistant Teaching Professor.

Joel Pereira, PhD *(University of North Carolina).* Assistant Teaching Professor. Commutative Algebra

Ronald K. Perline, PhD *(University of California at Berkeley) Undergraduate Adviser.* Associate Professor. Applied mathematics, numerical analysis, symbolic computation, differential geometry, mathematical physics.

Marci A. Perlstadt, PhD *(University of California at Berkeley).* Associate Professor. Applied mathematics, computed tomography, numerical analysis of function reconstruction, signal processing, combinatorics.

Adam C. Rickert, MS *(Drexel University).* Associate Teaching Professor.

Eric Schmutz, PhD *(University of Pennsylvania).* Professor. Probabilistic combinatorics, asymptotic enumeration.

Li Sheng, PhD *(Rutgers University).* Associate Professor. Discrete optimization, combinatorics, operations research, graph theory and its application in molecular biology, social sciences and communication networks, biostatistics.

Gideon Simpson, PhD *(Columbia University).* Associate Professor. Partial differential equations, scientific computing and applied mathematics.

Xiaoming Song, PhD *(University of Kansas).* Associate Professor. Stochastic Calculus, Large Deviation Theory, Theoretical Statistics, Data Network Modeling and Numerical Analysis.

Jeanne M. Steuber, MS *(Boston University).* Associate Teaching Professor.

Kenneth P. Swartz, PhD *(Harvard University).* Assistant Teaching Professor. Applied statistics, data analysis, calculus, discrete mathematics, biostatistics.

K. Shwetketu Virbhadra, PhD *(Physical Research Laboratory).* Instructor.

Richard D. White, MS *(Penn State University).* Assistant Teaching Professor.

Hugo J. Woerdeman, PhD *(Vrije Universiteit, Amsterdam).* Professor. Matrix and operator theory, systems theory, signal and image processing, and harmonic analysis.

J. Douglas Wright, PhD *(Boston University) Associate Department Head.* Professor. Partial differential equations, specifically nonlinear waves and their interactions.

Dennis G. Yang, PhD *(Cornell University).* Associate Teaching Professor. Dynamical systems, neurodynamics.

Thomas (Pok-Yin) Yu, PhD *(Stanford University).* Professor. Multiscale mathematics, wavelets, applied harmonic analysis, subdivision algorithms, nonlinear analysis, applied differential geometry and data analysis.

Matthew Ziemke, PhD *(University of South Carolina).* Assistant Teaching Professor. Functional Analysis, Operator Algebras, Semigroups, Mathematical Physics

Emeritus Faculty

Howard Anton, PhD *(Polytechnic Institute of Brooklyn).* Professor Emeritus.

Loren N. Argabright, PhD *(University of Washington).* Professor Emeritus. Functional analysis, wavelets, abstract harmonic analysis, the theory of group representations.

Robert C. Busby, PhD *(University of Pennsylvania).* Professor Emeritus. Functional analysis, C*-algebras and group representations, computer science.

Ewaugh Finney Fields, EdD *(Temple University) Dean Emeritus.* Professor Emeritus. Mathematics education, curriculum and instruction, minority engineering education.

William M.Y. Goh, PhD *(Ohio State University).* Associate Professor Emeritus. Number theory, approximation theory and special functions, combinatorics, asymptotic analysis.

Patricia Henry Russell, MS *(Drexel University).* Teaching Professor Emerita.

Bernard Kolman, PhD *(University of Pennsylvania).* Professor Emeritus. Lie algebras; theory, applications, and computational techniques; operations research.

Charles J. Mode, PhD *(University of California at Davis).* Professor Emeritus. Probability and statistics, biostatistics, epidemiology, mathematical demography, data analysis, computer-intensive methods.

Chris Rorres, PhD *(Courant Institute, New York University).* Professor Emeritus. Applied mathematics, scattering theory, mathematical modeling in biological sciences, solar-collection systems.

Justin R. Smith, PhD *(Courant Institute, New York University).* Professor Emeritus. Homotopy theory, operad theory, quantum mechanics, quantum computing.

Jet Wimp, PhD *(University of Edinburgh).* Professor Emeritus. Applied mathematics, special factors, approximation theory, numerical techniques, asymptotic analysis.

Philosophy

Major: Philosophy
Degree Awarded: Bachelor of Arts (BA)
Calendar Type: Quarter
Total Credit Hours: 182.0
Co-op Options: One Co-op (Four years); No Co-op (Four years); Three Co-op (Five years)
Classification of Instructional Programs (CIP) code: 38.0101
Standard Occupational Classification (SOC) code: 25-1126

About the Program

A great philosopher once said, "Philosophers have just interpreted the world--but the point is to change it." At Drexel, we believe ideas do affect and change the world--in how we choose what to do, in how we approach our activities, and in what we learn from them. We think the most important reason to engage in philosophy is that we *can* change the world.

The Drexel philosophy program is organized around the idea that the study of philosophy should help students confront life's complexity. Philosophy classes at Drexel involve students in the active development of their reflective, creative, rational, logical, and linguistic abilities by engaging them with the problems of life and the world. The Drexel philosophy major is an excellent preparation for success in any field of endeavor that values thoughtful reflection, logical thinking, and clear communication about real issues and concerns. It is particularly valuable as a preparation for careers in education and law, or in graduate study in philosophy, or in fields related to philosophy like critical media studies, public policy, or science, technology, and society (STS).

Drexel philosophy majors take a mixture of historical and topical courses in the major fields of philosophical inquiry. These include ethics, metaphysics (philosophy of reality), epistemology (philosophy of knowledge), aesthetics (philosophy of art), social and political philosophy, philosophy of science, and logic. Our philosophy elective classes cover a wide range of subjects including technology, medicine, law, religion, science, the environment, and more. Our upper-level seminar classes are discussion-driven, reading- and writing-intensive classes usually limited to 10-12 students.

Prior to the end of sophomore year students may choose to focus their philosophical studies in one of three areas of concentration. These are:

- Ethical Theory and Practice
- Philosophy and Law
- Philosophy, Technology, and Science

Students may also remain in the general Philosophy concentration, which gives them the widest range of options from which to select their courses.

Prior to the end of junior year, students may opt to work on a nine-credit Senior Thesis. This is a year-long, faculty-mentored independent research and writing project, culminating in a defense before the program's faculty and students. This project consists of three one-on-one tutorials with a faculty member of the student's choosing.

The philosophy BA includes approximately 50.0 credits of free electives, which makes it possible for many students to double major. The Drexel philosophy program also offers a minor in philosophy (24.0 credits) and certificate programs in Ethical Theory and Practice, Philosophy, Arts and Humanities, and Philosophy, Science, and Technology (18.0 credits each).

Additional Information

For more information about Drexel philosophy classes and programs, please visit the Department of English & Philosophy website or drop by to see our director anytime. The Department of English & Philosophy is located in MacAlister Hall, room 5044. The director can be contacted at:

Dr. Peter Amato
Director of Programs in Philosophy
Department of English and Philosophy
MacAlister 5030
215-895-1353
peterama@drexel.edu

Degree Requirements

As an alternative to PHIL 421 [WI] , PHIL 431 [WI] , and PHIL 461 [WI] , students may select PHIL T480 *Special Topics*, PHIL 481 [WI] *Philosophical School or Movement*, or PHIL 485 [WI] *Major Philosopher* class with program approval.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

College of Arts and Sciences Requirements

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 105	Critical Reasoning	3.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Two Studies in Diversity Electives		6.0
Two International Studies Electives		6.0
Two Math Electives		6.0
Two Natural Science Electives		6.0
Four Social and Behavioral Sciences Electives		12.0
Select two of the following:		6.0
ARTH 101	History of Art I: Ancient to Medieval	
ARTH 102	History of Art II: Renaissance to Romanticism	
ARTH 103	History of Art III: Modern Art	
Language Requirement		**8.0**
Major Requirements - All Concentrations		
COM 230	Techniques of Speaking	3.0
PHIL 101	Introduction to Western Philosophy	3.0
PHIL 211	Metaphysics: Philosophy of Reality	3.0
PHIL 212	Ancient Philosophy	3.0
PHIL 214	Modern Philosophy	3.0
PHIL 215	Contemporary Philosophy	3.0
PHIL 221	Epistemology: Philosophy of Knowledge	3.0
PHIL 251	Ethics	3.0
PHIL 421 [WI]	Seminar in Ancient Philosophy	3.0
PHIL 431 [WI]	Seminar in Modern Philosophy	3.0
PHIL 461 [WI]	Seminar in Contemporary Philosophy	3.0
Professional Ethics Elective		
Select one of the following:		3.0
PHIL 301	Business Ethics	
PHIL 305	Ethics and the Media	
PHIL 311	Ethics and Information Technology	
PHIL 315	Engineering Ethics	
PHIL 317	Ethics and Design Professions	
PHIL 321	Biomedical Ethics	
PHIL 322	Ethics of Human Enhancement	
PHIL 323	Organizational Ethics	
PHIL 325	Ethics in Sports Management	
PHIL 330	Criminal Justice Ethics	
PHIL 335	Global Ethical Issues	
PHIL 340	Environmental Ethics	
Thesis or Non-Thesis Option		**9.0**
Thesis Option:		
PHIL 497 [WI]	Senior Essay I: Research & Thesis Development	
PHIL 498 [WI]	Senior Essay II: Argument Construction	
PHIL 499 [WI]	Senior Essay III: Defense	
Non-Thesis Option:		
PHIL 481 [WI]	Seminar in a Philosophical School	
PHIL 485 [WI]	Seminar in a Major Philosopher	
Select one of the following:		
PHIL 341	Environmental Philosophy	
PHIL 351	Philosophy of Technology	
PHIL 355	Philosophy of Medicine	
PHIL 361	Philosophy of Science	
PHIL 381 [WI]	Philosophy in Literature	
PHIL 385	Philosophy of Law	
PHIL 391	Philosophy of Religion	
Electives		
Free Electives		51.0
Concentration Option		**21.0**
General Philosophy Concentration:		

PHIL 111	Symbolic Logic I
PHIL 231	Aesthetics: Philosophy of Art
or PHIL 218	Philosophy of Mathematics
PHIL 481 [WI]	Seminar in a Philosophical School
PHIL 485 [WI]	Seminar in a Major Philosopher
Select one of the following courses:	
PHIL 207	Symbolic Logic II
PHIL 301	Business Ethics
PHIL 305	Ethics and the Media
PHIL 311	Ethics and Information Technology
PHIL 315	Engineering Ethics
PHIL 317	Ethics and Design Professions
PHIL 321	Biomedical Ethics
PHIL 322	Ethics of Human Enhancement
PHIL 323	Organizational Ethics
PHIL 325	Ethics in Sports Management
PHIL 330	Criminal Justice Ethics
PHIL 335	Global Ethical Issues
PHIL 340	Environmental Ethics
Select two of the following courses:	
PHIL 341	Environmental Philosophy
PHIL 351	Philosophy of Technology
PHIL 355	Philosophy of Medicine
PHIL 361	Philosophy of Science
PHIL 381 [WI]	Philosophy in Literature
PHIL 385	Philosophy of Law
PHIL 391	Philosophy of Religion
Philosophy & Law Concentration:	
PHIL 111	Symbolic Logic I
PHIL 207	Symbolic Logic II
PHIL 241	Social & Political Philosophy
PHIL 385	Philosophy of Law
PHIL 391	Philosophy of Religion
PHIL 481 [WI]	Seminar in a Philosophical School
or PHIL 485	Seminar in a Major Philosopher
Select one of the following courses:	
PHIL 301	Business Ethics
PHIL 305	Ethics and the Media
PHIL 311	Ethics and Information Technology
PHIL 315	Engineering Ethics
PHIL 317	Ethics and Design Professions
PHIL 321	Biomedical Ethics
PHIL 322	Ethics of Human Enhancement
PHIL 323	Organizational Ethics
PHIL 325	Ethics in Sports Management
PHIL 330	Criminal Justice Ethics
PHIL 335	Global Ethical Issues
PHIL 340	Environmental Ethics
Ethical Theory & Practice Concentration:	
PHIL 102	Introduction to Eastern Philosophy
PHIL 231	Aesthetics: Philosophy of Art
or PHIL 241	Social & Political Philosophy
PHIL 385	Philosophy of Law
PHIL 391	Philosophy of Religion
PHIL 481 [WI]	Seminar in a Philosophical School
PHIL 485 [WI]	Seminar in a Major Philosopher
Select one of the following courses:	
PHIL 301	Business Ethics
PHIL 305	Ethics and the Media
PHIL 311	Ethics and Information Technology
PHIL 315	Engineering Ethics
PHIL 317	Ethics and Design Professions

PHIL 321	Biomedical Ethics
PHIL 322	Ethics of Human Enhancement
PHIL 323	Organizational Ethics
PHIL 325	Ethics in Sports Management
PHIL 330	Criminal Justice Ethics
PHIL 335	Global Ethical Issues
PHIL 340	Environmental Ethics
Philosophy, Technology & Science Concentration:	
PHIL 111	Symbolic Logic I
PHIL 207	Symbolic Logic II
PHIL 218	Philosophy of Mathematics
or PHIL 231	Aesthetics: Philosophy of Art
PHIL 351	Philosophy of Technology
PHIL 361	Philosophy of Science
PHIL 481 [WI]	Seminar in a Philosophical School
PHIL 485 [WI]	Seminar in a Major Philosopher

Total Credits	182.0

*   Students are required to take a minimum of two consecutive courses in a foreign language and must complete at least through the 103 level. Reaching at least the 201 level is recommended for students considering graduate school in Philosophy.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
PHIL 101	Introduction to Western Philosophy	3.0
PHIL 105	Critical Reasoning	3.0
UNIV H101	The Drexel Experience	1.0
Language elective*		4.0
Math elective		3.0
	Term Credits	17.0

Term 2

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
PHIL 111 or 102	Symbolic Logic I Introduction to Eastern Philosophy	3.0
Math elective		3.0
Language elective		4.0
Social Science elective		3.0
	Term Credits	17.0

Term 3

ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PHIL 251	Ethics	3.0
Diversity elective		3.0
Natural Science elective		3.0
Social Science elective		3.0
	Term Credits	15.0

Term 4

ARTH 101 or 102	History of Art I: Ancient to Medieval History of Art II: Renaissance to Romanticism	3.0
PHIL 211	Metaphysics: Philosophy of Reality	3.0
PHIL 212	Ancient Philosophy	3.0
Diversity elective		3.0
Natural Science elective		3.0
	Term Credits	15.0

Term 5

ARTH 102 or 103	History of Art II: Renaissance to Romanticism History of Art III: Modern Art	3.0
PHIL 214	Modern Philosophy	3.0
PHIL 221	Epistemology: Philosophy of Knowledge	3.0
PHIL 481 [WI]	Seminar in a Philosophical School	3.0
Social Science elective		3.0
	Term Credits	15.0

Term 6

COM 230	Techniques of Speaking	3.0
PHIL 207	Symbolic Logic II (or any Professional Ethics elective PHIL 301 - PHIL 340)	3.0
PHIL 215	Contemporary Philosophy	3.0
PHIL 485 [WI]	Seminar in a Major Philosopher	3.0
Free elective		3.0
Social Science elective		3.0
	Term Credits	18.0

Term 7

PHIL 231 or 218	Aesthetics: Philosophy of Art Philosophy of Mathematics	3.0
PHIL 421 [WI]	Seminar in Ancient Philosophy	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Free electives		6.0
	Term Credits	13.0

Term 8

PHIL 431 [WI]	Seminar in Modern Philosophy	3.0
International Studies elective		3.0
Free electives		9.0
	Term Credits	15.0

Term 9

International Studies elective		3.0
Professional Ethics elective		3.0
Free electives		9.0
	Term Credits	15.0

Term 10

PHIL 497 [WI]	Senior Essay I: Research & Thesis Development (or Philosophy elective PHIL 341 - PHIL 395)	3.0
Philosophy elective PHIL 341 - PHIL 391		3.0
Free electives		6.0
	Term Credits	12.0

Term 11

PHIL 498 [WI] or 485 [WI]	Senior Essay II: Argument Construction Seminar in a Major Philosopher	3.0
Free electives		9.0
Philosophy Elective PHIL 341 - PHIL 391		3.0
	Term Credits	15.0

Term 12

PHIL 461 [WI] **	Seminar in Contemporary Philosophy	3.0
PHIL 499 [WI] or 481 [WI]	Senior Essay III: Defense Seminar in a Philosophical School	3.0
Free electives		9.0
	Term Credits	15.0

Total Credit: 182.0

*   Students must complete two consecutive courses in a foreign language and must reach the 103 level.

**   An appropriate 400-level PHIL seminar may be substituted for this requirement with program approval.

Co-op/Career Opportunities

Opportunities

No major prepares students for success in as wide a variety of careers as philosophy. Because philosophical work helps students develop superior reasoning, communication, and analytical skills, a philosophy major can be an ideal choice for pre-med or pre-law students. It is also particularly valuable as a preparation for graduate study in philosophy, and fields related to it, such as critical media studies, public policy, education, and science, technology, and society (STS). The Drexel philosophy major is an excellent preparation for success in any field of endeavor that values thoughtful reflection, logical thinking, and clear communication. Philosophy majors graduate into a wide range of successful careers in business, industry, law, government, education, and service organizations and agencies as well as many fields of graduate study and research.

In just its first five years, the Drexel philosophy BA program graduated students into careers including teaching, the law, public policy, and academic research.

Co-op Experiences

Philosophy students at Drexel are encouraged to seek out interesting co-op opportunities related to the skills and interests they are developing through their philosophical studies and potential career options they would like to explore. These can be as broad as the difference between an ethics-related co-op that has the student shadowing an ethicist working for a hospital's board of institutional review, to a student who is interested in aesthetics and politics working with the Philadelphia Mural Arts Program in liaison with community groups. Students in philosophy who are pre-law frequently pursue law-related co-ops and co-ops at public and private agencies and organizations that employ lawyers and law students. Students in philosophy who are thinking about careers in academia have the full gamut of writing, editing, and publishing co-ops available to them, as well as research related co-ops they can develop by working with professors. While academically-oriented co-ops and co-ops in the Humanities generally pay less than those in the sciences, business, law,

and engineering—if they pay at all—they are still enormously valuable as a way for students to develop a sense of what various careers might actually be like and how they work.

For detailed information on co-op and career opportunities, visit the Drexel Steinbright Career Development Center web page. For further information about co-op and career prospects related to philosophy, contact the Drexel philosophy program director:

Dr. Peter Amato
Director of Programs in Philosophy
Department of English and Philosophy
MacAlister 5030
215-895-1353
peterama@drexel.edu

Philosophy Faculty

Stacey Ake, PhD *(Pennsylvania State University)*. Teaching Professor. Ethics, semiotics, existentialism

Peter Amato, PhD *(Fordham University) Director, Philosophy*. Teaching Professor. Ethics, Marxism, Continental philosophy.

Jacques N. Catudal, PhD *(Temple University)*. Associate Professor. Ancient philosophy, epistemology, aesthetics.

Nathan Hanna, PhD *(Syracuse University)*. Associate Professor. Ethics, philosophy of law, philosophy of punishment

Adam Knowles, PhD *(The New School for Social Research)*. Associate Teaching Professor. Continental philosophy, phenomenology, Heidegger

Carol Mele, PhD *(University of Pennsylvania)*. Associate Teaching Professor. Ethical Theory, social and political philosophy, Rawls.

Flavia Padovani, PhD *(University of Geneva)*. Associate Professor. History and philosophy of science, epistemology, logic.

Marilyn Piety, PhD *(McGill University)*. Professor. History of philosophy, philosophy of religion, Kierkegaard.

Andrew Smith, PhD *(SUNY, Stony Brook)*. Associate Professor. Philosophy, social and political philosophy, American philosophy.

Philosophy, Politics and Economics

Major: Philosophy, Politics and Economics
Degree Awarded: Bachelor of Arts (BA)
Calendar Type: Quarter
Total Credit Hours: 189.0
Co-op Options: One Co-op (Four years); No Co-op (Four years); Three Co-op (Five years)
Classification of Instructional Programs (CIP) code: 45.1004
Standard Occupational Classification (SOC) code: 25-1065

About the Program

Drexel University's BA degree Philosophy, Politics & Economics, or PPE as it is often called, exemplifies Drexel's commitment to comprehensive education at the intersection of thought and practice. A joint endeavor of the School of Economics, the Department of Politics and the Department of English and Philosophy, the BA in PPE provides a multidisciplinary foundation for professionals and researchers who want to address the

complex, interconnected challenges of contemporary life. It prepares students for a wide variety of excellent careers that require thoughtful analysis and engaged leadership including but not limited to public service, government, international and domestic business, law, community organizing, publishing, journalism, education, academic research and more.

PPE began in the early Twentieth Century at Oxford University in the United Kingdom in an effort to ensure that scholars were ready to apply their learning in practical, governmental and business contexts to become leaders and change agents. Historically, political science and economics descend from what had been called "political economy." PPE acknowledges what is often lost in the separation and specialization of these fields—the political wisdom that understands economic imperatives and the economic intelligence that recognizes the limits of political initiative. The philosophical dimension of PPE represents the vital reflective and critical aspects that are essential to bringing political and economic insights into conversation for understanding and leadership. PPE is devoted to the idea that great learning should inspire and empower students to have an impact on the world.

Students in the Drexel BA in PPE begin with the interdisciplinary class PPE 101 *Introduction to Philosophy, Politics and Economics*, which presents the field through a discussion of how the aims and methods of the three constitutive disciplines work together and discussion of the political, economic and philosophical dimensions of specific topics and themes. The Philosophy classes in the major are mainly focused on issues in ethics, logic, philosophy of law, and social and political philosophy. The Politics classes cover a variety of subjects and constitute a solid foundation in Political Science covering topics that include Comparative Politics, History of Political Thought, Qualitative or Quantitative Research Methods, Theories of Justice, American Foreign Policy, Social Protest Movements in Comparative Perspective and more. The Economics classes are designed to give the student a foundation for profound analysis and insight. These include Microeconomics, Macroeconomics, Economic Ideas, Public Finance, and electives chosen from courses which include Game Theory and Applications, Economics of Small Business, Labor Economics, Comparative Economic Systems, Resource and Environmental Economics, and more.

PPE majors also take electives in Sociology, choosing from courses like Race, Ethnicity and Social Inequality, Wealth and Power, Gender and Society, Development and Underdevelopment in the Global South, Environmental Justice and more. In the interactive seminar capstone course, PPE 450, students work with an instructor as they formulate, evaluate and criticize public policy proposals, research and/or theoretical perspectives on political and economic issues using the research tools, arguments and methods drawn from the three fields. PPE majors at Drexel have access to the widest range of co-op positions related to public service, government, international and domestic business, law, community organizing, education, publishing, journalism, academic research and many more areas.

Admission Requirements

The interdisciplinary Philosophy, Politics and Economics (PPE) program exemplifies Drexel's commitment to comprehensive education at the intersection of thought and practice. A joint endeavor of the School of Economics, the Department of Politics, and the Department of English and Philosophy, the BA in PPE provides a multidisciplinary foundation for professionals who will address the complex, interconnected challenges of contemporary life. It prepares students for careers that require careful analysis, clear foresight, and thoughtful leadership: government,

politics, law, public policy, public service, and business. Our program starts from the idea that the economy is fundamentally political, politics are fundamentally economic, and both are shaped by centuries of philosophical inquiry. We build on a foundation of rigorous philosophical thought, political and economic theory, and applied research skills.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

College of Arts and Sciences Requirements:

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 105	Critical Reasoning	3.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Two Studies in Diversity classes		6.0
Two International Studies classes		6.0
Two Natural Science classes		6.0
A Mathematics sequence of at least two classes in either Analysis or Calculus [*]		8.0
Two Social and Behavioral Science classes		6.0
Two Arts & Humanities classes [**]		6.0
Two classes in one Foreign Language completing level 103 [***]		8.0
Free Electives		25.0

Major Requirements:

PPE 101	Introduction to Philosophy, Politics and Economics	3.0
PHIL 101	Introduction to Western Philosophy	3.0
PSCI 110	American Government	4.0
or PSCI 140	Comparative Politics I	
or PSCI 150	International Politics	
PHIL 111	Symbolic Logic I	3.0
PSCI 120	History of Political Thought	4.0
One of these Political Science Methods classes:		4.0
PSCI 231	Qualitative and Mixed-Methods Research in Political Science	
PSCI 232	Quantitative Research Methods in Political Science	
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
ECON 326 [WI]	Economic Ideas	4.0
PHIL 207	Symbolic Logic II	3.0
PHIL 241	Social & Political Philosophy	3.0
PHIL 251	Ethics	3.0
Two of these Political Science Area classes:		8.0
PSCI 210	American Political Development	
PSCI 229	Theories of Justice	
PSCI 250	American Foreign Policy	
PSCI 252	Global Governance	
PSCI 260 [WI]	Power in Protest: Social Movements in Comparative Perspective	
Two of these Sociology Elective classes:		8.0
SOC 210	Race, Ethnicity and Social Inequality	
SOC 220	Wealth and Power	
SOC 230	Gender and Society	
SOC 330	Development and Underdevelopment in the Global South	
SOC 346	Environmental Justice	

ECON 334	Public Finance	4.0
SOC 355 [WI]	Classical Social Theory	4.0
SOC 356 [WI]	Contemporary Social Theory	4.0
PHIL 385	Philosophy of Law	3.0
Any two Political Science 300 and/or 400-level classes		8.0
Any three Economics classes numbered 250 or higher [†]		12.0
Any two Philosophy 400-level classes		6.0
PPE 450	Senior Seminar in Philosophy, Politics and Economics	4.0
Total Credits		189.0

[*]   For Analysis, take eitherMATH 101 and MATH 102, or MATH 172 and MATH 173 and any necessary prerequisites, For Calculus, take either MATH 116 and MATH 117 or MATH 121 and any necessary prerequisites.

[**] Recommended electives: HIST 222, HIST 315, or HIST 316.

[***] The 103 level class requires 102 and 101 (all 4 credits each) unless one tests out of 101 or 102. A student who tests out of 102 must take 103 and 201.

[†]   Recommended electives: ECON 301 and ECON 321.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
PPE 101	Introduction to Philosophy, Politics and Economics	3.0
UNIV H101	The Drexel Experience	1.0
Foreign Language class		4.0
Math Analysis or Calculus		4.0
	Term Credits	15.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0

ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
PSCI 120	History of Political Thought	4.0
Foreign Language class		4.0
Math Analysis or Calculus		4.0
	Term Credits	16.0
Term 3		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PHIL 105	Critical Reasoning	3.0
Diversity Studies class		3.0
Natural Science class		3.0
Arts & Humanities elective		3.0
	Term Credits	15.0
Term 4		
ECON 201	Principles of Microeconomics	4.0
PHIL 101	Introduction to Western Philosophy	3.0
PHIL 111	Symbolic Logic I	3.0
Natural Science class		3.0
Arts & Humanities elective		3.0
	Term Credits	16.0
Term 5		
ECON 202	Principles of Macroeconomics	4.0
PHIL 207	Symbolic Logic II	3.0
PSCI 110	American Government	4.0
Free Elective		3.0
Social & Behavioral Science class		3.0
	Term Credits	17.0
Term 6		
ECON 326 [WI]	Economic Ideas	4.0
PHIL 241	Social & Political Philosophy	3.0
PSCI 231 or 232	Qualitative and Mixed-Methods Research in Political Science Quantitative Research Methods in Political Science	4.0
Free Elective		3.0
Diversity Studies class		3.0
	Term Credits	17.0
Term 7		
SOC 210	Race, Ethnicity and Social Inequality	4.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Social & Behavioral Science class		3.0
Free Electives		9.0
	Term Credits	17.0
Term 8		
PHIL 251	Ethics	3.0
SOC 230	Gender and Society	4.0
Free Electives		6.0
International Studies class		3.0
	Term Credits	16.0
Term 9		
ECON 334	Public Finance	4.0
PSCI 210	American Political Development	4.0
International Studies class		3.0
Free Electives		4.0
	Term Credits	15.0
Term 10		
ECON 361	Health Economics	4.0
PSCI 252	Global Governance	4.0
SOC 355 [WI]	Classical Social Theory	4.0
PHIL 400-level Elective		3.0
	Term Credits	15.0
Term 11		

ECON 301	Microeconomics	4.0
PHIL 385	Philosophy of Law	3.0
SOC 356 [WI]	Contemporary Social Theory	4.0
PSCI Elective 300 or higher		4.0
	Term Credits	15.0
Term 12		
PPE 450	Senior Seminar in Philosophy, Politics and Economics	4.0
ECON Elective 250 or higher		4.0
PHIL 400-level Elective		3.0
PSCI Elective 300 or higher		4.0
	Term Credits	15.0

Total Credit: 189.0

Philosophy, Politics & Economics Faculty

Peter Amato, PhD *(Fordham University) Director, Philosophy*. Teaching Professor. Ethics, Marxism, Continental philosophy.

Debjani Bhattacharyya, PhD *(Emory University)*. Associate Professor. Urban history, South Asian history, environmental history, legal history, transnational history, post-colonial theory, subaltern studies, history of modern economic thought and feminist history.

Sebastien Bradley, PhD *(University of Michigan)*. Associate Professor. Public finance, international economics.

Zoltan Buzas, PhD *(Ohio State University)*. Assistant Professor. International relations theory, international security, race and politics, diplomatic history.

Zoltán Búzás, PhD *(Ohio State University)*. Assistant Professor. International relations theory, international security, race and politics, diplomatic history.

Erin R. Graham, PhD *(Ohio State University)*. Associate Professor. International institutions, international relations theory, global environmental politics.

Amelia Hoover Green, PhD *(Yale University)*. Associate Professor. Dynamics of conflict-related violence; intra-armed group politics and socialization; statistics in human rights.

Nathan Hanna, PhD *(Syracuse University)*. Associate Professor. Ethics, philosophy of law, philosophy of punishment

Roger A. McCain, PhD *(Louisiana State University) Co-director*. Professor. Computational economics, game theory.

Carol Mele, PhD *(University of Pennsylvania)*. Associate Teaching Professor. Ethical Theory, social and political philosophy, Rawls.

Joel E. Oestreich, PhD *(Brown University) Director of the Global Studies major*. Professor. International organizations, international finance, development, and human rights.

Flavia Padovani, PhD *(University of Geneva)*. Associate Professor. History and philosophy of science, epistemology, logic.

Rachel R. Reynolds, PhD *(University of Illinois)*. Associate Professor. Sociolinguistics, ethnography of communication and discourse analysis; violence against women in mass media; political economy of migration; semiotics including the textual, the visual and multimodal.

Andrew Smith, PhD *(SUNY, Stony Brook)*. Associate Professor. Philosophy, social and political philosophy, American philosophy.

Jose Tapia, PhD *(New School for Social Research).* Associate Professor. Social development, world economy, climate change, macroeconomic effects on health

Physics

Major: Physics
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 40.0801
Standard Occupational Classification (SOC) code: 19-2012

About the Program

Drexel's undergraduate program provides a solid foundation in physics suitable for graduate study or to branch out into other scientific or technical disciplines. The physics program offers an innovative curriculum in a top-notch learning environment: small class sizes, personal input from faculty, and close interaction with researchers who are leaders in their fields. Students explore the span of universal phenomenon— from the farthest reaches of astrophysics and cosmology, to molecular biophysics and subatomic particle physics— providing a solid foundation for continued study and exploration. Most undergraduates actively participate in research projects, including co-authoring publications and presenting results at conferences.

Virtually every course in the physics major is designed to extend the students' ability to handle real-world problems solved by state-of-the-art techniques. An important feature of the program is the large number of electives, which allow a student to pursue topics of special interest. There are numerous elective courses in areas as diverse as biophysics and cosmology, nanoscience and particle physics. Students can also choose electives to meet teacher certification requirements.

The Laboratory for High-Performance Computational Physics is a venue for students to become proficient in numerical techniques, parallel processing, electronic communication, and the basic computer languages and software relevant to advanced studies and research in physics.

The Department of Physics (http://www.drexel.edu/coas/academics/ departments-centers/physics/) conducts a broad array of outreach activities including the Kaczmarczik Lecture Series, public observing nights at the Lynch Observatory (http://www.physics.drexel.edu/ observatory/), and demonstrations in grade school performed by the Drexel Chapter of the Society of Physics Students (http://www.drexel.edu/ coas/academics/departments-centers/physics/student-organizations/ society-physics-students/) (SPS).

In addition to the physics major, the Department also offers a minor in physics as well as a minor in astrophysics (p. 141) and a minor in biophysics (p. 142).

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Core Physics Requirements		
PHYS 105	Computational Physics I	3.0
PHYS 113	Contemporary Physics I	5.0
PHYS 114	Contemporary Physics II	5.0
PHYS 115	Contemporary Physics III	5.0
PHYS 128	Introduction to Experimental Physics	3.0
PHYS 217	Thermodynamics	4.0
PHYS 311	Classical Mechanics I	4.0
PHYS 317	Statistical Mechanics	3.0
PHYS 321	Electromagnetic Fields I	4.0
PHYS 322	Electromagnetic Fields II	4.0
PHYS 326	Quantum Mechanics I	4.0
PHYS 327	Quantum Mechanics II	4.0
PHYS 328 [WI]	Advanced Laboratory	3.0
PHYS 491	Senior Research I	3.0
PHYS 492	Senior Research II	3.0
PHYS 493 [WI]	Senior Research III	3.0
PHYS 408	Physics Seminar (To be taken 3 times.)	3.0
Method Classes: Complete 12.0 credits from the following [*]		**12.0**
MATH 322	Complex Variables	
MATH 323	Partial Differential Equations	
MATH 331	Abstract Algebra I	
MATH 401	Elements of Modern Analysis I	
PHYS 160	Introduction to Scientific Computing	
PHYS 226	Instrumentation for Scientists I	
PHYS 227	Instrumentation for Scientists II	
PHYS 232	Observational Astrophysics	
PHYS 305	Computational Physics II	
PHYS 324	Topics in Mathematical Physics	
PHYS 325	Computational Physics III	
PHYS 405	Advanced Computational Physics	
Subject Courses: Complete 15.0 credits from the following: [**]		**15.0**
HNRS 301	Colloquium II (Special Relativity)	
PHYS 231	Introductory Astrophysics	
PHYS 233	Introduction to Relativity	
PHYS 262	Introduction to Biophysics	
PHYS 330	Introduction to Nuclear Physics	
PHYS 312	Classical Mechanics II	
PHYS 428	Quantum Mechanics III	
PHYS 431	Galactic Astrophysics	
PHYS 432	Cosmology	
PHYS 452	Solid State Physics	
PHYS 453	Nanoscience	
PHYS 461	Biophysics	
PHYS 462	Computational Biophysics	
PHYS 471	Nonlinear Dynamics	
PHYS 476	Particle Physics	
Math and Technical Requirements		
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 200	Multivariate Calculus	4.0
MATH 201	Linear Algebra	3.0-4.0
or MATH 261	Linear Algebra	
MATH 210	Differential Equations	4.0
MATH 291	Complex and Vector Analysis for Engineers	4.0
Sciences		
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
CHEM 103	General Chemistry III (OR Any Bio OR an ENGR class at 200 or higher)	5.0
CS 171	Computer Programming I	3.0
or CS 143	Computer Programming Fundamentals	
General Education		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0

or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV S101	The Drexel Experience	1.0
Liberal electives		9.0
Technical elective ***		3.0
Business elective		4.0
Free electives		24.0
Total Credits		180.0-181.0

*   At least 6 credits must have a PHYS subject code.

**   Courses at the 400 level and above will also be accepted.

***   Technical electives can be any course in BIO, CHEM, ENVS, GEO, MATH, PHYS, or any course from the College of Engineering.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121	Calculus I	4.0
PHYS 113	Contemporary Physics I	5.0
PHYS 128	Introduction to Experimental Physics	3.0
UNIV S101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
CS 143	Computer Programming Fundamentals	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122	Calculus II	4.0

PHYS 114	Contemporary Physics II	5.0
	Term Credits	15.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 200	Multivariate Calculus	4.0
PHYS 105	Computational Physics I	3.0
PHYS 115	Contemporary Physics III	5.0
	Term Credits	16.0
Term 4		
CHEM 101	General Chemistry I	3.5
MATH 201 or 261	Linear Algebra Linear Algebra	4.0
MATH 291	Complex and Vector Analysis for Engineers	4.0
PHYS 217	Thermodynamics	4.0
	Term Credits	15.5
Term 5		
CHEM 102	General Chemistry II	4.5
MATH 210	Differential Equations	4.0
PHYS 311	Classical Mechanics I	4.0
Subject course *		3.0
	Term Credits	15.5
Term 6		
One of the following:		3.0-5.0
CHEM 103	General Chemistry III	
Any Biology (BIO) course		
Any ENGR course 200-level or higher		
PHYS 326	Quantum Mechanics I	4.0
Method course *		3.0
Free elective		3.0
	Term Credits	13.0-15.0
Term 7		
PHYS 317	Statistical Mechanics	3.0
PHYS 327	Quantum Mechanics II	4.0
Method course		3.0
Business elective		3.0
Liberal studies elective		3.0
	Term Credits	16.0
Term 8		
PHYS 321	Electromagnetic Fields I	4.0
Two Subject courses		6.0
Technical elective		3.0
Free elective		3.0
	Term Credits	16.0
Term 9		
PHYS 322	Electromagnetic Fields II	4.0
PHYS 328 [WI]	Advanced Laboratory	3.0
Method course		3.0
Liberal studies elective		3.0
Business elective		3.0
	Term Credits	16.0
Term 10		
PHYS 408	Physics Seminar	1.0
PHYS 491	Senior Research I	3.0
UNIV S201	Looking Forward: Academics and Careers (Recommended only. For students persuing graduate study.)	1.0
Subject course		3.0
Liberal studies elective		3.0
Free elective		3.0
	Term Credits	14.0
Term 11		

PHYS 408	Physics Seminar	1.0
PHYS 492	Senior Research II	3.0
Subject course		3.0
Free electives		6.0
	Term Credits	13.0
Term 12		
PHYS 408	Physics Seminar	1.0
PHYS 493 [WI]	Senior Research III	3.0
Method course		3.0
Free electives		7.0
	Term Credits	14.0

Total Credit: 180.0-182.0

Co-op/Career Opportunities

Students who complete a degree in physics have many options. Some enter graduate school with the intention of obtaining a master's or a PhD. Others attend medical school. Engineering is yet another option, and graduates of an undergraduate physics program can enter this field with an unusually solid background in fundamental physical principles, mathematics, and computation. It is also possible for physics graduates to work in business and finance; for example, Wall Street employs many analysts trained in such "hard sciences" as physics.

Many Drexel physics graduates proceed directly into graduate schools, or medical or other professional programs. Physics graduates have attended some of the best graduate programs in the United States, including Columbia, Harvard, and CalTech. Other graduates have found jobs in engineering and business, and with such government agencies as the National Bureau of Standards.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) for more detailed information on co-op and post-graduate opportunities.

Facilities

Astrophysics Facilities:

- The Numerical Astrophysics Facility emphasizes theoretical and numerical studies of stars, star formation, planetary systems, star clusters, galaxy distributions, cosmological modeling, gravitational lensing, and the early universe. The facility employs a high-performance Graphics Processing Unit (GPU) compute cluster, each node containing two 6-core, 2.7 GHz Intel Xeon CPUs and 96 Gbytes of RAM, accelerated by 4–6 Nvidia Fermi/Titan GPUs, and connected by QDR infiniband, affording computational speeds of up to 50 trillion floating point operations per second.

- The Joseph R. Lynch Observatory houses a 16-inch Meade Schmidt-Cassegrain telescope equipped with an SBIG CCD camera.

- Drexel was a member of the original Sloan Digital Sky Survey (SDSS) collaboration; faculty and students remain active in analyzing data from the SDSS. Drexel is an institutional member of the Large Synoptic Survey Telescope (LSST), currently under construction in Chile; faculty and students are developing LSST-related machine learning tools and analyzing simulated LSST data to prepare for "first light" in 2022.

Biophysics Facilities:

- Bio-manipulation and microscopy laboratories. Four optical tables and six research grade microscopes are configured to perform microscopic spectroscopy and manipulation on solutions and individual cells. A spatial light modulator allows spatial patterns to be encoded on samples and explored; all microscopes are temperature controlled with state of the art cameras, including a 2,000 frame per second high speed system. Each optical table is also equipped with high power lasers for photolysis or fluorescence spectroscopy. Microfluidic attachments are present on one table, and in an adjacent laboratory, a small microfluidic fabrication facility has been established.

- Experimental biophysics lab for studies of proteins and biomimetic lipids, including a fluorescence spectrometer.

- The Computational Biophysics facility also includes: (i) a Beowulf cluster with 46 dual Quad-core hyperthreaded Xeon CPU (736 cores) and 12Gb of RAM nodes plus a master with 1Tb of storage and 24Gb of RAM, (ii) a Beowulf cluster with 44 dual-core Xeon CPU (344 cores),(iii) a dual Quad-core hyperthreaded Xeon CPU workstation with 24Gb RAM and 3Tb disk with two Tesla C2050 GPU CUDA-accelerated graphics card, (iv) a dual Quad-core hyperthreaded Xeon CPU workstation with 8Gb RAM and 4Tb disk with an NVIDIA N280 GPU CUDA-accelerated graphics card, (v) a quad 8-core hyperthreaded Xeon CPU workstation with 128Gb RAM and 16Tb total disk, (vi) a 72Tb file server with 12Gb RAM, (vii) a 96Tb quad 6-core file server with 64Gb RAM, (viii) and several Linux workstations connected through a gigabit network.

Condensed Matter Physics Research Facilities:

- The Energy Materials Research Laboratory is devoted to atomic scale investigations of materials for energy. As the size of the system shrinks, conventional bulk thermodynamics becomes irrelevant and we enter the realm of mesoscopic physics. The equilibrium behavior of small systems is governed by the prevailing number of surface atoms that behave differently from the bulk ones. The electronic properties are also subject to reduced number of available electronic states. We take advantage of different scanning probe microscopy and spectroscopy techniques to elucidate the local electronic properties of materials that are relevant to solving energy problems. The laboratory research is funded by grants from NSF and DOE.

- The Ultrafast Electron Diffraction Laboratory investigates structural dynamics in nanoscale materials at timescales that are fundamental to materials science and condensed matter physics. The techniques are based on exciting matter with light and probing the response of the lattice with electrons. The research interests of the lab are in a range of phenomena and systems including phase transformations induced by strong laser excitation, phase transformations in strongly correlated systems, generation and detection of coherent lattice vibrations, and characterization of materials properties of graphene, few-layer-graphene, ultra-thin graphite & nanocrystalline diamond.

- The Ultra-low Temperature Laboratory includes a dilution refrigerator, 3He and 4He cryostats and microwave sources to study quantum phenomena in nano and microscale devices, superconducting qubits, nanostructures and quantum fluids and solids.

- The Mesoscale Materials Laboratory investigates light-matter interactions and the extent and effects of ordering of lattice, charge and spin degrees of freedom on electronic phases and functional properties in solids, with an emphasis on bulk and epitaxial film complex oxides. Facilities include instrumentation for pulsed laser deposition of epitaxial complex oxide films, atomic layer deposition, variable-temperature characterization of carrier transport (DC to 20

GHz), and a laser spectroscopy lab enabling high-resolution Raman scattering spectroscopy at temperatures to 1.5 K and under magnetic field to 7 T.

Particle Physics Facilities:

- The Drexel Particle Physics Group researches fundamental neutrino properties with the DUNE long baseline experiment hosted by Fermilab and the PROSPECT short baseline reactor experiment located at Oak Ridge National Laboratory, as well as the planned nEXO neutrinoless double beta decay experiment.
- We are also active in the IceCube neutrino telescope located at the geographic South Pole.
- The Bubble Chamber Laboratory develops superheated-liquid detectors for rare-interaction searches, including the PICO dark matter experiment located at SNOLAB in Canada.

Laboratory for High-Performance Computational Physics:

- In addition to the department computing cluster (15 linux workstations), high-performance computing resources include a dual-processor server with two Xeon E5-2650 processors (16 cores), 128 GB of RAM, and two Xeon Phi P5110 co-processor cards (480 cores). Department researchers also have access to a cluster of 18 Dell PowerEdge C6145 servers (AMD Opteron 6378 Piledriver CPU's, 64 cores/server, 256 GB RAM/server) with a total of 1152 cores and 4.5TB RAM.

Physics Faculty

Alexey Aprelev, PhD *(St Petersburg State University)*. Assistant Teaching Professor. Experimental biophysics.

Eric Brewe, PhD *(Arizona State University)*. Associate Professor. Physics Education Research, introductory course reform, network analysis in learning, neuromechanisms of learning.

Luis R. Cruz Cruz, PhD *(MIT)*. Associate Professor. Computational studies of confinement effects on the folding of amyloidogenic proteins, spatial correlations of neurons in the brain, firing dynamics of neuronal networks, fluid flow through porous media.

N. John DiNardo, PhD *(University of Pennsylvania)*. Professor. Physics education research, surface physics, condensed matter physics, materials science.

Michelle Dolinski, PhD *(University of California, Berkeley) Associate Dean of Graduate Education*. Associate Professor. Neutrino physics, rare nuclear decays, cryogenic detector technologies.

Frank A. Ferrone, PhD *(Princeton University)*. Professor. Experimental and theoretical protein dynamics, kinetics of biological self-assembly, including sickle cell and Alzheimer's disease, sickle cell testing and diagnostic devices.

David M. Goldberg, PhD *(Princeton University) Associate Department Head for Undergraduate Studies*. Professor. Theoretical and computational cosmology, extragalactic astrophysics, gravitational lensing.

Goran Karapetrov, PhD *(Oregon State University)*. Professor. Experimental solid state physics, scanning probe microscopy, nanoscale catalysis, mesoscopic superconductivity.

Rachael M. Kratzer, PhD *(Drexel University)*. Assistant Teaching Professor. Quasars, active galactic nuclei

Charles Lane, PhD *(California Institute of Technology)*. Professor. Experimental tests of invariance principles and conservation laws, neutrino oscillations and properties.

Christina Love, PhD *(Temple University)*. Associate Teaching Professor. Educational methods and technology, STEM education, science literacy and outreach, particle physics, astrophysics.

Stephen L. W. McMillan, PhD *(Harvard University) Department Head*. Professor. Stellar dynamics, large-scale computations of stellar systems, and high-performance special-purpose computers.

Naoko Kurahashi Neilson, PhD *(Stanford University)*. Associate Professor. Neutrino physics, high energy astro-particle physics.

Russell Neilson, PhD *(Stanford University)*. Associate Professor. Dark matter, neutrino physics.

Gordon Richards, PhD *(University of Chicago)*. Professor. Quasars, active galactic nuclei, supermassive black holes, galaxy evolution, sky surveys, infrared/X-ray/radio astronomy

Jonathan E. Spanier, PhD *(Columbia University) Department Head, Mechanical Engineering and Mechanics*. Professor. Light-matter interactions in electronic materials, including ferroelectric semiconductors, complex oxide thin film science; laser spectroscopy, including Raman scattering.

Somdev Tyagi, PhD *(Brigham Young University) Associate Head of Non-Major Studies in Physics*. Professor. Nanobiophysics, Raman spectroscopy, magnetic materials.

Brigita Urbanc, PhD *(University of Ljubljana, Slovenia) Associate Department Head for Graduate Studies*. Professor. Computational and experimental biophysics of protein folding and assembly, relevant to Alzheimer's and Parkinson's disease; discrete molecular dynamics of coarse-grained protein and lipid models.

Jörn Venderbos, PhD *(Leiden University)*. Assistant Professor. Theory of quantum materials: topological Insulators, topological semimetals, materials prediction and design, strongly correlated electron materials, complex electronic ordering phenomena, unconventional superconductors

Michael Vogeley, PhD *(Harvard University) Associate Department Head for Graduate Studies*. Professor. Cosmology; galaxy formation and evolution; statistical analysis of large data sets; active galactic nuclei.

Emeritus Faculty

Shyamalendu Bose, PhD *(University of Maryland)*. Professor Emeritus.

Leonard D. Cohen, PhD *(University of Pennsylvania)*. Professor Emeritus.

Leonard X. Finegold, PhD *(University of London)*. Professor Emeritus.

Robert Gilmore, PhD *(Massachusetts Institute of Technology)*. Professor Emeritus.

Richard D. Haracz, PhD *(Wayne State University)*. Professor Emeritus.

Frederick House, PhD *(University of Wisconsin)*. Professor Emeritus.

Arthur P. Joblin, PhD *(Drexel University)*. Professor Emeritus.

Donald C. Larson, PhD *(Harvard University)*. Professor Emeritus.

Teck-Kah Lim, PhD *(University of Adelaide)*. Professor Emeritus.

Arthur E. Lord, PhD *(Columbia University)*. Professor Emeritus.

James McCray, PhD *(California Institute of Technology)*. Professor Emeritus.

Richard I Steinberg, PhD *(Yale University)*. Professor Emeritus.

T. S. Venkataraman, PhD *(Worcester Polytechnic Institute)*. Professor Emeritus.

Jian-Min Yuan, PhD *(University of Chicago)*. Professor Emeritus.

Political Science

Major: Political Science
Degree Awarded: Bachelor of Arts (BA)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 45.1001
Standard Occupational Classification (SOC) code: 19-3094

About the Program

The political science program in the Department of Politics (http://www.drexel.edu/coas/academics/departments-centers/politics/) helps students cultivate perspective, develop critical thinking and communication skills, and understand the economic, social, and political systems within which we live and work. Our curriculum builds on the department's research focuses and strengths. These include public policy, environmental politics, international organizations, human rights, and law and society. This flexible program allows students to shape a curriculum that meets their needs, whether they are preparing for public service, the business world, graduate school in political science, an MBA or other business program, or law school.

Degree Offered

The department offers a Bachelor of Arts (BA) in political science. Students may choose a substantive 'track' that best fits their needs and future goals. Our current tracks are: American Politics and Policy, International Politics, and Law and Politics.

The Bachelor of Arts (BA) provides a flexible course of study, which includes foreign language and allows for options in the fulfillment of humanities, social science, math, and science requirements.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
CIVC 101	Introduction to Civic Engagement	1.0
Two Math courses		6.0-8.0
Two Science courses*		6.0-8.0
Foundation Requirements		
Studies in Diversity electives		6.0
Three Consecutive Foreign Language courses (must complete level 201)**		11.0-12.0
Humanities/Fine Arts electives		12.0
Social Science electives		12.0
International Studies electives		6.0
Core Political Science Requirements		
PSCI 110	American Government	4.0
PSCI 120	History of Political Thought	4.0
PSCI 140	Comparative Politics I	4.0
PSCI 150	International Politics	4.0
Political Science Research Methods Sequence		
PSCI 131 [WI]	Research Design for Political Science	4.0
PSCI 231	Qualitative and Mixed-Methods Research in Political Science	4.0
PSCI 232	Quantitative Research Methods in Political Science	4.0
Intermediate Courses		**16.0**
Select four of the following courses:		
PSCI 210	American Political Development	
PSCI 220	Constitutional Law I	
PSCI 223	Comparative Political Thought	
PSCI 229	Theories of Justice	
PSCI 240	Comparative Politics II	
PSCI 250	American Foreign Policy	
PSCI 251	Global Governance	
PSCI 260 [WI]	Power in Protest: Social Movements in Comparative Perspective	
PSCI 330	Public Opinion & Propaganda	
PSCI 363	Constitutional Law II	
Political Science Electives ***		**32.0**
Free Electives		**33.0**
Total Credits		180.0-185.0

* Any Biology (BIO), Chemistry (CHEM), Geoscience (GEO), Nutrition (NFS), Physics (PHYS) or Environmental Science (ENVS) course.

** University requirement is two consecutive courses; the third language course, though listed here, is a departmental requirement.

*** Choose eight 200-level or above PSCI courses.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/

academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
UNIV H101	The Drexel Experience	1.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
PSCI 110	American Government	4.0
PSCI 150	International Politics	4.0
Foreign Language course		4.0
	Term Credits	16.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
PSCI 120	History of Political Thought	4.0
PSCI 131 [WI]	Research Design for Political Science	4.0
Foreign Language course		4.0
	Term Credits	16.0
Term 3		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PSCI 140	Comparative Politics I	4.0
Foreign Language course		3.0
Diversity Studies elective		3.0
Social Science elective		3.0
	Term Credits	16.0
Term 4		
PSCI 232	Quantitative Research Methods in Political Science	4.0
Choose one intermediate course		4.0
Mathematics course		3.0
Diversity Studies elective		3.0
Free elective		3.0
	Term Credits	17.0
Term 5		
PSCI 231	Qualitative and Mixed-Methods Research in Political Science	4.0
Choose one intermediate course		4.0
Social Science elective		3.0
Mathematics course		3.0
Free elective		3.0
	Term Credits	17.0
Term 6		
Choose one intermediate course		4.0
Political Science elective		4.0
Humanities/Fine Arts elective		3.0
Science elective		3.0
Free elective		3.0
	Term Credits	17.0
Term 7		
Political Science elective		4.0
Free electives		9.0
	Term Credits	13.0
Term 8		
Choose one intermediate course		4.0
Political Science elective		4.0
Humanities/Fine Arts elective		3.0
Social Science elective		3.0
	Term Credits	14.0
Term 9		
Social Science elective		3.0
Humanities/Fine Arts elective		3.0
Political Science elective		4.0
Free elective		3.0
	Term Credits	13.0
Term 10		
UNIV H201	Looking Forward: Academics and Careers	1.0
Social Science elective		3.0
Humanities/Fine Arts elective		3.0
Political Science elective		4.0
Free elective		3.0
	Term Credits	14.0
Term 11		
International Area Studies elective		3.0
Political Science electives		8.0
Free elective		3.0
	Term Credits	14.0
Term 12		
Political Science elective		4.0
International Area Studies elective		3.0
Free electives		6.0
	Term Credits	13.0

Total Credit: 180.0

Co-Op/Career Opportunities

Political science majors have a wide variety of co-op experiences from which to choose. Business and public utilities offer many lucrative possibilities, and local, state, and federal governments; museums and archives; and law firms present many additional interesting co-op placements. Pre-law students, for example, are especially eager to see the inside of a law office, whether the co-op job they receive is clerical or a more challenging paralegal assignment. These practical experiences in the "real" world can reinforce the lessons of the classroom, sharpen skills, and establish important contacts. Sample co-op positions include:

- Law clerk/paralegal, Joe Davidson, Attorney-at-Law, Philadelphia
- Research analyst, Legislative Office for Research Liaison, Harrisburg, PA
- Legislative intern, Corporate Public Affairs Division, Philadelphia Electric Company
- Assistant lobbyist, Government Relations Office, Drexel University
- Education intern, Philadelphia Museum of Art
- Researcher, Philadelphia Chamber of Commerce
- Assistant, Office of the Governor, Harrisburg, PA

Career Opportunities

The flexible programs allow students to shape a curriculum that meets their needs, whether they are preparing for the business world, graduate school in history or political science, the Department's Masters Program in Science, Technology, and Society (http://drexel.edu/coas/academics/

departments-centers/science-technology-society/), an MBA or other business program, or law school.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Politics Faculty

Phillip Ayoub, PhD *(Cornell University)*. Assistant Professor. International relations, comparative politics, transnational social movements, marginalized groups

Zoltan Buzas, PhD *(Ohio State University)*. Assistant Professor. International relations theory, international security, race and politics, diplomatic history.

Zoltán Búzás, PhD *(Ohio State University)*. Assistant Professor. International relations theory, international security, race and politics, diplomatic history.

Rose Corrigan, PhD *(Rutgers University) Director of the Center for Law, Policy, and Social Action*. Associate Professor. Women, public law, American politics and policy.

Richardson Dilworth, PhD *(Johns Hopkins University) Director, Center for Public Policy*. Professor. American political development, urban politics, public policy.

Erin R. Graham, PhD *(Ohio State University)*. Associate Professor. International institutions, international relations theory, global environmental politics.

Amelia Hoover Green, PhD *(Yale University)*. Associate Professor. Dynamics of conflict-related violence; intra-armed group politics and socialization; statistics in human rights.

Christian Hunold, PhD *(University of Pittsburgh)*. Professor. Environmental policy; comparative politics; urban wildlife; political theory.

Alison Kenner, PhD *(Rensselaer Polytechnic Institute)*. Associate Professor. Science, technology, and health; environmental health problems; cities and place; feminist theory; medical anthropology; digital humanities

Joel E. Oestreich, PhD *(Brown University) Director of the Global Studies major*. Professor. International organizations, international finance, development, and human rights.

Gwen Ottinger, PhD *(University of California, Berkeley)*. Associate Professor. Social studies of science and technology, environmental justice, science and engineering ethics, citizen science, environmental ethics.

William L. Rosenberg, PhD *(Temple University)*. Professor. Behavioral politics, public opinion, and political communication.

Jack Santucci, PhD *(Georgetown University)*. Assistant Teaching Professor. Electoral Systems, Political Parties, American Political Development.

Chloe Silverman, PhD *(University of Pennsylvania) Director, Center for Science, Technology & Society*. Associate Professor. Parent advocacy for autism, neurodiversity, and pollinator health research.

Jose Tapia, PhD *(New School for Social Research)*. Associate Professor. Social development, world economy, climate change, macroeconomic effects on health

Emeritus Faculty

Julie Mostov, PhD *(New York University)*. Professor Emeritus. Modern political thought, democratic theory, nationalism, gender studies, South Eastern Europe and the Balkans.

Psychology

Major: Psychology
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 42.0101
Standard Occupational Classification (SOC) code: 19-3031

About the Program

Drexel University's Department of Psychology is a tight-knight, active community of internationally known faculty and impressive student scholars. The department defines psychology as a science of mind and behavior. From the neurophysiological underpinnings of cognition to defining the impact of human behaviors within the judicial systems and policies. Psychology contributes the human behavioral aspects to other fields, including STEM, medicine, law, arts and social sciences. Our students work alongside professors on cutting-edge research and clinical projects in a range of areas, including health, forensic, neuropsychology, human development, experimental, cognitive and clinical psychology. Undergraduates also benefit from Drexel's cooperative education program, gaining hands-on, extensive work experience in areas of their interest.

Bachelors of Science in Psychology

Students in the Bachelor of Science in Psychology program learn how to ask and answer important questions regarding human behavior, cognition and emotion, and how to apply their findings to improve lives. Within the program, students have the option to concentrate in specific areas:

Mind, Brain and Behavior

The Mind, Brain and Behavior (MBB) area of focus allows psychology majors to concentrate their plan of study on how the mind and brain produce human behavior. Situating the mind within its biological substrate is one of the great scientific challenges of the 21st centruy. MBB covers introductory through advanced courses, exposing students to the formal study of the human mind and behavior and their underlying brain systems and structures

Human Development

This area allows students to focus on issues affecting human development across the lifespan. Using a biological, cognitive and socio-emotional perspective, students gain both breadth and depth in the understanding of current issues in child, adolescent and adult development.

Clinical and Health

For those interested in health and service careers, this area of focus includes coursework, experiential learning, and individualized mentorship, providing students with practical experience in the field.

Combined Bachelors/Masters Degree

There is an accelerated MS program entitled the Psychology BS/MS Scholars program to which undergraduates may apply. For more information, visit the Drexel University Department of Psychology (http://www.drexel.edu/coas/academics/departments-centers/psychology/) homepage.

Additional Information

To schedule an appointment students should contact the Psychology department's academic advisor:

Devon M. Thomas
Academic Advisor, Undergraduate Program
Phone: 215-895-0487
Email: dmt356@drexel.edu
Office: Stratton 103A

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

College Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COM 230	Techniques of Speaking	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
Select one of the following:		8.0
MATH 101 & MATH 102	Introduction to Analysis I and Introduction to Analysis II	
MATH 121 & MATH 122	Calculus I and Calculus II	
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Business elective		4.0
Fine Arts elective		3.0
Anthropology (ANTH) elective		3.0
English (ENGL) electives, 200-level or above		6.0
History (HIST) electives		8.0
Philosophy (PHIL) elective		3.0
Political Science (PSCI) elective		4.0
Sociology (SOC) elective		3.0
Select one of the following sequences:		8.0
Biology		
BIO 107	Cells, Genetics & Physiology	
BIO 108	Cells, Genetics and Physiology Laboratory	
BIO 109	Biological Diversity, Ecology & Evolution	
BIO 110	Biological Diversity, Ecology and Evolution Laboratory	
Chemistry		
CHEM 111	General Chemistry I	
CHEM 112	General Chemistry II	
Physics		
PHYS 103	General Physics I	
PHYS 104	General Physics II	
Free electives		49.0
Departmental Requirements		
General Psychology Requirements		
PSY 111	Pre-Professional General Psychology I [*]	3.0
PSY 112	Pre-Professional General Psychology II [*]	3.0
100-Level Requirements		
Select two of the following:		6.0
PSY 120	Developmental Psychology	
PSY 140	Approaches to Personality	
PSY 150	Introduction to Social Psychology	
Required Psychology Courses		
PSY 212	Physiological Psychology	3.0
PSY 240 [WI]	Abnormal Psychology	3.0
PSY 264	Computer-Assisted Data Analysis I	3.0
PSY 265	Computer-Assisted Data Analysis II	3.0
PSY 280	Psychological Research I	3.0
PSY 290	History and Systems of Psychology	3.0
PSY 325	Psychology of Learning	3.0
PSY 330	Cognitive Psychology	3.0
PSY 360 [WI]	Experimental Psychology	3.0
PSY 380	Psychological Testing and Assessment	3.0
Advanced Psychology Electives		
Any non-required PSY course at the 200-level or above.		12.0
Senior Seminar Sequence OR Psychology Electives [**]		
PSY 490 [WI]	Psychology Senior Thesis I	4.0
PSY 491 [WI]	Psychology Senior Thesis II	4.0
PSY 492 [WI]	Psychology Senior Thesis III	4.0
Total Credits		180.0

[*]   Students with AP psychology, or transfer students with PSY 101 credit, should check the AP Student Placement Exam Crosswalk (http://www.drexel.edu/provost/policies/pdf/supporting/ap_crosswalk.pdf) or check with their advisor.

[**]   Students who do not wish to complete the research seminar sequence are required to complete 12.0 credits of additional advanced Psychology electives instead.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses

with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
PSY 111	Pre-Professional General Psychology I	3.0
MATH 121 or 101	Calculus I Introduction to Analysis I	4.0
UNIV H101	The Drexel Experience	1.0
Select one of the following:		4.0
CHEM 111	General Chemistry I	
PHYS 103	General Physics I	
BIO 107 & BIO 108	Cells, Genetics & Physiology	
	Term Credits	15.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102 or 122	Introduction to Analysis II Calculus II	4.0
PSY 112	Pre-Professional General Psychology II	3.0
Select one of the following:		4.0
BIO 109 & BIO 110	Biological Diversity, Ecology & Evolution	
CHEM 112	General Chemistry II	
PHYS 104	General Physics II	
Select one of the following:		3.0
PSY 120	Developmental Psychology	
PSY 140	Approaches to Personality	
PSY 150	Introduction to Social Psychology	
	Term Credits	18.0
Term 3		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PSY 240 [WI]	Abnormal Psychology	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Select one of the following:		3.0
PSY 120	Developmental Psychology	
PSY 150	Introduction to Social Psychology	
PSY 140	Approaches to Personality	
Anthropology (ANTH) elective		3.0
Fine Arts elective		3.0
	Term Credits	16.0
Term 4		
PSY 264	Computer-Assisted Data Analysis I	3.0
PSY 290	History and Systems of Psychology	3.0
English (ENGL) elective, 200-level or above		3.0
Political Science (PSCI) elective		4.0
Sociology (SOC) elective		3.0
	Term Credits	16.0
Term 5		
COM 230	Techniques of Speaking	3.0
PSY 265	Computer-Assisted Data Analysis II	3.0

PSY 330	Cognitive Psychology	3.0
English (ENGL) elective, 200-level or above		3.0
Philosophy (PHIL) elective		3.0
	Term Credits	15.0
Term 6		
PSY 212	Physiological Psychology	3.0
PSY 280	Psychological Research I	3.0
PSY 360 [WI]	Experimental Psychology	3.0
Psychology elective		3.0
Business elective		4.0
	Term Credits	16.0
Term 7		
PSY 325	Psychology of Learning	3.0
PSY 380	Psychological Testing and Assessment	3.0
Psychology elective		3.0
History elective		4.0
Free elective		3.0
	Term Credits	16.0
Term 8		
Psychology elective[*]		3.0
History elective		4.0
Free electives		7.0
	Term Credits	14.0
Term 9		
Psychology elective[*]		3.0
Free electives		12.0
	Term Credits	15.0
Term 10		
PSY 490 [WI][**]	Psychology Senior Thesis I	4.0
Free electives		9.0
	Term Credits	13.0
Term 11		
PSY 491 [WI][**]	Psychology Senior Thesis II	4.0
Free electives		9.0
	Term Credits	13.0
Term 12		
PSY 492 [WI][**]	Psychology Senior Thesis III	4.0
Free electives		9.0
	Term Credits	13.0

Total Credit: 180.0

*   See degree requirements (p. 116).

**   Students who do not wish to complete the research seminar sequence are required to complete 12.0 credits of additional advanced Psychology electives instead.

Co-op/Career Opportunities

Some graduates seek employment immediately after receiving their bachelor's degrees.They are well trained to work as research assistants in consulting firms and medical settings or to provide front-line services in mental health and educational settings. Other graduates go on to professional schools in law, business, medicine, and other health professions. Still others pursue graduate training in psychology and related fields. Students build skills and knowledge that provide a foundation for advanced study, create opportunities for future growth, and can be used to improve the quality of life for others.

Co-Op Experiences

Drexel University has long been known for its co-operative education programs, through which students mix periods of full-time, career-related

employment with their studies. Co-op/internship employment is an option for psychology majors. Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Psychology Faculty

Meghan Butryn, PhD *(Drexel University).* Associate Professor. Treatment and prevention of obesity and eating disorders, behavioral treatment, acceptance and commitment therapy.

Dorothy Charbonnier, PhD *(State University of New York at Stony Brook).* Associate Teaching Professor. The nature of the creative process and writing.

Evangelia Chrysikou, PhD *(Temple University).* Associate Professor. Cognitive neuroscience, neuropsychology, neural basis of language, memory, and executive functions, neurocognitive processes associated with problem solving and flexible thought

Douglas L. Chute, PhD *(University of Missouri) Louis and Bessie Stein Fellow.* Professor. Neuropsychology and rehabilitation; technological applications for the cognitively compromised and those with acquired brain injuries.

Brian Daly, PhD *(Loyola University, Chicago) Interim Department Head.* Associate Professor. Pediatric neuropsychology, intervention with at-risk youth.

David DeMatteo, PhD, JD *(MCP Hahnemann University; Villanova University School of Law) Director of the JD-PhD Program in Law and Psychology.* Professor. Psychopathy, forensic mental health assessment, drug policy; offender diversion.

Evan M. Forman, PhD *(University of Rochester) Director WELL Center.* Professor. Clinical psychology: mechanisms and measurement of psychotherapy outcome, cognitive-behavioral and acceptance based psychotherapies, the development and evaluation of acceptance-based interventions for health behavior change (for problems of obesity and cardiac disease) as well as mood and anxiety disorders; neurocognition of eating.

Pamela Geller, PhD *(Kent State University) Director, Clinical Training.* Associate Professor. Stressful life events and physical and mental health outcomes, particularly in the area of women's reproductive health (e.g. pregnancy, pregnancy loss, infertility, medical education).

Maureen Gibney, PsyD *(Widener University).* Teaching Professor. Clinical psychopathology; neuropsychological evaluation and intervention with the elderly.

Naomi Goldstein, PhD *(University of Massachusetts) Co-Director of the JD-PhD Program; Stoneleigh Foundation Fellow.* Professor. Forensic psychology; juvenile justice; Miranda rights comprehension; false confessions; juvenile justice treatment outcome research; anger management intervention development; child and adolescent behavior problems.

Kirk Heilbrun, PhD *(University of Texas at Austin).* Professor. Forensic psychology, juvenile and adult criminality, violence risk assessment, forensic psychological assessment, treatment of mentally disordered offenders, academic-sports mentoring.

Adrienne Juarascio, PhD *(Drexel University) Director, Practicum Training.* Assistant Professor. Enhancing treatment outcomes for eating disorders

and obesity; Acceptance-based behavioral treatments; Evaluating mechanisms of action in behavioral treatments

Marlin Killen, PhD *(Trident University International).* Teaching Professor. Authentic teaching methods in Psychology as well as student persistence behavior.

John Kounios, PhD *(University of Michigan) Director, PhD Program in Applied Cognitive and Brain Sciences.* Professor. Cognitive neuroscience, especially creativity, problem solving, and cognitive enhancement.

David Kutzik, PhD *(Temple University).* Professor. Social and cultural theory, political economy, gerontology, materialisms, activity theory, reflection theories, communities of practice and labor theories of culture.

Michael Lowe, PhD *(Boston College).* Professor. Prevention and treatment of eating disorders and obesity; effects of appetitive responsiveness and dietary restraint on eating regulation; psychobiology of obesity-proneness; empirical foundations of unconscious processes.

John Medaglia, PhD *(The Pennsylvania State University).* Assistant Professor. Applying models and methods developed in neuropsychology, cognitive neuroscience and graph theory to understand and treat brain dysfunction and enhance healthy functioning

Megan Meyer, PhD *(Temple University).* Assistant Teaching Professor. Influences on preferred body type; changes in body image, self-esteem, and self-efficacy in females as a function of strength training; Sensation and Perception

Danette Morrison, PhD *(University of Maryland - College Park).* Assistant Teaching Professor. Social and academic motivation within school context; Social relationships and identity development; Educational attainment of ethnic minorities

Arthur Nezu, PhD, DHLL, ABPP *(State University of New York at Stony Brook).* Distinguished University Professor of Psychology, Professor of Medicine, Professor of Community Health and Prevention. Behavioral medicine applications of problem-solving therapy and other cognitive-behavior therapies (e.g., to decrease emotional and psychosocial risk factors; improve adherence), particularly with regard to patients with cardiovascular disease; assessment.

Christine Maguth Nezu, PhD *(Fairleigh Dickinson University).* Professor of Psychology, Professor of Medicine. Cognitive-behavioral assessment and treatment for mood, anxiety, personality disorders, and coping with chronic illness; mind/body studies; stress and coping; developmental disabilities and comorbid behavioral and emotional disorders; spirituality and psychology.

Karol Osipowicz, PhD *(Thomas Jefferson University).* Associate Teaching Professor. The application of advanced neuroimaging to the study of human brain function and anatomy.

Nancy Raitano Lee, PhD *(University of Denver) Director of MS and BS/MS Programs.* Associate Professor. Neuropsychological and neuroanatomic correlates of intellectual and developmental disabilities; Verbal memory and language difficulties in Down syndrome and other genetic disorders; Comorbid autism spectrum disorder symptoms in youth with genetic disorders; Neuroanatomic correlates of individual differences in typical and atypical cognition

Diana Robins, PhD *(University of Connecticut) Interim Director, AJ Drexel Autism Institute.* Professor. Autism screening, early detection of autism

Ludo Scheffer, PhD *(University of Pennsylvania) Director of Undergraduate Studies.* Teaching Professor. Meta-cognitive development, writing, and computers; Language and literacy development in the early years in the context of family and schooling; Youth-at-risk; School violence and bullying; Program/intervention effectiveness

Maria Schultheis, PhD *(Drexel University) Vice Provost of Research, Office of Research and Innovation.* Professor. Clinical Neuropsychology and rehabilitation following neurological compromise (brain injury, stroke, multiple sclerosis), application of technologies in psychology. Specialization in the use of virtual reality (VR) simulation, and evaluation of the demands of driving after disability.

Jennifer Schwartz, PhD *(Idaho State University) Director of Psychological Services Center.* Teaching Professor. Adult psychopathology; evidence-based clinical practice; competency-based training; competency-based clinical supervision.

Julia Sluzenski, PhD *(Temple University).* Assistant Teaching Professor. Spatial and episodic memory, memory loss across the lifespan, developmental psychology.

J. Michael Williams, PhD *(University of Vermont).* Associate Professor. Memory disorder; traumatic brain injury; auditory neglect; neuropsychological assessment; recovery and rehabilitation of brain function; functional magnetic resonance imaging.

Fengqing (Zoe) Zhang, PhD *(Northwestern University).* Associate Professor. Neuroimaging data analysis; Data mining; Bayesian inference; High dimensional data analysis

Eric A Zillmer, PsyD *(Florida Institute of Technology) Carl R. Pacifico Professor of Neuropsychology and the Director of Athletics.* Professor. Psychological assessment (neuropsychological, cognitive, personality), psychiatric and neurological disorders, behavioral medicine, neurogerontology, mathematical modeling, sports psychology, psychology of genocide.

Emeritus Faculty

Donald Bersoff, JD, PhD *(Yale University, New York University).* Professor Emeritus. Law and psychology; mental health law.

James Calkins, PhD. Professor Emeritus.

Thomas Hewett, PhD *(University of Illinois at Urbana-Champaign).* Professor Emeritus. Human computer interaction and cognitive engineering; development of computing environments to support knowledge, workers, and high performance experts.

Myrna Shure, PhD *(Cornell University).* Professor Emeritus. Child development, problem-solving interventions with children, prevention programs.

Mary Spiers, PhD *(University of Alabama at Birmingham).* Professor Emeritus. Clinical neuropsychology and medical psychology; memory and practical applications for memory disorders in the elderly; cognitive health of women.

Sociology

Major: Sociology
Degree Awarded: Bachelor of Arts (BA)
Calendar Type: Quarter
Total Credit Hours: 182.0

Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 45.1101
Standard Occupational Classification (SOC) code: 19-3041

About the Program

The sociology major at Drexel University has three components: theory, methods, substantive coursework and features specialized coursework relating to social justice issues.

Sociology is the systematic study of societies. Society is the sum total of individual and group interaction and relations, from small groups and families to global networks and complex social organizations. The discipline covers a wide variety of fields of inquiry. Sociologists examine structural relations—how human society is organized from small groups to large institutions—and is committed to developing a *critical understanding* of these relationships. Thus the sociology major stresses theory, research methods, quantitative and qualitative data analysis as applied to a wide variety of substantive areas including but not limited to social inequality, political power, gender, class, race, ethnicity, family, crime, technology and environmental change as well as a wide variety of social and political movements connected with social change. The stress on *critical understanding* means that sociology majors will strive not only to develop strong analytic abilities but an intellectual and ethical engagement reflected in sociologically informed thinking and action.The research and analytical skills developed in our program are sought after by a wide variety of professions.

Specialized social justice coursework is typically carried out in connection with community groups and organizations. It is a way the Sociology Program and Drexel University as a whole seek to become practically engaged with the wider community while promoting social justice.

For more information about the sociology major, visit the Department of Sociology (http://www.drexel.edu/coas/academics/departments-centers/sociology/) web page.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Requirements

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Four Humanities/Fine Arts Courses		12.0
Two Mathematics Courses		6.0
Two Science Courses		6.0
Two Consecutive Foreign Language Courses [*]		8.0
Social and Behavioral Sciences		**12.0**
SOC 101	Introduction to Sociology	
Social and Behavioral Sciences Electives (9.0 credits)		
International Studies		**6.0**

Two International Studies Courses		
Studies in Diversity		**6.0**
Two Studies in Diversity Courses		
Sociology Core Requirements		
Required Major Capstone		**4.0**
SOC 450	Capstone in Sociology	
Theory Sequence		**8.0**
SOC 355 [WI]	Classical Social Theory	
SOC 356 [WI]	Contemporary Social Theory	
Methods Sequence		**8.0**
SOC 241	Research Design: Qualitative Methods	
SOC 242	Research Design: Quantitative Methods	
Required Sociology Electives		**40.0**
Select at least 10 of the following: (At least four must be at the 300 or 400 level; and at least one must be at the 400-level.)		
SOC 115	Social Problems	
SOC 210	Race, Ethnicity and Social Inequality	
SOC 215	Sociology of Work	
SOC 220	Wealth and Power	
SOC 221	Sociology of the Family	
SOC 222	Sex and Society	
SOC 230	Gender and Society	
SOC 235	Sociology of Health and Illness	
SOC 238	Sociology of Health Professions	
SOC 240	Urban Sociology	
SOC 244	Sociology of the Environment	
SOC 268	Sociology of Sport	
SOC 271	Sociology of Aging	
SOC 276	Global Climate Change	
SOC 313	Sociology of Global Health	
SOC 315	HIV/AIDS and Africa	
SOC 318	Social Networks and Health	
SOC 320	Sociology of Deviance	
SOC 330	Development and Underdevelopment in the Global South	
SOC 340	Globalization	
SOC 341	Environmental Movements in America	
SOC 346	Environmental Justice	
SOC 349	Sociology of Disasters	
SOC 370	Practicum in Applied and Community Sociology	
SOC 405	Medicine, Technology and Science	
SOC 406	Housing and Homelessness	
SOC 410	Imagining Multiple Democracies	
SOC 420	Love, Rage & Debt: The Debt Society	
SOC 430	Politics of Life	
SOC 444	Social Movements	
SOC 490	Sociology Research Seminar I: Research Design	
SOC 491	Sociology Research Seminar II: Data Acquisition and Analysis	
SOC 492	Sociology Research Seminar III: Practicum in Sociological Research	
SOC T380	Special Topics in SOC	
Free Electives		**54.0**
Total Credits		182.0

*   At least one foreign language course must be at the 200-level. In addition, the department recommends students take 2 additional foreign language courses as free electives.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
SOC 101	Introduction to Sociology	3.0
UNIV H101	The Drexel Experience	1.0
Foreign Language Course		4.0
Mathematics course		3.0
	Term Credits	14.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
Social and Behavioral Science Elective		3.0
Foreign Language Course		4.0
Sociology Required Elective		4.0
	Term Credits	15.0
Term 3		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
Diversity Studies Elective		3.0
Free elective		6.0
	Term Credits	12.0
Term 4		
SOC 241	Research Design: Qualitative Methods	4.0
Sociology Required Elective		8.0
Mathematics Course		3.0
	Term Credits	15.0
Term 5		
SOC 242	Research Design: Quantitative Methods	4.0
Sociology Required Elective		4.0
Science Course*		3.0
Free Elective		3.0
Humanities/Fine Arts Elective		3.0
	Term Credits	17.0
Term 6		
SOC 355 [WI]	Classical Social Theory	4.0
Social and Behavioral Sciences Elective		3.0

Diversity Studies Elective		3.0
Free Elective		6.0
	Term Credits	16.0
Term 7		
SOC 356 [WI]	Contemporary Social Theory	4.0
Sociology Required Elective (300-level)		4.0
Social and Behavioral Sciences Elective		3.0
Free Elective		6.0
	Term Credits	17.0
Term 8		
UNIV H201	Looking Forward: Academics and Careers	1.0
Sociology Required Elective		4.0
Free Elective		6.0
Sociology Required Elective (300-level)		4.0
	Term Credits	15.0
Term 9		
Sociology Required Elective (300-level)		4.0
Humanities/Fine Arts Elective		3.0
International Studies Elective		3.0
Free Elective		6.0
	Term Credits	16.0
Term 10		
Sociology Required Elective		4.0
Humanities/Fine Arts Elective		3.0
Free Elective		6.0
Science Course[*]		3.0
	Term Credits	16.0
Term 11		
Sociology Required Elective (400-level)		4.0
Humanities/Fine Arts Elective		3.0
Free Elective		6.0
	Term Credits	13.0
Term 12		
SOC 450	Capstone in Sociology	4.0
International Studies Elective		3.0
Humanities/Fine Arts Elective		6.0
Free Elective		3.0
	Term Credits	16.0

Total Credit: 182.0

[*]   See degree requirements (p. 119).

Co-op/Career Opportunities

An undergraduate degree in sociology is excellent preparation for law school, medical school, or for graduate work in such fields as sociology, history, gerontology, or political science.

Outside of academics, sociologists work in a wide variety of settings. Some serve as statistical analysts for market research firms, health care agencies, and government. Others are involved in urban planning, survey research, public relations, agency management, trend analysis, or criminal justice. There are sociologists of religion working for national church organizations, and sociologists specializing in gerontology who are engaged in research or administration for agencies concerned with the aged.

Co-op Experiences

Some recent co-op positions held by sociology students include the following:

- Human Resources Assistant, National Board of Medical Examiners (http://www.nbme.org/)
- Giving Corps Intern, Cradles to Crayons (http://www.nbme.org/)
- Organizing Internship, Food & Water Watch (https://www.foodandwaterwatch.org/)
- Marketing Intern, Stradley Ronon Stevens & Young LLP (http://www.stradley.com/)
- Small Business Outreach Co-op, The Welcoming Center for New Pennsylvanians (http://welcomingcenter.org/)

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Sociology Faculty

Susan Bell, PhD *(Brandeis University) Department Head, Sociology*. Professor. The interaction between patient cultures and embodied health movements; changing culture and structure of biomedicine; the experience of illness, women's health, and narrative representations of the politics of cancer, medicine, and women's bodies.

Jessica Cohen , PhD *(Bowling Green State University)*. Associate Teaching Professor. Family demography

Mary Ebeling, PhD *(University of Surrey) Director, Women's and Gender Studies*. Associate Professor. Science and technology studies; emerging technologies and biocapital; media and democratic cultures; radical social movements; sociology of markets; political sociology; and ethnographic methodologies.

Sarah Hosman, PhD *(Boston University)*. Assistant Teaching Professor. Urban sociology, Gentrification, Cultural sociology, Economic Sociology, Narratives of place, Ethnography

Sonali Jain, PhD *(Boston University)*. Associate Teaching Professor. South Asia, Race, Ethnicity, Gender, Transnationalism.

Kelly Joyce, PhD *(Boston College) Director, Master's Program in Science Technology & Society*. Professor. Science, medicine and technology; aging and technology; qualitative social science methods; healthcare and medicine.

Emmanuel F. Koku, PhD *(University of Toronto)*. Associate Professor. Social network analysis; qualitative/quantitative research; medical sociology; social epidemiology; social demography; sociology of development; communication and information technology; community and urban sociology.

Nada Matta, PhD *(New York University)*. Assistant Professor. Political Economy, Social Movements, Middle East Studies, Gender Studies, Revolutions, Inequality.

Elizabeth McGhee Hassrick, PhD *(University of Chicago)*. Assistant Research Professor. Social network interventions that promote positive outcomes for people with ASD, their families and communities

Amanda McMillan Lequieu, PhD *(University of Wisconsin-Madison)*. Assistant Professor. Environmental sociology, political economy, place and space, rural-urban interface, qualitative and historical methodologies.

Kevin Moseby, PhD *(University of California-San Diego)*. Assistant Teaching Professor. The social and cultural studies of biomedicine/health, particularly as those domains intersect with and through the institutions

of race/sexuality/gender, social movements/community advocacy, HIV/AIDS, racial health disparities, science and technological studies, and Black Studies

Jason Orne, PhD *(University of Wisconsin-Madison)*. Assistant Professor. Urban Sociology, Sexualities Studies, Qualitative Methodologies, Sociology of Race and Ethnicity, Social Psychology, Social Theory

Mimi Sheller, PhD *(New School for Social Research) Director, Center for Mobilities Research and Policy*. Professor. Sustainable mobility and mobility justice: new cultures and infrastructures of travel, transport, mobile communication, and urbanism; Caribbean Studies: history, culture and political theory of the region, including intersections of race, ethnicity, gender, sexuality and class.

Arthur Shostak, PhD *(Princeton University)*. Professor Emeritus. Futurism, race and ethnic relations, social implications of 20th century technology, urban sociology.

Diane Sicotte, PhD *(Arizona State University)*. Associate Professor. Sociology of environmental injustice: inequalities in the citing of environmental hazards; community-based research in neighborhoods dealing with industrial hazards; sociology of the environment; urban sociology; social inequalities.

Kelly Underman, PhD *(University of Illinois at Chicago)*. Assistant Professor. Medical education, the social construction of bodies and emotions and the politics of scientific knowledge production.

Emeritus Faculty

Robert J. Brulle, PhD *(George Washington University)*. Professor Emeritus. Environmental policy and politics, critical theory, marine risk, social movements, environmental sociology.

English BA and Publishing MA

Major: English and Publishing
Degrees Awarded: Bachelor of Arts (BA) and Master of Arts (MA)
Calendar Type: Quarter
Total Credit Hours: 230.0
Co-op Options: Two Co-op (Five years)
Classification of Instructional Programs (CIP) code: 23.0101
Standard Occupational Classification (SOC) code: 25-1123

About the Program

In keeping with Drexel University's commitment to experiential learning, the accelerated degree program of a BA in English and an MA in Publishing offers students the opportunity to graduate in five years with two separate six-month co-op experiences and a Masters degree, which also includes many opportunities for hands-on experience.

Drexel's unique quarter system allows English majors with considerable flexibility within their course of study. Students can focus on writing, literary criticism, or comparative literature, for example, while also enhancing the breadth and depth of their education with courses taught in other departments and programs across the University. Drexel Publishing Group (DPG) is a unique part of the English department. DPG is solely responsible for three publications, each one unique and vital: Painted Bride Quarterly, one of the nation's oldest literary magazines; 5027mac.org, a news and culture blog written by our students; and The 33rd, the only university-based text in the United States that includes interdisciplinary, multi-genre pieces written by students at all levels

and faculty as well. DPG and its activities are the overlapping element between our undergraduate and graduate programs, with student at all levels working together to make each element more successful.

Drexel's Masters of Arts in Publishing is interdisciplinary, offering courses in law, marketing, and graphic design. Instructors come from all areas of publishing: from newspapers to small presses, from online venues to academic presses. Classes often feature guest speakers who are also currently working in the industry, such as small press founders, trade magazine editors, agents, and more. Course instructors and guest speakers inform students and broaden perspectives on career opportunities in the publishing industry.

Admission Requirements

Students must apply when their undergrad status is at a minimum of 90.0 credits and a maximum of 120.0 credits.

Degree Requirements

Undergraduate Requirements:

University Requirements:		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Two Mathematics Courses		**8.0**
Two Natural Science Courses		**6.0**
Two Foreign Language Courses		**8.0**
Any two (2) consecutive foreign language courses (completing level 201)		
Humanities and Fine Arts		
Select four of the following:		12.0
ARTH 101	History of Art I: Ancient to Medieval	
ARTH 102	History of Art II: Renaissance to Romanticism	
ARTH 103	History of Art III: Modern Art	
DANC 115	Introduction to Dance	
DANC 215	Dance Appreciation	
DANC 315	Twentieth Century Dance	
FMST 150	American Classic Cinema	
FMST 250	The Documentary Tradition	
FMST 355	Contemporary Cinema	
FMVD 218	Intermediate Cinematography	
MUSC 130	Introduction to Music	
MUSC 231	Music History I	
MUSC 232	Music History II	
MUSC 236	Rock Music Through the Mid-60s	
MUSC 238	Rock Music Since the Mid-60s	
PHIL 101	Introduction to Western Philosophy	
PHIL 105	Critical Reasoning	
PHIL 211	Metaphysics: Philosophy of Reality	
PHIL 221	Epistemology: Philosophy of Knowledge	
PHIL 231	Aesthetics: Philosophy of Art	
PHIL 251	Ethics	
PHTO 110	Photography	
THTR 115	Theatrical Experience	
THTR 221 [WI]	Theatre History I	
THTR 222 [WI]	Theatre History II	

Social and Behaviorial Sciences

Select four of the following:		13.0
ANTH 110	Human Past: Anthropology and Prehistoric Archeology	
ANTH 210 [WI]	Worldview: Science, Religion and Magic	
COM 150	Mass Media and Society	
COM 230	Techniques of Speaking	
HIST 161	Themes in World Civilization I	
HIST 162	Themes in World Civilization II	
HIST 163	Themes in World Civilization III	
PSCI 100	Introduction to Political Science	
PSCI 120	History of Political Thought	
PSY 120	Developmental Psychology	
PSY 140	Approaches to Personality	
SOC 101	Introduction to Sociology	
SOC 115	Social Problems	

International Studies

Select two of the following:		6.0
ANTH 212 [WI]	Topics in World Ethnography	
ANTH 312	Approaches to Intercultural Behavior	
COM 360	International Communication	
COM 362	International Negotiations	
FMST 160	European Cinema	
HIST 235	The Great War, 1914-1918	
HIST 236	World War II	
HIST 259	History of Europe in the 20th Century	
HIST 270 [WI]	Introduction to Latin American History	
MUSC 331	World Musics	
PHIL 335	Global Ethical Issues	
SOC 340	Globalization	

Studies in Diversity

Select two of the following:		6.0
AFAS 101	Introduction to Africana Studies	
AFAS 201	Cross Currents in Africana Studies	
ANTH 101	Introduction to Cultural Diversity	
ANTH 210 [WI]	Worldview: Science, Religion and Magic	
COM 345	Intercultural Communication	
ENGL 345	American Ethnic Literature	
ENGL 350	Jewish Literature and Civilization	
ENGL 355 [WI]	Women and Literature	
ENGL 365	Topics in African American Literature	
HIST 212	Themes in African-American History	
HIST 214	United States Civil Rights Movement	
HIST 215	American Slavery	
HIST 216	Freedom in America	
HIST 218	Race and Film in United States History	
HIST 249	Modern Jewish History	
JUDA 201	Jewish Literature and Civilization	
JUDA 202	Jewish Life and Culture in the Middle Ages	
JUDA 203	Modern Jewish History	
MUSC 333	Afro-American Music USA	
SOC 210	Race, Ethnicity and Social Inequality	
SOC 330	Development and Underdevelopment in the Global South	
WGST 101	Introduction to Women's and Gender Studies	
WGST 240	Women and Society in a Global Context	

Major Requirements

Professional and Foundational Courses

English program requirements:		33.0
ENGL 195	English Freshman Seminar	
ENGL 205 [WI]	American Literature I	
ENGL 206 [WI]	American Literature II	
ENGL 211 [WI]	British Literature I	
ENGL 212	British Literature II	

	ENGL 315 [WI]	Shakespeare	
	ENGL 380	Literary Theory	
	ENGL 490	Seminar in English and American Literature	
	ENGL 492	Seminar in World Literature	
	ENGL 499	Senior Project in Literature	

Select three of the following:		9.0
ENGL 200 [WI]	Classical to Medieval Literature	
ENGL 201	Renaissance to the Enlightenment	
ENGL 202 [WI]	Romanticism to Modernism	
ENGL 203 [WI]	Survey of World Literature	
ENGL 204	Post-Colonial Literature	
ENGL 207 [WI]	African American Literature	
ENGL 214	Readings in Fiction	
ENGL 215 [WI]	Readings in Poetry	
ENGL 216 [WI]	Readings in Drama	

Select three of the following:		9.0
ENGL 310 [WI]	Period Studies	
ENGL 320 [WI]	Major Authors	
ENGL 325	Topics in World Literature	
ENGL 330	The Bible as Literature	
ENGL 335	Mythology	

Select three of the following:		9.0
ENGL 305 [WI]	The Mystery Story	
ENGL 306	Literature of Baseball	
ENGL 307	Literature of Genocide	
ENGL 323	Literature and Other Arts	
ENGL 345	American Ethnic Literature	
ENGL 350	Jewish Literature and Civilization	
ENGL 355 [WI]	Women and Literature	
ENGL 360 [WI]	Literature and Society	
ENGL 365	Topics in African American Literature	
ENGL 395 [WI]	Special Studies in Literature	
ENGL I399	Independent Study in ENGL	
PHIL 381 [WI]	Philosophy in Literature	

Creative and Professional Writing

Select five of the following		15.0
COM 160	Introduction to Journalism	
COM 310 [WI]	Technical Communication	
COM 315	Investigative Journalism	
COM 335	Digital Publishing	
COM 340	Desktop Publishing	
SCRP 270 [WI]	Screenwriting I	
SCRP 275 [WI]	Screenwriting II	
WRIT 210 [WI]	The Peer Reader in Context	
WRIT 220 [WI]	Creative Nonfiction Writing	
WRIT 225 [WI]	Creative Writing	
WRIT 301 [WI]	Writing Poetry	
WRIT 302 [WI]	Writing Fiction	
WRIT 303	Writing Humor and Comedy	
WRIT 306	Writing About the Media	
WRIT 310	Literary Editing & Publication	
WRIT 312 [WI]	Writing for Target Audiences	
WRIT 400 [WI]	Writing for -- and about -- the Web	
WRIT 405	Internship in Publishing	

Science and Technology in the Humanities

Select four of the following:		12.0
ENGL 300 [WI]	Literature & Science	
ENGL 302	Environmental Literature	
ENGL 303	Science Fiction	
ENGL 370	Topics in Literature and Medicine	

HIST 285	Technology in Historical Perspective	
HIST 287	History of Science: Ancient to Medieval	
HIST 289	History of Science: Enlightenment to Modernity	
HIST 292	Technology in American Life	
PHIL 311	Ethics and Information Technology	
PHIL 315	Engineering Ethics	
PHIL 341	Environmental Philosophy	
PHIL 351	Philosophy of Technology	
PHIL 355	Philosophy of Medicine	
PHIL 361	Philosophy of Science	
Electives		
Free Electives		27.0
Publishing Program Requirements		
LAW 603S	Media Law	3.0
MKTG 601	Marketing Strategy & Planning	3.0
PUB 504	Drexel Publishing Group Special Projects	3.0
PUB 530	The Publishing Environment	3.0
PUB 631	Publication Design: Print and Digital	3.0
PUB 635	Periodicals Publishing	3.0
PUB 720	The Ebook and Online Magazines	3.0
PUB 730	Book Publishing	3.0
PUB 750	Small Press Development	3.0
WEST 500	Introduction to Digital Design Tools	3.0
Select five of the following publishing electives		**15.0**
COM 500	Reading & Res Communication	
COM 510	Technical Writing	
COM 520	Science Writing	
COM 525	Document Design and Usability	
COM 530	Techniques and Science of Photography	
COM 540	Technical and Science Graphics	
COM 570	Technical, Science and Health Editing	
COM 575	Grant Writing	
COM 610	Theories of Communication and Persuasion	
COM 670	Medical Writing	
COM T680	Special Topics in Communication	
CCM 555	Ethnography of Communication	
LAW 602S	First Amendment	
LAW 760S	Copyright	
MGMT 601	Managing the Total Enterprise	
MKTG 630	Global Marketing	
ORGB 625	Leadership and Professional Development	
PUB I599	Independent Study in PUB	
PUB T680	Special Topics in Publishing	
PUB 701	Independent Project in Publishing	
Total Credits		230.0

*   Publishing electives must be 500-level or above.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENGL 195	English Freshman Seminar	3.0
UNIV H101	The Drexel Experience	1.0
Social and Behavioral Sciences course		4.0
Mathematics course		4.0
Foreign Language Course (1st consecutive course)		4.0
	Term Credits	19.0
Term 2		
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
Foreign Language Course (2nd consecutive course, 201-level)		4.0
Mathematics course		4.0
International Studies course		3.0
Free undergraduate elective		3.0
	Term Credits	17.0
Term 3		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
Natural Science course		3.0
Social and Behavioral Sciences course		3.0
Humanities and Fine Arts Course		3.0
International Studies course		3.0
Free undergraduate elective		3.0
	Term Credits	18.0
Term 4		
ENGL 205 [WI]	American Literature I	3.0
ENGL 211 [WI]	British Literature I	3.0
Social and Behavioral Science course		3.0
Natural Science course		3.0
Humanities and Fine Arts Course		3.0
	Term Credits	15.0
Term 5		
ENGL 206 [WI]	American Literature II	3.0
ENGL 212	British Literature II	3.0
Studies in Diversity course		3.0
Free undergraduate electives		6.0
	Term Credits	15.0
Term 6		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 202 [WI]	Romanticism to Modernism	3.0
ENGL 203 [WI]	Survey of World Literature	3.0
Creative and Professional Writing course		3.0
Social and Behavioral Sciences Course		3.0
Free undergraduate elective		3.0
	Term Credits	16.0
Term 7		
ENGL 216 [WI]	Readings in Drama	3.0
ENGL 315 [WI]	Shakespeare	3.0

PHIL 381 [WI]	Philosophy in Literature	3.0
Creative and Professional Writing courses		6.0
Humanities and Fine Arts Course		3.0
	Term Credits	18.0
Term 8		
PUB 530	The Publishing Environment	3.0
PUB 631	Publication Design: Print and Digital	3.0
PUB 635	Periodicals Publishing	3.0
MKTG 601	Marketing Strategy & Planning	3.0
Publishing elective		3.0
Free undergraduate elective		3.0
	Term Credits	18.0
Term 9		
ENGL 320 [WI]	Major Authors	3.0
ENGL 325	Topics in World Literature	3.0
ENGL 335	Mythology	3.0
ENGL 380	Literary Theory	3.0
ENGL 492	Seminar in World Literature	4.0
	Term Credits	16.0
Term 10		
ENGL 323	Literature and Other Arts	3.0
PUB 504	Drexel Publishing Group Special Projects	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Creative and Professional Writing course		3.0
Science and Technology in the Humanities course		3.0
Publishing elective		3.0
	Term Credits	16.0
Term 11		
ENGL 490	Seminar in English and American Literature	4.0
Science and Technology in the Humanities course		3.0
Studies in Diversity course		3.0
Publishing elective		3.0
Free undergraduate elective		3.0
	Term Credits	16.0
Term 12		
ENGL 499	Senior Project in Literature	4.0
Science and Technology in the Humanities course		3.0
Creative and Professional Writing course		3.0
Publishing electives		6.0
	Term Credits	16.0
Term 13		
ENGL 360 [WI]	Literature and Society	3.0
LAW 603S	Media Law	3.0
PUB 720	The Ebook and Online Magazines	3.0
Humanities and Fine Arts Course		3.0
Science and Technology in the Humanities course		3.0
Free undergraduate elective		3.0
	Term Credits	18.0
Term 14		
PUB 730	Book Publishing	3.0
PUB 750	Small Press Development	3.0
WEST 500	Introduction to Digital Design Tools	3.0
Free undergraduate elective		3.0
	Term Credits	12.0

Total Credit: 230.0

Global Studies BA / Public Health MPH

Major: Global Studies and Public health

Degrees Awarded: Bachelor of Arts (BA) AND Master of Public Health (MPH)
Calendar Type: Quarter
Total Credit Hours: 227.0
Co-op Options: One Co-op (Five Years)
Classification of Instructional Programs (CIP) code: 30.2001
Standard Occupational Classification (SOC) code: 19-3094

About the Program

To further prepare students for careers in the international sphere, Drexel University now offers an accelerated degree that allows students to complete an accelerated Bachelor's Degree (BA) in Global Studies and a Master's in Public Health (MPH). Students apply in their third year to Drexel's Dornsife School of Public Health; those accepted begin working on their MPH as they complete their BA, getting their MPH a year earlier than if they had done the two degrees separately. They also have a chance to complete an undergraduate co-op and gain valuable work experience as they go.

The Drexel BA degree prepares students for exciting international careers or at home working with diverse international populations. It prepares them by giving them foreign language fluency and offers a wide variety of courses in the social sciences, humanities, philosophy, hard sciences, cultural studies, and many other fields. While working on their Global Studies degree, students also are encouraged to study abroad, adding to their global perspective as well as perfecting their foreign language skills. There are also many opportunities for doing co-op abroad: a chance to live overseas for six months while gaining valuable work experience and getting a chance to truly be part of the culture of the place where they are working. Study abroad opportunities exist in many countries in Europe, Africa, Latin America, and across Asia; co-op abroad employers can also be found in almost any part of the world.

Added to this is the chance to get an accelerated degree in Public Health, a much-in-demand professional degree with many uses. Students interested in global public health, for example, can gain skills that make them attractive to international development agencies like the US Agency for International Development, the UN, or many international charitable organization. Students who want to work domestically can use their language and cultural skills in a wide variety of settings here, working with the diverse population within the US. A degree in public health allows people to make a real impact on society, improving the lives of people around the world.

Drexel Global Studies students have won a wide variety of international fellowships including Fulbright, Boren, and other US government programs. They have studied abroad in countries as diverse as France, Senegal, Equatorial Guinea, Argentina, Costa Rica, China, Japan, and Korea. They have gone on to work with the US State Department and other government agencies, with large Silicon Valley tech firms, and with private corporations around the world. Adding an MPH will open even more doors for students interested in really making a difference at home and abroad.

Additional Information

For more information, contact:

Rogelio Miñana, PhD
Department Head and Professor of Spanish
Department of Global Studies and Modern Languages
MacAlister Hall 3031
rogelio.minana@drexel.edu

Phone: 215.571.3194

Admission Requirements

Undergraduate admissions are determined by Enrollment Management/ Admissions (http://drexel.edu/admissions/overview/).

MPH requirements are set by the School of Public Health. Eligible students must:

- Be enrolled in the 4COP undergraduate program
- Maintain a minimum overall GPA of at least 3.25
- Be able to take undergraduate and graduate coursework during their senior year
- Complete the pre-requisite courses necessary for admission (determined by the School of Public Health) into the MPH program with no lower than a "C" grade
- Obtain one written recommendation from a faculty member and one from an advisor, supervisor or mentor
- Complete the online School of Public Health application to the MPH program at the Dornsife School of Public Health in their junior year
- Complete an interview with a Dornsife faculty member

Degree Requirements

BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
BIO 109	Biological Diversity, Ecology & Evolution	3.0
BIO 110	Biological Diversity, Ecology and Evolution Laboratory	1.0
CIVC 101	Introduction to Civic Engagement	1.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PBHL 101	Public Health 101	3.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Students must complete one of the following Chemistry sequences:		**8.0**
CHEM 111 & CHEM 112	General Chemistry I and General Chemistry II	
CHEM 101 & CHEM 112	General Chemistry I and General Chemistry II	
Students must select one of the following math sequences:		**12.0**
MATH 101 & MATH 102 & MATH 239	Introduction to Analysis I and Introduction to Analysis II and Mathematics for the Life Sciences	
MATH 121 & MATH 122 & MATH 123	Calculus I and Calculus II and Calculus III	
Global Studies Core Courses		
GST 101	Becoming Global: Language and Cultural Context	3.0
GST 102	Understanding Global: Markets and Governance	3.0
GST 359	Culture and Values	3.0
WGST 240	Women and Society in a Global Context	3.0
Two 200+ level GST courses		6.0
Language minor		**24.0**

Students must complete at least 24.0 credits above the 103-105 language level to earn a language minor.

Global Health and Sustainability Concentration Requirements		
ANTH 360	Culture and the Environment	3.0-4.0
or SOC 345	Sociology of the Environment	
PBHL 301	Epidemiology in Public Health	3.0
PBHL 303	Overview of Issues in Global Health	3.0
SOC 346	Environmental Justice	4.0
Choose one of the following ethics courses		**3.0**
PHIL 321	Biomedical Ethics	
PHIL 340	Environmental Ethics	
PBHL 309	Public Health Ethics	
Choose one of the following English courses		**3.0**
ENGL 300 [WI]	Literature & Science	
ENGL 302	Environmental Literature	
ENGL 370	Topics in Literature and Medicine	
Global Health and Sustainability Distribution Requirements		**30.0**
Students must complete 30.0 credits from the approved list:		
ANTH 210 [WI]	Worldview: Science, Religion and Magic	
ANTH 265	Health & Healing Practices in Cross-Cultural Perspective	
ANTH 310	Societies In Transition: The Impact of Modernization and the Third World	
ANTH 360	Culture and the Environment	
BIO 109	Biological Diversity, Ecology & Evolution	
BIO 264	Ethnobotany	
BIO 312	Genetically Modified Foods	
CJS 373	Environmental Crime	
COM 316	Campaigns for Health & Environment	
COM 317 [WI]	Environmental Communication	
COM 320 [WI]	Science Writing	
COM 375 [WI]	Grant Writing	
ECON 301	Microeconomics	
ECON 321	Macroeconomics	
ECON 351	Resource and Environmental Economics	
ENGL 300 [WI]	Literature & Science	
ENGL 302	Environmental Literature	
ENGL 370	Topics in Literature and Medicine	
ENSS 326	Cities and Sustainability	
ENSS 285	Introduction to Urban Planning	
ENTP 390	Energy Entrepreneurship	
ENVS 169	Environmental Science	
ENVS 247	Native Plants and Sustainability	
ENVS 275	Global Climate Change	
ENVS 289	Global Warming, Biodiversity and Your Future	
ENVS 328	Conservation Biology	
GST 320	Building Global Bridges	
GST 360	Civilizations	
GST 435	Model Organization of American States	
GST T280	Special Topics in Global Studies	
GST T380	Special Topics in Global Studies	
HIST 287	History of Science: Ancient to Medieval	
HIST 288	History of Science: Medieval to Enlightenment	
HIST 289	History of Science: Enlightenment to Modernity	
HIST 321	Themes in Global Environmental History	
HIST 322	Empire and Environment	
HIST 385	Transnational History of Science, Technology and Environment	
HSAD 312	Development of World Health Care	
HSAD 316	Health Care across Cultures	
NFS 345	Foods and Nutrition of World Cultures	
NFS 446	Perspectives in World Nutrition	
PBHL 302	Introduction to the History of Public Health	
PBHL 304	Introduction to Health & Human Rights	
PBHL 305	Women and Children: Health & Society	
PBHL 306	Introduction to Community Health	

PBHL 317	The World's Water	
PBHL 320	Exploring the HIV/AIDS Pandemic	
PBHL 321	Disease Outbreak Investigations	
PBHL 333	Health Inequality	
PHIL 321	Biomedical Ethics	
PHIL 335	Global Ethical Issues	
PHIL 340	Environmental Ethics	
PHIL 341	Environmental Philosophy	
PHIL 351	Philosophy of Technology	
PHIL 361	Philosophy of Science	
PSCI 305	Social Development: A Global Approach	
PSCI 334	Politics of Environment and Health	
PSCI 351	International Organizations: The United Nations	
PSCI 352	Ethics and International Relations	
PSCI 353	International Human Rights	
PSY 352	Psychology of Sustainability	
SOC 315	HIV/AIDS and Africa	
SOC 330	Development and Underdevelopment in the Global South	
SOC 340	Globalization	
WGST 275	Women's Health and Human Rights	
Free electives		29.0-28.0
Graduate Coursework		
PBHL 500	Practical Experience for the Master of Public Health	0.0
PBHL 510	Public Health Foundations and Systems I	4.0
PBHL 511	Public Health Foundations and Systems II	4.0
PBHL 512	Methods for Public Health Research I	4.0
PBHL 513	Methods for Public Health Research II	4.0
MPH Discipline Specific Foundation Courses		15.0
MPH Integrative Learning Experience *		4.0-6.0
CHP 750 & CHP 751	Integrative Learning Experience in Community Health & Prevention I and Integrative Learning Experience in Community Health & Prevention II	
EOH 750 & EOH 751	Integrative Learning Experience: Environmental and Occupational Health I and Integrative Learning Experience: Environmental and Occupational Health II	
EPI 750 & EPI 751	Integrative Learning Experience in Epidemiology I and Integrative Learning Experience in Epidemiology II	
HMP 750 & HMP 751	Integrative Learning Experience and Integrative Learning Experience II	
MPH Electives/Graduate Minor courses		21.0
Total Credits		227.0-229.0

*   The Integrated Learning Experience is determined based on the type of MPH chosen.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
GST 101	Becoming Global: Language and Cultural Context	3.0
MATH 101	Introduction to Analysis I	4.0
PBHL 101	Public Health 101	3.0
UNIV H101	The Drexel Experience	1.0
Language		4.0
	Term Credits	18.0
Term 2		
CHEM 111	General Chemistry I	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
GST 102	Understanding Global: Markets and Governance	3.0
MATH 102	Introduction to Analysis II	4.0
Language		4.0
	Term Credits	18.0
Term 3		
CHEM 112	General Chemistry II	4.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 239	Mathematics for the Life Sciences	4.0
Language		4.0
Free elective		3.0
	Term Credits	19.0
Term 4		
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
GST concentration requirement		3.0
GST distribution options		6.0
Language		4.0
	Term Credits	17.0
Term 5		
BIO 109	Biological Diversity, Ecology & Evolution	3.0
BIO 110	Biological Diversity, Ecology and Evolution Laboratory	1.0
WGST 240	Women and Society in a Global Context	3.0
GST concentration requirement		3.0
GST distribution option		3.0
Language		4.0
	Term Credits	17.0
Term 6		
ECON 201	Principles of Microeconomics	4.0
Language		4.0
GST 200+ level course		3.0
GST concentration requirement		3.0
Free elective		3.0
	Term Credits	17.0
Term 7		
ECON 202	Principles of Macroeconomics	4.0
Language		3.0
GST concentration requirement		3.0

GST distribution option		3.0
Free elective		3.0
	Term Credits	**16.0**
Term 8		
Language		3.0
GST distribution options		12.0
	Term Credits	**15.0**
Term 9		
Language		3.0
GST 200+ level course		3.0
GST concentration requirement		4.0
GST distribution options		6.0
Free elective		3.0
	Term Credits	**19.0**
Term 10		
PBHL 510	Public Health Foundations and Systems I	4.0
PBHL 512	Methods for Public Health Research I	4.0
MPH Discipline Specific Foundation course		3.0
GST concentration requirement		3.0
Free elective		3.0
	Term Credits	**17.0**
Term 11		
GST 359	Culture and Values	3.0
PBHL 511	Public Health Foundations and Systems II	4.0
PBHL 513	Methods for Public Health Research II	4.0
MPH Discipline Specific Foundation course		3.0
	Term Credits	**14.0**
Term 12		
MPH Discipline Specific Foundation course		3.0
MPH Electives/Graduate Minor courses		6.0
Free electives		6.0
	Term Credits	**15.0**
Term 13		
PBHL 500	Practical Experience for the Master of Public Health	0.0
MPH Integrative Learning Experience		2.0
PH Discipline specific course		3.0
PH Elective/Specialization courses		9.0
	Term Credits	**14.0**
Term 14		
MPH Integrated Learning Experience		2.0
Discipline specific course		3.0
Elective specialization courses		6.0
	Term Credits	**11.0**

Total Credit: 227.0

History BA / Science, Technology and Society MS

Major: History and Science, Technology and Society
Degrees Awarded: Bachelor of Arts (BA) and Master of Science in Science, Technology and Society (MS)
Calendar Type: Quarter
Total Credit Hours: 225.0
Co-op Options: One Co-op (Five years); Two Co-op (Five Years)
Classification of Instructional Programs (CIP) code: 54.0101
Standard Occupational Classification (SOC) code: 19-3093

About the Program

Drexel University permits undergraduate students in 5-year programs to apply for graduate programs while completing their undergraduate

programs, allowing students to complete their master's degrees in a shorter amount of time.

The accelerated degree program in History and Science, Technology and Society provides an opportunity to earn both a BA degree and an MS degree (two diplomas are awarded) in five years.

This program was created to meet the academic needs of History students who are interested in History, Technology and Science, and interested in pursuing careers in the rapidly growing field of STS.

Students entering the program must:

- have and maintain a minimum of 3.0 grade point average throughout the program
- have no fewer than 90.0 earned credits
- have no more than 120.0 registered credits
- complete only 2 co-ops if in a BA/MS program.

Additional Information

For more information about the accelerated BA/MS program, contact:

Jonathan Seitz, PhD
Assistant Department Head
Teaching Professor of History
jwseitz@drexel.edu

Sample Plan of Study

Recommended Plan of Study

Students should work closely with undergraduate advisor and the graduate Science, Technology & Society advisor to schedule an individualized plan of study for their accelerated degree completion.

The following is a sample plan of study.

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
HIST 101	Introductory Seminar in History I	4.0
UNIV H101	The Drexel Experience	1.0
Foreign language course (103-level or higher)		4.0
Non-US History Course[*]		4.0
	Term Credits	**16.0**
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
HIST 102	Introductory Seminar in History II	4.0
Foreign language course (201-level or higher)		3.0-4.0
Mathematics course		3.0-4.0
	Term Credits	**14.0-16.0**
Term 3		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
US History course[*]		4.0
Mathematics course		3.0-4.0
Free electives		6.0
	Term Credits	**16.0-17.0**
Term 4		
HIST 296	Research Methods in History I	4.0
History course covering pre-1700 history[**]		4.0

Science elective[***]		3.0-4.0
Social and behavioral science elective		3.0
Free elective		3.0
	Term Credits	17.0-18.0
Term 5		
History of Science, Technology, and Environment course[*]		4.0
Humanities/fine arts elective		3.0
Social and behavioral science elective		3.0
Science elective[***]		3.0-4.0
International studies elective		3.0
	Term Credits	16.0-17.0
Term 6		
Non-US History course[*]		4.0
Humanities/fine arts elective		3.0
Social and behavioral science elective		3.0
International studies elective		3.0
Diversity elective		3.0
	Term Credits	16.0
Term 7		
History electives[†]		8.0
Social and behavioral science elective		3.0
Humanities/fine arts elective		3.0
Diversity elective		3.0
	Term Credits	17.0
Term 8		
HIST 301	The Study of History	4.0
UNIV H201	Looking Forward: Academics and Careers	1.0
History elective[†]		4.0
Humanities/fine arts elective		3.0
SCTS 501	Introduction to Science, Technology and Society	3.0
	Term Credits	15.0
Term 9		
HIST 396	Research Methods in History II	4.0
HIST T380	Special Topics in History	4.0
Free elective		3.0
SCTS 502	Research Methods	3.0
SCTS Ethics, Values, Identities, & Cultures course		3.0
	Term Credits	17.0
Term 10		
HIST 490 [WI]	Senior Seminar I	4.0
Free elective		4.0
SCTS 503	Advanced Research Methods	3.0
SCTS Ethics, Values, Identities, & Cultures course		3.0
	Term Credits	14.0
Term 11		
HIST 491 [WI]	Senior Seminar II	4.0
History elective[†]		4.0
SCTS 504	Science, Technology & Society Theories	3.0
SCTS 798	Master's Research	3.0
	Term Credits	14.0
Term 12		
History electives[†]		8.0
Science, Technology & Society Lab		3.0
SCTS Science and Technology Policy course		3.0
SCTS elective		3.0
	Term Credits	17.0
Term 13		
History elective[†]		4.0
Free electives		9.0
SCTS electives		6.0
	Term Credits	19.0

Term 14		
Free electives		8.0
SCTS electives		9.0
	Term Credits	17.0

Total Credit: 225.0-230.0

*   Must be 200-level or above.

**   Must be 200-level or above. May not be HIST 201.

***   See catalog for BA-History degree requirements.

†   At least four core courses must be 200-level or above.

Students are strongly encouraged to take a course during each term while on co-op. Please refer to university policy for more information.

Co-op/Career Opportunities

Co-op Experiences

History majors have a wide variety of co-op experiences from which to choose. Business and public utilities offer many possibilities, and local, state, and federal governments; museums and archives; and law firms present many additional interesting co-op placements. Pre-law students, for example, are especially eager to see the inside of a law office, whether the co-op job they receive is clerical or a more challenging paralegal assignment. These practical experiences in the "real" world can reinforce the lessons of the classroom, sharpen skills, and establish important contacts. Sample co-op positions include:

- Law clerk/paralegal, Joe Davidson, Attorney-at-Law, Philadelphia
- Research analyst, Legislative Office for Research Liaison, Harrisburg, PA
- Legislative intern, Corporate Public Affairs Division, Philadelphia Electric Company
- Assistant lobbyist, Government Relations Office, Drexel University
- Education intern, Philadelphia Museum of Art
- Researcher, Philadelphia Chamber of Commerce
- Assistant, Office of the Governor, Harrisburg, PA

Career Opportunities

The flexible programs allow students to shape a curriculum that meets their needs, whether they are preparing for the business world, graduate school in history or political science, the MS in Science, Technology, and Society program (http://catalog.drexel.edu/graduate/collegeofartsandsciences/sciencetechnologyandsociety/), an MBA or other business program, or law school.

Accelerated BA in Philosophy and MS in Public Policy

Major: Philosophy and Public Policy
Degrees Awarded: Bachelor of Arts (BA) and Master of Science (MS)
Calendar Type: Quarter
Total Credit Hours: 225.0
Co-op Options: Three Co-op (Five years)
Classification of Instructional Programs (CIP) code: 44.0501
Standard Occupational Classification (SOC) code: 19-3094

About the Program

A degree in public policy will prepare you for a wide variety of careers in which you can make a difference in the world. Drexel's program is devoted to the idea that theory without practice is empty and practice without reflection is blind. Philosophy provides an excellent foundation for the skills involved in diagnosing social needs and responding to them by formulating and evaluating public policy. Our undergraduate Philosophy program is focused on the intersection of theory and practice and the development of reasoning, writing and critical skills. These skills give the student a solid foundation for graduate-level research and ultimately for careers in government, business, education, and social-scientific research.

Admission Requirements

Students who meet the standard eligibility requirement for accelerated programs should consult with their advisor and work on an individual plan of study to submit with the Change of Curriculum form.

Degree Requirements

College of Arts and Sciences Requirements - PHIL-BA

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 105	Critical Reasoning	3.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Two Studies in Diversity Electives		6.0
Two International Studies Electives		6.0
Two Mathematics Electives		6.0
Two Natural Science Electives		6.0
Four Social and Behavioral Science Electives		12.0
Select two of the following:		6.0
ARTH 101	History of Art I: Ancient to Medieval	
ARTH 102	History of Art II: Renaissance to Romanticism	
ARTH 103	History of Art III: Modern Art	

Language Requirement

Any two (2) consecutive foreign language courses (completing level 201)		8.0

Major Requirements - All Concentrations

COM 230	Techniques of Speaking	3.0
PHIL 101	Introduction to Western Philosophy	3.0
PHIL 211	Metaphysics: Philosophy of Reality	3.0
PHIL 212	Ancient Philosophy	3.0
PHIL 214	Modern Philosophy	3.0
PHIL 215	Contemporary Philosophy	3.0
PHIL 221	Epistemology: Philosophy of Knowledge	3.0
PHIL 251	Ethics	3.0
PHIL 421 [WI]	Seminar in Ancient Philosophy	3.0
PHIL 431 [WI]	Seminar in Modern Philosophy	3.0
PHIL 461 [WI]	Seminar in Contemporary Philosophy	3.0

Professional Ethics Elective

Select one of the following:		3.0
PHIL 301	Business Ethics	
PHIL 305	Ethics and the Media	
PHIL 315	Engineering Ethics	
PHIL 317	Ethics and Design Professions	
PHIL 321	Biomedical Ethics	
PHIL 322	Ethics of Human Enhancement	
PHIL 323	Organizational Ethics	
PHIL 325	Ethics in Sports Management	
PHIL 330	Criminal Justice Ethics	
PHIL 335	Global Ethical Issues	
PHIL 340	Environmental Ethics	

Thesis or Non-Thesis Option		**9.0**
Thesis Option:		
PHIL 497 [WI]	Senior Essay I: Research & Thesis Development	
PHIL 498 [WI]	Senior Essay II: Argument Construction	
PHIL 499 [WI]	Senior Essay III: Defense	
Non-Thesis Option:		
PHIL 481 [WI]	Seminar in a Philosophical School	
PHIL 485 [WI]	Seminar in a Major Philosopher	
Select one of the following:		
PHIL 341	Environmental Philosophy	
PHIL 351	Philosophy of Technology	
PHIL 355	Philosophy of Medicine	
PHIL 361	Philosophy of Science	
PHIL 381 [WI]	Philosophy in Literature	
PHIL 385	Philosophy of Law	
PHIL 391	Philosophy of Religion	
Electives		**51.0**
Free Electives		
Concentration Option [*]		**21.0**
General Philosophy Concentration:		
PHIL 111	Symbolic Logic I	
PHIL 231	Aesthetics: Philosophy of Art	
PHIL 481 [WI]	Seminar in a Philosophical School	
PHIL 485 [WI]	Seminar in a Major Philosopher	
Select one of the following:		
PHIL 207	Symbolic Logic II	
PHIL 301	Business Ethics	
PHIL 305	Ethics and the Media	
PHIL 311	Ethics and Information Technology	
PHIL 315	Engineering Ethics	
PHIL 317	Ethics and Design Professions	
PHIL 321	Biomedical Ethics	
PHIL 322	Ethics of Human Enhancement	
PHIL 323	Organizational Ethics	
PHIL 325	Ethics in Sports Management	
PHIL 330	Criminal Justice Ethics	
PHIL 335	Global Ethical Issues	
PHIL 340	Environmental Ethics	
Select two of the following:		
PHIL 341	Environmental Philosophy	
PHIL 351	Philosophy of Technology	
PHIL 355	Philosophy of Medicine	
PHIL 361	Philosophy of Science	
PHIL 381 [WI]	Philosophy in Literature	
PHIL 385	Philosophy of Law	
PHIL 391	Philosophy of Religion	

[*]   Philosophy students are encouraged to choose the General Philosophy Concentration to complete the accelerated program, but may also opt for concentrations in Ethical Theory and Practice, Philosophy and Law, or Philosophy, Technology and Science.

Public Policy Required Courses

REQUIRED COURSES

BUSN 502	Essentials of Economics	3.0
ECON 616	Public Finance and Cost Benefit Analysis	3.0
INFO 680	US Government Information	3.0
PLCY 503	Theory and Practice of Policy Analysis	3.0
PLCY 504	Methods of Policy Analysis	3.0
PLCY 506	Institutional Dynamics of the Policy Process	3.0
PLCY 507	Nonprofit Organizations	3.0
Choose one of the following statistics 2-course tracks		6.0
Track One:		
COM 705 & STAT 601	Data Analysis in Communication and Business Statistics	
OR Track Two:		
ECON 550 & STAT 610	Econometrics and Statistics for Business Analytics	

CASE STUDY COURSES

PLCY 510	Introduction to Case Study Research (FTF)	1.0
PLCY 511	Case Study Literature Review (ONL)	1.0
PLCY 512	Case Study Document Review (ONL)	1.0
PLCY 513	Case Study Interviews (ONL)	1.0
PLCY 515	Case Study Colloquium (FTF)	1.0
PLCY 516	Case Study Research II ((ONL-3 times))	3.0
PLCY 517	Case Study Final Project	1.0
ELECTIVE COURSES (Required and approved)		**9.0**
Total Credits		45.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
PHIL 101	Introduction to Western Philosophy	3.0
PHIL 105	Critical Reasoning	3.0
UNIV H101	The Drexel Experience	1.0
Math Elective		3.0
Diversity Elective		3.0
	Term Credits	16.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0

ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
PHIL 212	Ancient Philosophy	3.0
PHIL 111	Symbolic Logic I	3.0
Math Elective		3.0
Language Elective		4.0
	Term Credits	17.0
Term 3		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PHIL 207	Symbolic Logic II	3.0
PHIL 214	Modern Philosophy	3.0
Language Elective		4.0
Social Science Elective		4.0
	Term Credits	17.0
Term 4		
ARTH 101	History of Art I: Ancient to Medieval	3.0
PHIL 215	Contemporary Philosophy	3.0
PHIL 251	Ethics	3.0
Natural Science Elective		3.0
Professional Ethics Elective		3.0
Social Science Elective		3.0
	Term Credits	18.0
Term 5		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
COM 230	Techniques of Speaking	3.0
PHIL 211	Metaphysics: Philosophy of Reality	3.0
Social Science Elective		3.0
Natrual Science Elective		3.0
Diversity Elective		3.0
	Term Credits	18.0
Term 6		
PHIL 231	Aesthetics: Philosophy of Art	3.0
Philosophy Elective (PHIL 341-391)		3.0
Free Elective (UG)		3.0
PHIL 421 [WI]	Seminar in Ancient Philosophy	3.0
PHIL 481 [WI]	Seminar in a Philosophical School	3.0
International Studies Elective		3.0
	Term Credits	18.0
Term 7		
UNIV H201	Looking Forward: Academics and Careers	1.0
PHIL 431 [WI]	Seminar in Modern Philosophy	3.0
PHIL 485 [WI]	Seminar in a Major Philosopher	3.0
Philosophy Elective (PHIL 341-391)		3.0
Social Science Elective		3.0
Free Elective		3.0
	Term Credits	16.0
Term 8		
PHIL 497 [WI]	Senior Essay I: Research & Thesis Development	3.0
Free Elective (UG)		9.0
PLCY 504	Methods of Policy Analysis	3.0
PLCY 510	Introduction to Case Study Research	1.0
	Term Credits	16.0
Term 9		
PHIL 498 [WI]	Senior Essay II: Argument Construction	3.0
Free Electives (UG)		6.0
International Study Elective		3.0
PLCY 503	Theory and Practice of Policy Analysis	3.0
PLCY 511	Case Study Literature Review	1.0
	Term Credits	16.0
Term 10		

PHIL 221	Epistemology: Philosophy of Knowledge	3.0
PHIL 499 [WI]	Senior Essay III: Defense	3.0
Free Electives (UG)		6.0
BUSN 502	Essentials of Economics	3.0
PLCY 512	Case Study Document Review	1.0
	Term Credits	16.0
Term 11		
Free Electives (UG)		6.0
STAT 601	Business Statistics	3.0
Public Policy Required Elective		3.0
PLCY 513	Case Study Interviews	1.0
	Term Credits	13.0
Term 12		
PLCY 506	Institutional Dynamics of the Policy Process	3.0
ECON 616	Public Finance and Cost Benefit Analysis	3.0
PLCY 515	Case Study Colloquium	1.0
Public Policy Required Elective		3.0
Free Electives		6.0
	Term Credits	16.0
Term 13		
INFO 680	US Government Information	3.0
STAT 610	Statistics for Business Analytics	3.0
Free Electives (UG)		6.0
Case Study Research (x3)		3.0
	Term Credits	15.0
Term 14		
PLCY 507	Nonprofit Organizations	3.0
Public Policy Required Elective		3.0
PLCY 517	Case Study Final Project	1.0-3.0
Free Electives (UG)		6.0
	Term Credits	13.0-15.0

Total Credit: 225.0-227.0

Accelerated BA in Philosophy and MS in Science, Technology & Society

Major: Philosophy and Science, Technology & Society
Degrees Awarded: Bachelor of Arts (BA) and Master of Science (MS)
Calendar Type: Quarter
Total Credit Hours: 225.0
Classification of Instructional Programs (CIP) code: 30.1501
Standard Occupational Classification (SOC) code: 11-9121

About the Program

Drexel's Center for Science, Technology and Society (STS) brings together faculty and students who investigate the social dimensions of technology, medicine and science. Faculty in a range of fields — anthropology, criminal justice, history, information sciences, philosophy, political science, public health and sociology — conduct original research on the impact of new technologies, medical categories and scientific knowledge. They also investigate why some technologies or scientific knowledge are adopted while others are not. STS programs, also called science and technology studies, are growing in the US and worldwide. The ability to critically identify the values and incentives built into scientific knowledge and technology design and use is highly valued in settings such as health care organizations, government agencies, public policy realms, tech industries and more.

Philosophy is an excellent foundation for the kind of work STSers do, and the kind of careers they pursue. Philosophical study practices and develops aptitudes associated with careful, critical analysis and integrative, creative thought. Philosophy students develop the skills of careful reading, effective, clear writing, and thoughtful, logical argument.

This accelerated-degree program provides an opportunity to simultaneously earn a Philosophy BA degree and an STS MS degree (two diplomas are awarded) in just five years. Students can complete the MS degree solely through coursework or combine coursework with a master's project or a master's thesis. The flexibility offered by the STS curriculum, the opportunity to work closely alongside research-active faculty, and the training offered in multiple theoretical and research methodologies opens the door to a wide range of career opportunities. Students in the accelerated program have the opportunity to craft their own original research project with guidance from some of the most interesting and dynamic faculty scholars in their fields. The STS Lab course is a unique feature of the curriculum--it prepares students to work as a team to address meaningful science and technology related topics. Working with a faculty adviser, graduate students develop an individualized plan of study that allows them to pursue their interests in depth.

Admission Requirements

Depending on the academic program, eligible students can be admitted to an accelerated degree program in one of two ways: as an incoming freshman or after completing a minimum of 90 credits but no more than 120 credits.

To learn more about eligibility and enrollment requirements, visit the Undergraduate Admissions (http://drexel.edu/undergrad/academics/accelerated-degrees/) web page.

Degree Requirements

College of Arts and Sciences Requirements - PHIL-BA

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 105	Critical Reasoning	3.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Two Studies in Diversity Electives		6.0
Two International Studies Electives		6.0
Two Mathematics Electives		6.0
Two Natural Science Electives		6.0
Four Social and Behavioral Science Electives		12.0
Select two of the following:		6.0
ARTH 101	History of Art I: Ancient to Medieval	
ARTH 102	History of Art II: Renaissance to Romanticism	
ARTH 103	History of Art III: Modern Art	
Language Requirement		
Any two (2) consecutive foreign language courses (completing level 201)		8.0
Major Requirements - All Concentrations		
COM 230	Techniques of Speaking	3.0
PHIL 101	Introduction to Western Philosophy	3.0
PHIL 211	Metaphysics: Philosophy of Reality	3.0
PHIL 212	Ancient Philosophy	3.0

PHIL 214	Modern Philosophy	3.0
PHIL 215	Contemporary Philosophy	3.0
PHIL 221	Epistemology: Philosophy of Knowledge	3.0
PHIL 251	Ethics	3.0
PHIL 421 [WI]	Seminar in Ancient Philosophy	3.0
PHIL 431 [WI]	Seminar in Modern Philosophy	3.0
PHIL 461 [WI]	Seminar in Contemporary Philosophy	3.0

Professional Ethics Elective

Select one of the following:		3.0
PHIL 301	Business Ethics	
PHIL 305	Ethics and the Media	
PHIL 315	Engineering Ethics	
PHIL 317	Ethics and Design Professions	
PHIL 321	Biomedical Ethics	
PHIL 322	Ethics of Human Enhancement	
PHIL 323	Organizational Ethics	
PHIL 325	Ethics in Sports Management	
PHIL 330	Criminal Justice Ethics	
PHIL 335	Global Ethical Issues	
PHIL 340	Environmental Ethics	

Thesis or Non-Thesis Option   **9.0**

Thesis Option:

PHIL 497 [WI]	Senior Essay I: Research & Thesis Development
PHIL 498 [WI]	Senior Essay II: Argument Construction
PHIL 499 [WI]	Senior Essay III: Defense

Non-Thesis Option:

PHIL 481 [WI]	Seminar in a Philosophical School
PHIL 485 [WI]	Seminar in a Major Philosopher

Select one of the following:

PHIL 341	Environmental Philosophy
PHIL 351	Philosophy of Technology
PHIL 355	Philosophy of Medicine
PHIL 361	Philosophy of Science
PHIL 381 [WI]	Philosophy in Literature
PHIL 385	Philosophy of Law
PHIL 391	Philosophy of Religion

Electives   **51.0**

Free Electives

Concentration Option *   **21.0**

General Philosophy Concentration:

PHIL 111	Symbolic Logic I
PHIL 231	Aesthetics: Philosophy of Art
PHIL 481 [WI]	Seminar in a Philosophical School
PHIL 485 [WI]	Seminar in a Major Philosopher

Select one of the following:

PHIL 207	Symbolic Logic II
PHIL 301	Business Ethics
PHIL 305	Ethics and the Media
PHIL 311	Ethics and Information Technology
PHIL 315	Engineering Ethics
PHIL 317	Ethics and Design Professions
PHIL 321	Biomedical Ethics
PHIL 322	Ethics of Human Enhancement
PHIL 323	Organizational Ethics
PHIL 325	Ethics in Sports Management
PHIL 330	Criminal Justice Ethics
PHIL 335	Global Ethical Issues
PHIL 340	Environmental Ethics

Select two of the following:

PHIL 341	Environmental Philosophy
PHIL 351	Philosophy of Technology
PHIL 355	Philosophy of Medicine

PHIL 361	Philosophy of Science	
PHIL 381 [WI]	Philosophy in Literature	
PHIL 385	Philosophy of Law	
PHIL 391	Philosophy of Religion	
Total Credits		**182.0**

*   Philosophy students are encouraged to choose the General Philosophy Concentration to complete the accelerated program, but may also opt for concentrations in Ethical Theory and Practice, Philosophy and Law, or Philosophy, Technology and Science.

STS Required Courses:

BASIC REQUIREMENTS

SCTS 501	Introduction to Science, Technology and Society	3.0
SCTS 502	Research Methods	3.0
SCTS 503	Advanced Research Methods	3.0
SCTS 504	Science, Technology & Society Theories	3.0

ADVANCED REQUIREMENTS

Ethics, Values, Identities, and Culture		6.0
Select two of the following:		
CHP 807	Public Health Ethics	
INFO 679	Information Ethics	
SCTS 575	Digital Power and Resistance	
SCTS 600	Contemporary Feminist Theory	
SCTS 610	Material Culture	
SCTS 612	Medical and Healthcare Ethics	
SCTS 614	Technology, Progress, and Determinism	
SCTS 615	The Biopolitics of Health	
SCTS 620	Medicine, Technology and Science	
SCTS 650	Global Subjects of Biocapital	
SCTS 651	Transnational Science, Technology & Capitalism	

Science and Technology Policy		3.0
Select one of the following:		
COM 650	Telecommunications Regulation and Policy	
INFO 725	Information Policy and Ethics	
PLCY 509	Sustainability & Public Policy	
SCTS 570	Environmental Policy	
SCTS 571	Science and Technology Policy	
SCTS 641	Risk and Disaster Policy	
SCTS 643	Contemporary Stem Workforces:Organizations of Labor in Lab, Shop and Clinic	
SCTS 645	War and Technoscience	

Science, Technology & Society Lab		3.0
Select one of the following:		
SCTS 550	Special Topics in STS Lab	
SCTS 561	Mobilities Lab	
SCTS 562	Identity and Intersectionality Lab	
SCTS 563	Philadelphia in a Changing Climate Lab	

Thesis/Project and Electives *		**21.0**
SCTS 798	Master's Research	

Suggested Electives **

CCM 701	Contemporary Social Theory
CCM 704	Research Methods in Communication, Culture and Media
CCM 801	Seminar in Contemporary Theory
CHP 516	History of Public Health
COM 650	Telecommunications Regulation and Policy
MGMT 602	Innovation Management
PLCY 504	Methods of Policy Analysis
PSY 612	Psychology of Human-Computer Interaction Design
PSY 712	History and Systems
SCTS 584	Historiography of Science

SCTS 639	Politics of Life	
SCTS 640	STS Perspectives on Risk and Disaster	
SCTS 660	Theoretical and Sociological Aspects of Measurement	
SCTS 665	Advanced Topics in Philosophy of Science	
SCTS 697	Internship in Science, Technology and Society	
SCTS T780	Special Topics in Science Technology and Society	
SCTS I799	Independent Study in SCTS	
Total Credits		45.0

*   Students who elect to pursue the Thesis option should complete 9.0 credits of SCTS 798 - Master's Thesis and select 12.0 credits from the list of suggested electives.

**   Additional electives may be taken from other schools and colleges in the University with approval from the Director of the MS in Science, Technology & Society program.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
PHIL 101	Introduction to Western Philosophy	3.0
PHIL 105	Critical Reasoning	3.0
UNIV H101	The Drexel Experience	1.0
Math Elective		3.0
	Term Credits	13.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
PHIL 212	Ancient Philosophy	3.0
Language Elective		4.0
Math Elective		3.0
	Term Credits	14.0
Term 3		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PHIL 214	Modern Philosophy (Natural Science Elective)	3.0

Language Elective		4.0
Natural Science Elective		3.0
Social Science Elective		3.0
	Term Credits	16.0
Term 4		
ARTH 101	History of Art I: Ancient to Medieval	3.0
PHIL 215	Contemporary Philosophy	3.0
PHIL 251	Ethics	3.0
Diversity Elective		3.0
Social Science Elective		3.0
	Term Credits	15.0
Term 5		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
COM 230	Techniques of Speaking	3.0
PHIL 111	Symbolic Logic I	3.0
PHIL 211	Metaphysics: Philosophy of Reality	3.0
Diversity Elective		3.0
Natural Science Elective		3.0
	Term Credits	18.0
Term 6		
PHIL 207	Symbolic Logic II	3.0
PHIL 231	Aesthetics: Philosophy of Art	3.0
PHIL 421 [WI]	Seminar in Ancient Philosophy	3.0
PHIL 481 [WI]	Seminar in a Philosophical School	3.0
Philosophy Elective (PHIL 341 - PHIL 391)		3.0
International Studies Elective		3.0
	Term Credits	18.0
Term 7		
PHIL 431 [WI]	Seminar in Modern Philosophy	3.0
PHIL 485 [WI]	Seminar in a Major Philosopher	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Philosophy Elective (PHIL 341 - PHIL 391)		3.0
Professional Ethics Elective		3.0
Social Science Elective		3.0
	Term Credits	16.0
Term 8		
PHIL 497 [WI]	Senior Essay I: Research & Thesis Development	3.0
SCTS 501	Introduction to Science, Technology and Society	3.0
Free Electives		6.0
Sociology or Political Science Elective		4.0
	Term Credits	16.0
Term 9		
PHIL 498 [WI]	Senior Essay II: Argument Construction	3.0
SCTS 502	Research Methods	3.0
International Studies Elective		3.0
Free Electives (UG)		9.0
	Term Credits	18.0
Term 10		
PHIL 221	Epistemology: Philosophy of Knowledge	3.0
PHIL 499 [WI]	Senior Essay III: Defense	3.0
SCTS 503	Advanced Research Methods	3.0
Free Electives		9.0
	Term Credits	18.0
Term 11		
SCTS 504	Science, Technology & Society Theories	3.0
SCTS 600	Contemporary Feminist Theory	3.0
SCTS 645	War and Technoscience	3.0
Free Electives (UG)		9.0
	Term Credits	18.0
Term 12		
SCTS 570	Environmental Policy	3.0

SCTS 639	Politics of Life	3.0
STS Elective		3.0
Free Electives (UG)		6.0
	Term Credits	15.0
Term 13		
SCTS 571	Science and Technology Policy	3.0
SCTS 665	Advanced Topics in Philosophy of Science	3.0
STS Elective		3.0
Free Electives (UG)		6.0
	Term Credits	15.0
Term 14		
SCTS 612	Medical and Healthcare Ethics	3.0
SCTS 798	Master's Research	3.0
SCTS I799	Independent Study in SCTS	3.0
Free Electives (UG)		6.0
	Term Credits	15.0

Total Credit: 225.0

Political Science BA / Science, Technology & Society MS

Major: Accelerated BA in Political Science and MS in Science, Technology & Society
Degrees Awarded: Bachelor of Arts (BA) & Master of Science (MS
Calendar Type: Quarter
Total Credit Hours: 225.0
Co-op Options: One Co-op
Classification of Instructional Programs (CIP) code: 45.1001
Standard Occupational Classification (SOC) code: 19-3094

About the Program

Drexel University permits undergraduate students to apply for graduate programs while completing their undergraduate programs, allowing students to complete their master's degrees in a shorter amount of time.

The accelerated-degree program provides an opportunity to simultaneously earn both a BA degree in Political Science and an MS degree in Science, Technology & Society (http://catalog.drexel.edu/graduate/collegeofartsandsciences/sciencetechnologyandsociety/) (two diplomas are awarded) in five years.

Students entering the program must:

- have and maintain a minimum of 3.0 grade point average throughout the program
- have no fewer than 90.0 earned credits
- have no more than 120.0 registered credits

The Department of Politics would especially like to encourage its own majors to consider the accelerated degree program in Science, Technology & Society. If you are currently enrolled in a 4+1 (4COP Accelerated Program) degree program, you are required to fill out the Accelerated Degree Level Conversion Form. After obtaining all the required signatures, please direct the form to the Assistant Director for Graduate Studies Office, Randell 240.

For more information about the accelerated BA/MS program, contact:
STS Program Director
Macalister Hall, 3025
215.895.2463

Sample Plan of Study

225.0 minimum credits

Term 1		Credits
UNIV H101	The Drexel Experience	1.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
PSCI 110	American Government	4.0
PSCI 150	International Politics	4.0
Foreign language course		4.0
	Term Credits	16.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
PSCI 120	History of Political Thought	4.0
PSCI 131 [WI]	Research Design for Political Science	4.0
Foreign language course		4.0
	Term Credits	16.0
Term 3		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PSCI 140	Comparative Politics I	4.0
Foreign language course (must complete through level 201)		3.0
Diversity Studies elective		3.0
Social Science elective		3.0
	Term Credits	16.0
Term 4		
PSCI 232	Quantitative Research Methods in Political Science	4.0
Choose one PSCI intermediate course		4.0
Mathematics course		3.0
Diversity Studies elective		3.0
Free elective		3.0
	Term Credits	17.0
Term 5		
PSCI 231	Qualitative and Mixed-Methods Research in Political Science	4.0
Choose one PSCI intermediate course		4.0
Social science elective		3.0
Mathematics course		3.0
Free elective		3.0
	Term Credits	17.0
Term 6		
Choose one PSCI intermediate course		4.0
Political Science elective		4.0
Science course		3.0
Humanities/fine arts elective		3.0
Free elective		3.0
	Term Credits	17.0
Term 7		
Political Science elective		4.0
Science course		3.0
Free electives		6.0
	Term Credits	13.0
Term 8		
Choose one PSCI intermediate course		4.0
Political Science elective		4.0
Humanities/fine arts elective		3.0
Social science elective		3.0
SCTS 501	Introduction to Science, Technology and Society	3.0
	Term Credits	17.0

Term 9

SCTS 502	Research Methods	3.0
SCTS Ethics Values, Identities, & Culture course		3.0
Social science elective		3.0
Political Science elective		4.0
Humanities/fine arts elective		3.0
Science course		3.0
	Term Credits	19.0

Term 10

UNIV H201	Looking Forward: Academics and Careers	1.0
SCTS 503	Advanced Research Methods	3.0
SCTS Ethics Values, Identities, & Culture course		3.0
Political Science elective		4.0
Social Science elective		3.0
Humanities/fine arts elective		3.0
	Term Credits	17.0

Term 11

SCTS 504	Science, Technology & Society Theories	3.0
SCTS graduate elective		3.0
International studies elective		3.0
Free elective		3.0
	Term Credits	12.0

Term 12

Political Science elective		4.0
International studies elective		3.0
SCTS Science and Technology Policy course		3.0
Science, Technology, & Society Lab		3.0
SCTS elective		3.0
	Term Credits	16.0

Term 13

Political Science electives		8.0
Free elective		3.0
SCTS Electives		6.0
	Term Credits	17.0

Term 14

Free Electives		6.0
SCTS electives		9.0
	Term Credits	15.0

Total Credit: 225.0

Accelerated BA in Sociology and MS in Science, Technology & Society

Major: Sociology and Science, Technology & Society
Degrees Awarded: Bachelor of Arts (BA) and Master of Science (MS)
Calendar Type: Quarter
Total Credit Hours: 225.0
Co-op Options: Three Co-op (Five years)
Classification of Instructional Programs (CIP) code: 31.1501
Standard Occupational Classification (SOC) code: 11-9121

About the Program

The accelerated-degree program provides an opportunity to simultaneously earn both a BA degree and an MS degree (two diplomas are awarded) in the time normally required to finish a bachelor's degree alone. The accelerated program provides students with a strong training in sociology and in the interdisciplinary field of Science, Technology and Society (STS).

The sociology major at Drexel University has three components: theory, methods, substantive coursework and features specialized coursework relating to social justice issues.

Sociology is the systematic study of societies. Society is the sum total of individual and group interaction and relations, from small groups and families to global networks and complex social organizations. The discipline covers a wide variety of fields of inquiry. Sociologists examine structural relations—how human society is organized from small groups to large institutions—and is committed to developing a *critical understanding* of these relationships. Thus the sociology major stresses theory, research methods, quantitative and qualitative data analysis as applied to a wide variety of substantive areas including but not limited to social inequality, political power, gender, class, race, ethnicity, family, crime, technology and environmental change as well as a wide variety of social and political movements connected with social change. The stress on *critical understanding* means that sociology majors will strive not only to develop strong analytic abilities but an intellectual and ethical engagement reflected in sociologically informed thinking and action. The research and analytical skills developed in our program are sought after by a wide variety of professions.

Specialized social justice coursework is typically carried out in connection with community groups and organizations. It is a way the Sociology Program and Drexel University as a whole seeks to become practically engaged with the wider community while promoting social justice.

The Science, Technology, and Society (STS) program systemically investigates the social dimensions of science, technology and medicine. Faculty from a range of disciplines contribute to a curriculum that features a broad set of perspectives, all grounded in a foundation of critical thinking, research methods, and writing and presentation skills. The STS program emphasizes three interrelated areas: environment and sustainability; health and medicine; and information, identities and networks. The STS Lab course is a unique feature of the curriculum—it prepares students to work as a team to address meaningful science and technology related topics. Working with a faculty adviser, graduate students develop an individualized plan of study that allows them to pursue their interests in depth.

STS students are independent thinkers who are dedicated to understanding the intersections of society, science, medicine and technology. While STS students vary in their professional and educational backgrounds and career ambitions, they share a common commitment to a critical approach to our world's most pressing technoscientific challenges.

Prospective students for the MS in STS see this educational opportunity as a crucial factor in their skill development and career advancement. They are recent college graduates in the social sciences, humanities, natural sciences, and engineering; middle and high school teachers; and professionals in businesses, city and state government offices, and area hospitals. Students can attend full time or part time and complete all coursework in the evening.

Degree Requirements

General Requirements

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	

ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Four Humanities/Fine Arts Courses		12.0
Two Mathematics Courses		6.0
Two Science Courses		6.0
Two Consecutive Foreign Language Courses		8.0
Social and Behavioral Sciences		**12.0**
SOC 101	Introduction to Sociology	
Social and Behavioral Sciences Electives (9 credits)		
International Studies		**6.0**
Two International Studies Courses		
Studies in Diversity		**6.0**
Two Studies in Diversity Courses		
Sociology Core Requirements		
Required Major Capstone		
SOC 450	Capstone in Sociology	4.0
Theory Sequence		**8.0**
SOC 355 [WI]	Classical Social Theory	
SOC 356 [WI]	Contemporary Social Theory	
Methods Sequence		**16.0**
SOC 250	Research Design: Qualitative Methods	
SOC 350	Research Methods II	
SOC 364	Computer-Assisted Data Analysis	
SOC 365	Computer-Assisted Data Analysis II	
Required Sociology Electives		
Select at least 12 of the following: (At least 4 must be at the 300-level or 400-level; and at least 1 must be at the 400-level)		48.0
SOC 115	Social Problems	
SOC 210	Race, Ethnicity and Social Inequality	
SOC 215	Sociology of Work	
SOC 220	Wealth and Power	
SOC 221	Sociology of the Family	
SOC 222	Sex and Society	
SOC 230	Gender and Society	
SOC 235	Sociology of Health and Illness	
SOC 240	Urban Sociology	
SOC 245	Sociology of the Future	
SOC 268	Sociology of Sport	
SOC 270	Theory of Applied and Community Sociology	
SOC 271	Sociology of Aging	
SOC 276	Global Climate Change	
SOC 313	Sociology of Global Health	
SOC 315	HIV/AIDS and Africa	
SOC 320	Sociology of Deviance	
SOC 330	Development and Underdevelopment in the Global South	
SOC 340	Globalization	
SOC 341	Environmental Movements in America	
SOC 345	Sociology of the Environment	
SOC 346	Environmental Justice	
SOC 349	Sociology of Disasters	
SOC 370	Practicum in Applied and Community Sociology	
SOC T380	Special Topics in SOC	
SOC 410	Imagining Multiple Democracies	
SOC 420	Love, Rage & Debt: The Debt Society	
SOC 430	Politics of Life	
SOC 444	Social Movements	
SOC T480	Special Topics in Sociology	
SOC 490	Sociology Research Seminar I: Research Design	
SOC 491	Sociology Research Seminar II: Data Acquisition and Analysis	
SOC 492	Sociology Research Seminar III: Practicum in Sociological Research	
SOC I499	Independent Study in SOC	
Free Electives		**36.0**
Total Credits		180.0

*At least one foreign language course must be at the 200-level. In addition, the department recommends students take 2 additional foreign language courses as free electives.

Basic Requirements		
SCTS 501	Introduction to Science, Technology and Society	3.0
SCTS 502	Research Methods	3.0
SCTS 503	Advanced Research Methods	3.0
SCTS 504	Science, Technology & Society Theories	3.0
Advanced Requirements		
Ethics, Values, Identities, and Culture		6.0
Select two of the following:		
CHP 807	Public Health Ethics	
INFO 679	Information Ethics	
SCTS 600	Contemporary Feminist Theory	
SCTS 610	Material Culture	
SCTS 612	Medical and Healthcare Ethics	
SCTS 614	Technology, Progress, and Determinism	
SCTS 615	The Biopolitics of Health	
SCTS 620	Medicine, Technology and Science	
SCTS 650	Global Subjects of Biocapital	
SCTS 651	Transnational Science, Technology & Capitalism	
Science and Technology Policy		3.0
Select one of the following:		
COM 650	Telecommunications Regulation and Policy	
INFO 725	Information Policy and Ethics	
PLCY 509	Sustainability & Public Policy	
SCTS 570	Environmental Policy	
SCTS 571	Science and Technology Policy	
SCTS 641	Risk and Disaster Policy	
SCTS 643	Contemporary Stem Workforces:Organizations of Labor in Lab, Shop and Clinic	
SCTS 645	War and Technoscience	
Science, Technology & Society Lab		3.0
Select one of the following		
SCTS 550	Special Topics in STS Lab	
SCTS 561	Mobilities Lab	
SCTS 562	Identity and Intersectionality Lab	
Thesis/Project and Electives *		**21.0**
SCTS 798	Master's Research	
Suggested Electives **		
CHP 516	History of Public Health	
MGMT 602	Innovation Management	
PLCY 510	Introduction to Case Study Research	
PSY 612	Psychology of Human-Computer Interaction Design	
PSY 712	History and Systems	
SCTS 584	Historiography of Science	
SCTS 639	Politics of Life	
SCTS 640	STS Perspectives on Risk and Disaster	
SCTS 660	Theoretical and Sociological Aspects of Measurement	
SCTS 665	Advanced Topics in Philosophy of Science	
SCTS 697	Internship in Science, Technology and Society	
SCTS T780	Special Topics in Science Technology and Society	
SCTS I799	Independent Study in SCTS	
Total Credits		45.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
SOC 101	Introduction to Sociology	3.0
UNIV H101	The Drexel Experience	1.0
Foreign Language course		4.0
Math Elective		3.0
	Term Credits	14.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
Social and Behavioral Sciences Course		3.0
Sociology Elective		4.0
Foreign Language Elective		4.0
International Studies Course		3.0
	Term Credits	18.0
Term 3		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
SOC 355 [WI]	Classical Social Theory	4.0
Foreign Language Elective		4.0
International Studies Elective		3.0
Science Elective		3.0
	Term Credits	17.0
Term 4		
SOC 250	Research Design: Qualitative Methods	4.0
SOC 115	Social Problems	4.0
SOC 210	Race, Ethnicity and Social Inequality	4.0
Humanities/Fine Arts Course		3.0
	Term Credits	15.0
Term 5		
SOC 230	Gender and Society	4.0
SOC 268	Sociology of Sport	4.0
SOC 356 [WI]	Contemporary Social Theory	4.0

Diversity Elective		3.0
	Term Credits	15.0
Term 6		
SOC 364	Computer-Assisted Data Analysis	
SOC 240	Urban Sociology	4.0
Social and Behavioral Science Elective		3.0
Science Elective		3.0
Diversity Elective		3.0
	Term Credits	13.0
Term 7		
SOC 276	Global Climate Change	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Humanities/Fine Arts Elective		3.0
Sociology Electives		7.0
Free Elective		3.0
	Term Credits	17.0
Term 8		
SOC 350	Research Methods II	4.0
SOC 346	Environmental Justice	4.0
SCTS 501	Introduction to Science, Technology and Society	3.0
Free Elective		3.0
Sociology Elective		4.0
	Term Credits	18.0
Term 9		
SCTS 502	Research Methods	3.0
SOC 349	Sociology of Disasters	4.0
SOC 450	Capstone in Sociology	4.0
Free Elective		3.0
Science Course		3.0
	Term Credits	17.0
Term 10		
SCTS 503	Advanced Research Methods	3.0
SOC 365	Computer-Assisted Data Analysis II	4.0
SOC 370	Practicum in Applied and Community Sociology	4.0
Free Electives (UG)		3.0
Humanities/Fine Arts Course		3.0
	Term Credits	17.0
Term 11		
SCTS 504	Science, Technology & Society Theories	3.0
SCTS 645	War and Technoscience	3.0
SCTS 600	Contemporary Feminist Theory	3.0
Free Elective (UG)		6.0
	Term Credits	15.0
Term 12		
SCTS 570	Environmental Policy	3.0
SCTS 639	Politics of Life	3.0
Free Elective (UG)		6.0
STS Elective		3.0
	Term Credits	15.0
Term 13		
SCTS 571	Science and Technology Policy	3.0
SCTS 665	Advanced Topics in Philosophy of Science	3.0
STS Elective		3.0
Free Elective		6.0
	Term Credits	15.0
Term 14		
SCTS 612	Medical and Healthcare Ethics	3.0
SCTS 798	Master's Research	3.0
SCTS 799	Independent Study in Science, Technology and Society	3.0

| Free Electives (UG) | 6.0 |
| Term Credits | 15.0 |

Total Credit: 221.0

Science, Technology and Society Faculty

Lloyd Ackert, PhD *(Johns Hopkins University)*. Teaching Professor. History of science and technology; ecology; Russian science.

Peter Amato, PhD *(Fordham University) Director, Philosophy*. Teaching Professor. Ethics, Marxism, Continental philosophy.

Jesse Ballenger, PhD *(Case Western Reserve University)*. Associate Teaching Professor. Healthcare, medicine and ethics; aging and neurodegenerative diseases; Science and Technology Studies.

Mary Ebeling, PhD *(University of Surrey) Director, Women's and Gender Studies*. Associate Professor. Science and technology studies; emerging technologies and biocapital; media and democratic cultures; radical social movements; sociology of markets; political sociology; and ethnographic methodologies.

Christian Hunold, PhD *(University of Pittsburgh)*. Professor. Environmental policy; comparative politics; urban wildlife; political theory.

Kelly Joyce, PhD *(Boston College) Director, Master's Program in Science Technology & Society*. Professor. Science, medicine and technology; aging and technology; qualitative social science methods; healthcare and medicine.

Alison Kenner, PhD *(Rensselaer Polytechnic Institute)*. Associate Professor. Science, technology, and health; environmental health problems; cities and place; feminist theory; medical anthropology; digital humanities

Scott G. Knowles, PhD *(Johns Hopkins University) Department Head, History*. Professor. Urban history, Philadelphia history, history of technology, history of disasters, modern history.

Brent Luvaas, PhD *(UCLA)*. Associate Professor. DIY and independent media production; transnational consumer culture; popular music; new media and mediated subjectivities; youth culture in the US and Indonesia.

Jonson Miller, PhD *(Virginia Tech)*. Teaching Professor. Science and technology, American history, military history.

Gwen Ottinger, PhD *(University of California, Berkeley)*. Associate Professor. Social studies of science and technology, environmental justice, science and engineering ethics, citizen science, environmental ethics.

Flavia Padovani, PhD *(University of Geneva)*. Associate Professor. History and philosophy of science, epistemology, logic.

Jody A. Roberts, PhD *(Virginia Polytechnic Institute and State University) Director, Center for Contemporary History and Policy, Chemical Heritage Foundation*. Assistant Professor. Intersections of emerging molecular sciences and public policy and the ways in which tensions brought about between the two get resolved.

Tiago Saraiva, PhD *(Universidad Autónoma de Madrid)*. Associate Professor. History of science and technology; transnational history; environmental history

Jonathan Seitz, PhD *(University of Wisconsin) Assistant Department Head, History*. Teaching Professor. History of religion, science, medicine, witchcraft, early modern Europe, Italy.

Mimi Sheller, PhD *(New School for Social Research) Director, Center for Mobilities Research and Policy*. Professor. Sustainable mobility and mobility justice: new cultures and infrastructures of travel, transport, mobile communication, and urbanism; Caribbean Studies: history, culture and political theory of the region, including intersections of race, ethnicity, gender, sexuality and class.

Chloe Silverman, PhD *(University of Pennsylvania) Director, Center for Science, Technology & Society*. Associate Professor. Parent advocacy for autism, neurodiversity, and pollinator health research.

Amy Slaton, PhD *(University of Pennsylvania)*. Professor. History of science and technology; history of standards and metrology; intersectionality, race, labor.

Andrew Smith, PhD *(SUNY, Stony Brook)*. Associate Professor. Philosophy, social and political philosophy, American philosophy.

Kathryn Steen, PhD *(University of Delaware)*. Associate Professor. History of technology, history of industry and business, and comparative history.

Michael Yudell, MPH, PhD *(Columbia University) Chair, Department of Community Health*. Associate Professor. Department of Community Health and Prevention. Public health ethics; history of public health; race and racism; autism.

Emeritus Faculty

Robert J. Brulle, PhD *(George Washington University)*. Professor Emeritus. Environmental policy and politics, critical theory, marine risk, social movements, environmental sociology.

Minor in Africana Studies

About the Minor

The minor in Africana studies was created to provide the opportunity for undergraduate students throughout the University to gain an understanding of and background in the history and cultures of peoples of African descent in North and South America, the Caribbean, and Africa.

This interdisciplinary minor includes courses in anthropology, history, literature, music, political science, and sociology, and provides an opportunity for directed study in areas of particular interest to the students. The Africana studies minor has intrinsic intellectual value and helps prepare individuals to become contributors to an increasingly pluralistic society. At the same time, this minor allows students interested in business, the sciences, engineering, government, and social services to present to prospective employers a unique academic background.

All prospective students should meet with an advisor from the College as soon as possible.

Program Requirements

Required Courses

AFAS 101	Introduction to Africana Studies	3.0
AFAS 201	Cross Currents in Africana Studies	3.0
Students must complete a minimum of 18 credits from the list provided: [*]		18.0
AFAS 210	Topics in Africana Arts	

AFAS 220	Topics in Africana Society
AFAS 230	Topics in African History
AFAS 240	Topics in Africana Current Events
AFAS 255	Gender & Black Popular Culture
AFAS 260	Race, Politics and Religion
AFAS 301	Politics of Hip Hop
AFAS 385	Rum, Rice and Revolution: Caribbean History
AFAS 401	Urban Social Justice Practicum I
AFAS 402	Urban Social Justice Practicum II
AFAS I299	Independent Study in AFAS
AFAS T280	Special Topics in Africana Studies
AFAS T380	Special Topics in Africana Studies
ANTH 101	Introduction to Cultural Diversity
ANTH 310	Societies In Transition: The Impact of Modernization and the Third World
ARTH 315	African-American Art
ARTH 316	African Art
DANC 109	African Dance Technique I
ENGL 203 [WI]	Survey of World Literature (WI)
ENGL 204	Post-Colonial Literature
ENGL 207 [WI]	African American Literature
ENGL 325	Topics in World Literature **
ENGL 492	Seminar in World Literature
HIST 215	American Slavery
HIST 216	Freedom in America
MUSC 107	Jazz Ensembles
MUSC 331	World Musics
MUSC 333	Afro-American Music USA
MUSC 336	History of Jazz
PSCI 372	City in United States Political Development
SOC 210	Race, Ethnicity and Social Inequality
SOC 240	Urban Sociology
WGST 240	Women and Society in a Global Context
WGST T280	Special Topics in Women's and Gender Studies ***
Total Credits	**24.0**

*   Students must check with the Program Director for approval prior to making substitutions.

**   With a focus on the Caribbean, Latin America or the Diaspora.

***   With a focus on race or the Diaspora.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Anthropology

About the Minor

In today's globalized marketplace, Anthropology, the study of human cultural and biological diversity, is more vital than ever. Fields as varied as medicine, law, government, and business, make use of the insights of anthropologists to reach and communicate with a broad audience. The anthropology minor provides students with a cross-cultural awareness and understanding that will give them an edge up no matter what field they go into. It challenges them to think beyond their own experience and imagine the perspectives of other people and other societies. Anthropology minors graduate as cosmopolitan and engaged global citizens, with in-demand skills in researching, and making sense of, diverse human behavior.

All prospective students should meet with an advisor from the College as soon as possible.

Required (Core) Courses

ANTH 101	Introduction to Cultural Diversity	3.0
ANTH 110	Human Past: Anthropology and Prehistoric Archeology	3.0
ANTH 210 [WI]	Worldview: Science, Religion and Magic	3.0
ANTH 370	Ethnographic Methods	3.0
ANTH 410	Cultural Theory I	3.0
Select three of the following:		9.0
ANTH 111	Introduction to Biological Anthropology	
ANTH 112	Language, Culture & Cognition	
ANTH 117	Introduction to World Religions	
ANTH 120	Biblical Archaeology: The Archaeology of Israel and Jordan	
ANTH 140	Anthropology of Food	
ANTH 150	Anthropology of Water	
ANTH 205	Imagining Africa	
ANTH 212 [WI]	Topics in World Ethnography	
ANTH 215	Anthropology of Gender	
ANTH 217	Anthropology of Interfaith Relations	
ANTH 220	Aging In Cross-Cultural Perspective	
ANTH 225	Anthropology of Youth	
ANTH 240	Urban Anthropology	
ANTH 245	Reflecting on Work Identity	
ANTH 250	Anthropology of Immigration	
ANTH 255	Psychological Anthropology	
ANTH 265	Health & Healing Practices in Cross-Cultural Perspective	
ANTH 270	Comparative Religious Ethics	
ANTH 310	Societies In Transition: The Impact of Modernization and the Third World	
ANTH 312	Approaches to Intercultural Behavior	
ANTH 325	DIY Culture	
ANTH 330	Media Anthropology	
ANTH 335	Anthropology of Education	
ANTH 340	Crete Through The Looking Glass	
ANTH 345	Visual Anthropology	
ANTH 350	Anthropology of Language	
ANTH 355	Digital Culture	
ANTH 360	Culture and the Environment	
ANTH 363	Sacred Traditions of the East	
ANTH 365	Family and Kinship	
ANTH 375	Digital Ethnography	
ANTH 385	Community Engaged Anthropology	
ANTH 411	Cultural Theory II	

ANTH T180	Special Topics in Anthropology	
ANTH T280	Special Topics in Anthropology	
ANTH T380	Special Topics in Anthropology	
ANTH T480	Special Topics in Anthropology	
Total Credits		24.0

Minor in Arabic

About the Minor

Effective March 1, 2020, students will no longer be accepted into this minor. Students are encouraged to explore the Intermediate Arabic Proficiency Certificate **(p. 165) or the** Middle East and North Africa Studies minor **(p. 152).**

In our globalized world, intercultural and multilingual communication is an indispensable asset for the 21st century citizen and worker. As part of the Department of Global Studies and Modern Languages, we offer language instruction rooted in communication and embedded in authentic cultural contexts. Language study opens a world of opportunities for our students, from co-ops and study abroad programs to engagement with global communities here in Philadelphia. Media and technology, as well as travel and commerce, make the study of languages more crucial than ever, for tackling global challenges such as climate change and inequality demand that our students communicate across languages and cultures.

All prospective students should meet with an advisor from the College as soon as possible.

The Arabic minor requires 24 credits of language study above Arabic 103. Students can choose from the following courses options including a minimum 13 credits of Special Topics classes.		24.0
ARBC 201	Arabic IV	
ARBC 202	Arabic V	
ARBC 450	Advanced Studies in Language, Media, and Society	
ARBC T280	Special Topics in Arabic	
ARBC T380	Special Topics in Arabic	

* Students can take multiple Special Topics courses for Minor credit.

Minor in Asian Studies

About the Minor

This minor offers an interdisciplinary look at the East, Southeast, and South Asia regions, which hold a critically important geopolitical position in terms of not only business and security, but also in terms of political, religious, cultural, and gender studies. Together with content courses in English offered through a variety of departments, this minor also includes 12 credits of instruction in one of our three Asian languages (Chinese, Korean, or Japanese).

All prospective students should meet with an advisor from the College as soon as possible.

Students must complete 12 credits of language study in Chinese, Japanese, or Korean		12.0
Students must complete a minimum of 12 credits of elective courses		12.0-14.0
ANTH 363	Sacred Traditions of the East	
ARTH 301	Asian Art and Culture	
ARTH 302	Art of India	
ARTH 303	Art of China	
ARTH 304	Art of Japan	
ENGL 325	Topics in World Literature *	

FMST 293	Japanese Cinema: Kurosawa	
HIST 261	Making of Modern South Asia	
HIST 263	The World and China	
HIST 264	East Asia in Modern Times	
HIST 322	Empire and Environment	
PHIL 102	Introduction to Eastern Philosophy	
Total Credits		24.0-26.0

*   South Asian Literature

Study abroad, Global Studies (GST) courses at the 200 and 300 levels, and special topics courses focused on Asia will be consider for elective credit. Students must receive permission from the department.

Students who complete a minimum of 8 language credits in one language, including CHIN 202, KOR 202, or JAPN 202, are eligible to receive an intermediate language certificate.

Minor in Astrophysics

About the Minor

Astrophysics brings together many disparate areas of physics— gravitational physics govern the evolution of galaxies and clusters, nuclear physics dominates the cores of stars, electromagnetism governs the radiation that we use to observe these objects. Students majoring in mathematics and computer science, as well as other disciplines, are often fascinated by the questions raised by astrophysics.

Because of the overlap in requirements between the astrophysics minor and the physics minor, (p. 154) students cannot minor in both.

Admission Requirements

Consultation with the Physics Department.

Program Requirements

Required Prerequisite Courses		
PHYS 113 & PHYS 114 & PHYS 115	Contemporary Physics I and Contemporary Physics II and Contemporary Physics III	
OR		
PHYS 101 & PHYS 102 & PHYS 201	Fundamentals of Physics I and Fundamentals of Physics II and Fundamentals of Physics III	
Required Courses		
PHYS 217	Thermodynamics	4.0
PHYS 231	Introductory Astrophysics	3.0
PHYS 232	Observational Astrophysics	3.0
PHYS 311	Classical Mechanics I	4.0
PHYS 321	Electromagnetic Fields I	4.0
PHYS 431	Galactic Astrophysics	3.0
PHYS 432	Cosmology	3.0
Total Credits		24.0

Minor in Bioinformatics

About the Minor

The bioinformatics minor examines the application of computer technology and programming to biological fields such as genomics or proteomics. This multidisciplinary program is designed for students majoring in biomedical engineering, biological sciences, computer

science, information systems, or mathematics. Combination with other majors is possible through consultation with the program director. The minor is divided among courses in biology, programming and computation, human-computer interface design, databases, and statistics.

Program Requirements

Students must complete a minimum of 24 credits of coursework as follows:

Core Courses

BIO 331	Bioinformatics I	3.0
BIO 332	Bioinformatics II	3.0
Two Senior Research Project Courses [*]		

[*]   Until research project courses are developed specifically for this minor, the department will accept whatever research project(s) the student has taken as part of their major under the number for that major.

Area-specific courses

In each of the following five areas, the requirements of a student's major cover some of the competencies for Bioinformatics, while the remaining requirements will be fulfilled within the minor itself.
A plan of study is determined by an Advisor in the Department of Biology based on the student's major field of study. Thus, the requirements for completing the minor are determined on a case-by-case basis. Possible options for area-specific courses include the following:

Bioscience

BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
BIO 109	Biological Diversity, Ecology & Evolution	3.0
BIO 110	Biological Diversity, Ecology and Evolution Laboratory	1.0
BIO 449	Recombinant DNA Laboratory	5.0
Programming and Computation		
CS 171	Computer Programming I	3.0
CS 172	Computer Programming II	3.0
CS 260	Data Structures	3.0
Human/Computer Interface Design		
INFO 110	Introduction to Human-Computer Interaction	3.0
Databases		
CS 461	Database Systems	3.0
INFO 200	Systems Analysis I	3.0
INFO 210	Database Management Systems	3.0
Statistics		
MATH 310	Probability and Statistics	4.0
MATH 311	Probability and Statistics I	4.0
MATH 312	Probability and Statistics II	4.0
MATH 410	Scientific Data Analysis I	3.0
MATH 411	Scientific Data Analysis II	3.0

Additional Information

Please contact Dr. Jacob Russell at jar337@drexel.edu for additional information.

Minor in Biological Sciences

About the Minor

The minor in biological sciences is designed for students who wish to become acquainted with the life sciences while pursuing a major in another area. This option should be particularly useful for students majoring in areas such as chemistry, engineering, physics, or psychology who are interested in admission to medical schools or graduate programs. Students interested in the minor should consult with an academic advisor in the department for help with course selections.

Required Courses [*]

BIO 122	Cells and Genetics	4.5
BIO 124	Evolution & Organismal Diversity	4.5
BIO 126	Physiology and Ecology	4.5
BIO 218	Principles of Molecular Biology	4.0
or BIO 209	Cell, Molecular & Developmental Biology I	
BIO 224	Form, Function & Evolution of Vertebrates	4.0
or BIO 201	Human Physiology I	
BIO ELECTIVE OR ENVS 212 [**]		3.0
Total Credits		24.5

[*]   A grade of "C" or better must be earned for each course in this minor for the course to meet the requirement.

[**]   The Biology Elective can be selected from any of the regularly offered Biology department lecture courses 200-level and above according to your specific interests. BIO 212 and BIO 226 will not count towards the Biology elective. Note that existing course prerequisites may affect which courses may be selected.

Minor in Biophysics

About the Minor

Biophysics is the study of the complexity of life using tools provided by physics. It attempts to construct mathematical frameworks that explain among many other topics, how organisms obtain energy from the environment, how complex structures appear in the cell and how these relate to function. In essence, biophysics looks for principles that describe observed patterns and propose predictions based on these principles.

Admissions Requirements

Consultation and approval of the program director and completion of one of the prerequisite sequences. Students who have completed the PHYS 152 , PHYS 153 , PHYS 154 sequence will also be accepted into the minor provided they have an A- average in those courses and have completed MATH 121 and MATH 122 .

Program Requirements

Required Pre-requisites

PHYS 113	Contemporary Physics I	
PHYS 114	Contemporary Physics II	
PHYS 115	Contemporary Physics III	
OR		
PHYS 101	Fundamentals of Physics I	
PHYS 102	Fundamentals of Physics II	
PHYS 201	Fundamentals of Physics III	
Core Requirements		
PHYS 217	Thermodynamics	3.0-4.0
or CHEM 253	Thermodynamics and Kinetics	
or ENGR 210	Introduction to Thermodynamics	
PHYS 262	Introduction to Biophysics	3.0
PHYS 317	Statistical Mechanics	3.0
PHYS 321	Electromagnetic Fields I	4.0
PHYS 461	Biophysics	3.0
PHYS 462	Computational Biophysics	3.0

One course from the following:		4.5
BIO 122	Cells and Genetics	
BIO 141	Essential Biology	
One course from the following:		**3.0-4.0**
BIO 209	Cell, Molecular & Developmental Biology I	
BIO 214	Principles of Cell Biology	
BIO 218	Principles of Molecular Biology	
CHEM 371	Chemistry of Biomolecules	
Total Credits		26.5-28.5

Minor in Bioscience and Society

About the Minor

Designed for non-majors, the minor in bioscience and society is accessible to all students with an interest in biology. The minor includes a list of topical courses from which students can choose freely depending upon interest.

Please contact Leanne Sweppenheiser at lmt38@drexel.edu for additional information.

Required Courses [*]

Select one of the following options:		3.0-4.0
BIO 100	Applied Cells, Genetics & Physiology	
or		
BIO 107 & BIO 108	Cells, Genetics & Physiology and Cells, Genetics and Physiology Laboratory	
Select one of the following options:		3.0-4.0
BIO 101	Applied Biological Diversity, Ecology & Evolution	
or		
BIO 109 & BIO 110	Biological Diversity, Ecology & Evolution and Biological Diversity, Ecology and Evolution Laboratory	
ENVS 212	Evolution	4.0
Select four of the following: [**]		14.0
BIO 112	Biotechnology for Society	
BIO 114	Climate Change and Human Health	
BIO 116	How Your Body Works-Or Not	
BIO 118	Basics of Cancer	
BIO 264	Ethnobotany	
BIO 284	Biology of Stress	
ENVS 260	Environmental Science and Society	
Total Credits		24.0-26.0

[*]   A grade of "C" or better must be earned for each course in this minor for the course to meet the requirement.

[**]   Other courses may be substituted depending on yearly course offerings after consultation with an academic advisor in the Department of Biology.

Minor in Chemistry

About the Minor

The academic minor program in chemistry is designed to expose students to each of the major sub-disciplines of chemistry (analytical, inorganic, organic, and physical). In order to accomplish this students take a total of at least 27.5 credits of chemistry past the freshman year (100 level courses).

As chemistry is an experimental science at least two laboratory courses must be included in the group of courses taken for the minor. Students should note that their academic major may require certain chemistry courses that can also be used to fulfill the requirements for a minor in chemistry.

Required Courses

CHEM 241	Organic Chemistry I	4.0
CHEM 230	Quantitative Analysis	4.0
CHEM 253	Thermodynamics and Kinetics [*]	4.0
CHEM 421	Inorganic Chemistry I	3.0
CHEM 244	Organic Chemistry Laboratory I	3.0
Chemistry Electives [**]		9.5
Total Credits		27.5

[*]   May substitute CHEC 352 Physical Chemistry and Applications II (4 credits) or CHEC 353 Physical Chemistry and Applications III (4 credits) for the CHEM 253 Thermodynamics and Kinetics requirement.

[**]   The 9.5 credits of chemistry electives must include at least one additional laboratory course. These electives are selected from any of the regularly offered chemistry department lecture or laboratory courses 200-level and above according to your specific interests. Note that existing course pre-requisites may affect which courses may be selected. The variable credit courses CHEM 493 Senior Research Project or CHEM 497 Research (Undergraduate) may also be used to fulfill either the lecture or laboratory requirements for the minor.

Additional Information

For more information about the minor in chemistry, contact:

Daniel King, PhD
Undergraduate Affairs Committee Chair
Department of Chemistry
Drexel University
dk68@drexel.edu

Minor in Chinese

About the Minor

Effective March 1, 2020, students will no longer be accepted into this minor. Students are encouraged to explore the Intermediate Chinese Proficiency Certificate **(**p. 166**) or the** Asian Studies minor **(**p. 141**).**

In our globalized world, intercultural and multilingual communication is an indispensable asset for the 21st century citizen and worker. As part of the Department of Global Studies and Modern Languages, we offer language instruction rooted in communication and embedded in authentic cultural contexts. Language study opens a world of opportunities for our students, from co-ops and study abroad programs to engagement with global communities here in Philadelphia. Media and technology, as well as travel and commerce, make the study of languages more crucial than ever, for tackling global challenges such as climate change and inequality demand that our students communicate across languages and cultures.

All prospective students should meet with an advisor from the College as soon as possible.

The Chinese minor requires 24.0 credits of language study above Chinese 105. Students can choose from the following course options including 12 credits of Special Topics classes. Students will likely be required to take advanced courses abroad to complete the minor.		**24.0**
CHIN 201	Chinese IV	
CHIN 202	Chinese V	

CHIN 310	Advanced Writing and Speaking
CHIN 320	Introduction to Language for the Professions
CHIN 340	Introduction to Power and Resistance
CHIN 350	Introduction to Language, Media, and Society
CHIN 420	Advanced Topics in Language for the Professions
CHIN 440	Advanced Topics in Power and Resistance
CHIN 450	Advanced Topics in Language, Media, and Society
CHIN T380	Special Topics in Chinese

*Students can take multiple Special Topics courses for Minor credit.

Minor in Communication

About the Minor

The minor in communication is a 24.0 credit curriculum designed to familiarize students with communication theory while providing training in print and digital communication. The minor can provide a strong complement for majors that emphasize presentations, interpersonal skills, publicity, and marketing. Students minoring in communication can focus on public relations, journalism, technical and science communication, environmental communication, or nonprofit communication.

All prospective students should meet with an advisor from the College as soon as possible.

Students complete 2 required courses, 2 courses in one of the areas listed below, and four additional electives from the COM course offerings that fit their interest.

Please note: No more than three courses that are required for a student's major can count towards fulfilling requirements for the minor.

Core Courses		
COM 101	Human Communication	3.0
or COM 111	Principles of Communication	
COM 210	Theory and Models of Communication	3.0
Focus Areas		**6.0**
Select one of the following areas of focus (2 courses):		
Journalism		
COM 160	Introduction to Journalism	
COM 261	Advanced Journalism	
Public Relations		
COM 181	Public Relations Principles and Theory	
COM 270 [WI]	Business Communication	
or COM 282	Public Relations Writing	
or COM 284	Public Relations Research, Measurement and Evaluation	
Technical and Science Communication		
COM 310 [WI]	Technical Communication	
COM 320 [WI]	Science Writing	
or COM 375	Grant Writing	
Environmental Communication		
COM 316	Campaigns for Health & Environment	
or COM 318	Film, Celebrity and the Environmental Movement	
COM 317 [WI]	Environmental Communication	
FOUR Additional Courses		
Four COM or LING electives		12.0
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Computer Crime

About the Minor

The minor in computer crime grounds students in the fundamentals of crime, security and technology by focusing on the behavioral, legal, and societal factors associated with technology and deviance as they relate to both the private and public sectors. The curriculum exposes students to both the concepts and tools necessary to understand and ultimately address computer crime, such as financial fraud, identity theft and other digital crimes that cross national and international boundaries.

All prospective students should meet with an advisor from the College as soon as possible.

Required Courses		
CJS 101	Introduction to Criminal Justice	3.0
CJS 200	Criminology	3.0
CJS 276	Introduction to Computer Crime	3.0
CJS 274	Sex, Violence, & Crime on the Internet	3.0
CJS 365	Computer Investigations and the Law	3.0
CJS 377	Intellectual Property Theft in the Digital Age	3.0
Additional Elective Courses		
Select two of the following:		6.0
CJS 265	Criminal Investigation	
CJS 266	Crime Prevention Planning	
CJS 267	Introduction to Security Studies	
CJS 273	Surveillance, Technology, and the Law	
CJS 362	Gender, Crime, and Justice	
CJS 375	Criminal Procedure	
CJS T380	Special Topics in Criminology and Justice Studies	
Total Credits		24.0

Minor in Criminal Justice

About the Minor

Students from any major who are interested in the law, legal issues and the forensic sciences may envision a future connection with the criminal justice system. These students could enhance their career possibilities by adding a minor in criminal justice to their major field of study.

The minor consists of four required courses and four criminal justice electives chosen from two categories, for a total of 24.0 credits.

All prospective students should meet with an advisor from the College as soon as possible.

Required Courses

CJS 101	Introduction to Criminal Justice	3.0
CJS 200	Criminology	3.0
CJS 210	Race, Crime, and Justice	3.0
CJS 220	Crime and the City	3.0
Criminal Justice Elective Courses		
Select 12 credits from the following:		12.0
CJS 260	Justice in Our Community	
CJS 261	Prison, Society and You	
CJS 265	Criminal Investigation	
CJS 266	Crime Prevention Planning	
CJS 267	Introduction to Security Studies	
CJS 273	Surveillance, Technology, and the Law	
CJS 274	Sex, Violence, & Crime on the Internet	
CJS 275	Issues in Domestic Violence	
CJS 276	Introduction to Computer Crime	
CJS 277	Introduction to Correctional Practices	
CJS 278	Introduction to Law Enforcement	
CJS 280	Communities and Crime	
CJS 289	Terrorism	
CJS 290	Crime and Public Policy	
CJS 295	International Field Experience	
CJS 302	Advanced Criminological Theorizing	
CJS 320	Comparative Justice Systems	
CJS 330	Crime Mapping I Using Geographic Information Systems	
CJS 360	Juvenile Justice	
CJS 362	Gender, Crime, and Justice	
CJS 364	Community Corrections	
CJS 365	Computer Investigations and the Law	
CJS 366	Technology and the Justice System	
CJS 369	Forensic Science Survey Course	
CJS 372	Death Penalty - An American Dilemma	
CJS 374	Restorative Justice	
CJS 375	Criminal Procedure	
CJS 376	Sentencing	
CJS 377	Intellectual Property Theft in the Digital Age	
CJS 378	Science of Forensic Science	
CJS 379	Forensic DNA Analysis	
CJS 401	Program Evaluation	
CJS T380	Special Topics in Criminology and Justice Studies	
CJS I399	Independent Study in CJS	
Total Credits		**24.0**

Minor in Ecology

About the Minor

The minor in ecology meets the needs of engineering, science, arts, applied arts, information, and business students interested in environmental science. Prior to taking ENVS 230 *General Ecology*, students are minimally expected to have had one term to a year of both general biology and general chemistry.

All prospective students should meet with an advisor from the College as soon as possible.

Required Courses

ENVS 212	Evolution	4.0
ENVS 230	General Ecology	3.0
ENVS 260	Environmental Science and Society	3.0
ENVS 284	Physiological and Population Ecology	3.0
ENVS 286	Community and Ecosystem Ecology	3.0
ENVS 328	Conservation Biology	3.0
Environmental Science elective		3.0
Field Course		4.0
Choose one of:		
ENVS 382	Field Botany of the New Jersey Pine Barrens	
ENVS 383	Ecology of the New Jersey Pine Barrens	
ENVS 388	Marine Field Methods	
Total Credits		**26.0**

Minor in English

About the Minor

The English minor provides students from other majors with a more intensive background in literature. Coursework in the minor exposes students to literature from a variety of periods, cultures and genres and also provides practice in critical thinking, literary analysis and writing. These courses enrich students' intellectual lives and provide them with skills that are valuable in a variety of professional situations.

Where a course required for the minor is already required for a student's major, the student is directed to choose another English elective. Other substitutions are permissible at the discretion of the Program Director.

Program Requirements

Requirements

Select a minimum of 9 credits of the following:		9.0
ENGL 200 [WI]	Classical to Medieval Literature	
ENGL 201	Renaissance to the Enlightenment	
ENGL 202 [WI]	Romanticism to Modernism	
ENGL 203 [WI]	Survey of World Literature	
ENGL 204	Post-Colonial Literature	
ENGL 205 [WI]	American Literature I	
ENGL 206 [WI]	American Literature II	
ENGL 207 [WI]	African American Literature	
ENGL 211 [WI]	British Literature I	
ENGL 212	British Literature II	
ENGL 214	Readings in Fiction	
ENGL 215 [WI]	Readings in Poetry	
ENGL 216 [WI]	Readings in Drama	
Select a minimum of 6 credits of the following:		6.0
WRIT 220 [WI]	Creative Nonfiction Writing	
WRIT 225 [WI]	Creative Writing	
WRIT 301 [WI]	Writing Poetry	
WRIT 302 [WI]	Writing Fiction	
WRIT 303	Writing Humor and Comedy	
WRIT 306	Writing About the Media	
WRIT 310	Literary Editing & Publication	
WRIT 312 [WI]	Writing for Target Audiences	
WRIT T380	Special Topics in Writing	
WRIT 400 [WI]	Writing for -- and about -- the Web	
WRIT 405	Internship in Publishing	
Select a minimum of 9 credits of the following:		9.0
ENGL 300 [WI]	Literature & Science	
ENGL 302	Environmental Literature	
ENGL 303	Science Fiction	

ENGL 305 [WI]	The Mystery Story	
ENGL 306	Literature of Baseball	
ENGL 307	Literature of Genocide	
ENGL 310 [WI]	Period Studies	
ENGL 315 [WI]	Shakespeare	
ENGL 320 [WI]	Major Authors	
ENGL 325	Topics in World Literature	
ENGL 330	The Bible as Literature	
ENGL 335	Mythology	
ENGL 345	American Ethnic Literature	
ENGL 350	Jewish Literature and Civilization	
ENGL 355 [WI]	Women and Literature	
ENGL 360 [WI]	Literature and Society	
ENGL 365	Topics in African American Literature	
ENGL 370	Topics in Literature and Medicine	
ENGL 380	Literary Theory	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Environmental Studies

About the Minor

The environmental studies minor is an interdisciplinary minor designed to give students specializing in other fields a background in contemporary environmental issues and the ability to analyze such issues. For students majoring in such fields as business and engineering, the minor in environmental studies will provide them with the tools to make better decisions about products or projects related to environmental economics, politic pollutants, environmental policy, and environmental justice. For students who are liberal arts majors, the minor in environmental studies offers the opportunity to focus on the social- and natural-science aspects of the environment, and to be prepared for issues they may encounter in their careers.

All prospective students should meet with an advisor from the College as soon as possible.

Required Courses

| ENSS 120 | Introduction to Environmental Studies | 3.0 |

ENSS 283	Introduction to Environmental Policy	3.0
ENVS 260	Environmental Science and Society	3.0
Select from the following: [*]		**15.0**
ANTH 360	Culture and the Environment	
CJS 373	Environmental Crime	
COM 316	Campaigns for Health & Environment	
COM 317 [WI]	Environmental Communication	
ECON 351	Resource and Environmental Economics	
ENGL 302	Environmental Literature	
ENSS 244	Sociology of the Environment	
ENSS 285	Introduction to Urban Planning	
ENSS 326	Cities and Sustainability	
ENSS 341	Environmental Movements in America	
ENSS 346	Environmental Justice	
ENSS 348	Delaware River Issues and Policy	
ENVS 230	General Ecology	
ENVS 275	Global Climate Change	
GEO 101	Physical Geology	
HIST 321	Themes in Global Environmental History	
HIST 322	Empire and Environment	
PHIL 340	Environmental Ethics	
PHIL 341	Environmental Philosophy	
PSCI 284	Environmental Politics	
PSCI 334	Politics of Environment and Health	
PSCI 369	The Politics of Food	
PSCI 373	Animal Politics	
SOC 444	Social Movements	
Total Credits		24.0

[*]   Other courses may be taken as electives with Departmental approval.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in French

About the Minor

In our globalized world, intercultural and multilingual communication is an indispensable asset for the 21st century citizen and worker. As part of the Department of Global Studies and Modern Languages, we offer language instruction rooted in communication and embedded in authentic

cultural contexts. Language study opens a world of opportunities for our students, from co-ops and study abroad programs to engagement with global communities here in Philadelphia. Media and technology, as well as travel and commerce, make the study of languages more crucial than ever, for tackling global challenges such as climate change and inequality demand that our students communicate across languages and cultures.

All prospective students should meet with an advisor from the College as soon as possible.

The French minor requires a minimum of 24 credits above French 103, including at least 12 credits above French 310, and at least one 400 level course. Students can choose from the following 300 and 400 level courses.		**24.0**
FREN 201	French IV	
FREN 202	French V	
FREN 310	Advanced Writing and Speaking	
FREN 320	Introduction to Language for the Professions	
FREN 330	Introduction to Identities and Communities	
FREN 340	Introduction to Power and Resistance	
FREN 350	Introduction to Language, Media, and Society	
FREN 410	Advanced Grammar and Translation	
FREN 420	Advanced Studies in Language for the Professions	
FREN 430	Advanced Studies in Identities and Communities	
FREN 440	Advanced Studies in Power and Resistance	
FREN 450	Advanced Studies in Language, Media, and Society	

Minor in Geoscience

About the Minor

Geosciences are at the core of numerous problems facing the world today, and impact the lives of communities across the planet. Climate change, natural disasters, access to mineral resources and clean water, and availability of energy all shape government policies and corporate strategies, and are a cause of concern for society at large.

The geoscience minor is designed to give students specializing in other fields the skills to understand and analyze these issues. It is a natural fit for environmental science majors who wish to understand how the physical world can impact biodiversity, ecological processes and environmental impacts. For students majoring in such fields as business and engineering, the minor in geoscience will provide them with the tools to make better decisions about products or projects related to natural hazards and their impact, cost and availability of natural resources, energy policy, space exploration, land use, and environmental justice. For students who are liberal arts majors, the minor in geoscience offers the opportunity to explore earth science issues that shape the social, cultural, political and scientific debate, and to be prepared for issues they may encounter in their careers.

All prospective students should meet with an advisor from the College as soon as possible.

GEO 101	Physical Geology	4.0
GEO 102	History of the Earth	4.0
GEO Electives		**16.0**
GEO 103	Introduction to Field Methods in Earth Science	
GEO 201 [WI]	Earth Systems Processes	
GEO 205	Dinosaurs and Their World	
GEO 215	Mineralogy	
GEO 301	Advanced Field Methods in Earth Science	
GEO 306	Environmental Geology	
GEO 309	Geochemistry	
GEO 312	Sedimentology and Stratigraphy	
GEO 320	Invertebrate Paleontology	
GEO 322	Vertebrate Paleontology	
GEO 325	Structural Geology	
GEO 340	Quaternary Geology	
GEO 342	Geomorphology	
GEO 346	Coastal Geology	
GEO 348	Oceanography	
GEO 350	Volcanology	
GEO 401	Igneous and Metamorphic Petrology	
GEO 412	Geology of Groundwater	
GEO 418	Geophysics	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in German

About the Minor

Effective March 1, 2020, students will no longer be accepted into this minor. Students are encouraged to explore the Intermediate German Proficiency Certificate **(****).**

In our globalized world, intercultural and multilingual communication is an indispensable asset for the 21st century citizen and worker. As part of the Department of Global Studies and Modern Languages, we offer language instruction rooted in communication and embedded in authentic cultural contexts. Language study opens a world of opportunities for our students, from co-ops and study abroad programs to engagement with global communities here in Philadelphia. Media and technology, as well as travel and commerce, make the study of languages more crucial than ever, for tackling global challenges such as climate change and inequality demand that our students communicate across languages and cultures.

All prospective students should meet with an advisor from the College as soon as possible.

The German minor requires a minimum of 24 credits above German 103, including at least 12 credits above German 310, and at least one 400 level course. Students can choose from the following 300 and 400 level courses.		**24.0**
GER 201	German IV	

GER 202	German V
GER 310	Advanced Writing and Speaking
GER 320	Introduction to Language for the Professions
GER 330	Introduction to Identities and Communities
GER 340	Introduction to Power and Resistance
GER 350	Introduction to Language, Media, and Society
GER 410	Advanced Grammar and Translation
GER 420	Advanced Studies in Language for the Professions
GER 430	Advanced Studies in Identities and Communities
GER 440	Advanced Studies in Power and Resistance
GER 450	Advanced Studies in Language, Media, and Society

Minor in Global Studies

About the Minor

Global Studies practices socially-responsible global citizenship through a unique combination of research-oriented and multilingual instruction, professional experience, and meaningful engagement with communities both here in Philadelphia and abroad.

Students experience Global Studies by:

- Examining the movement of peoples, goods, and cultures across countries and regions
- Studying global issues in concrete socio-economic, cultural, and geographical contexts
- Tackling structural inequalities from a variety of perspectives and disciplines
- Developing intercultural and language skills through unique pedagogical models
- Working with employers and communities in Philadelphia and around the world through Drexel's Co-op opportunities

All prospective students should meet with an advisor from the College as soon as possible.

Program Requirements

Students must complete at least 201 of a language before earning the GST minor.

Core requirements		
Students are required to complete 3 200+ level GST courses		**9.0**
Global Studies Electives		**15.0**
Students must complete at least fifteen credits from the following list:		
AFAS T280	Special Topics in Africana Studies	
ANTH 117	Introduction to World Religions	
ANTH 212 [WI]	Topics in World Ethnography	
ANTH 250	Anthropology of Immigration	
ANTH 310	Societies In Transition: The Impact of Modernization and the Third World	
ANTH 312	Approaches to Intercultural Behavior	
BLAW 340	International Business Law	
COM 345	Intercultural Communication	
COM 360	International Communication	
COM 362	International Negotiations	
COM 390 [WI]	Global Journalism	
ECON 342	Economic Development	
ENGL 203 [WI]	Survey of World Literature	
ENGL 204	Post-Colonial Literature	
ENGL 325	Topics in World Literature	
ENGL 360 [WI]	Literature and Society	
ENVS 275	Global Climate Change	
ENVS 289	Global Warming, Biodiversity and Your Future	
GST 221	Introduction to Global Capital and Development	
GST 231	Introduction to Identities and Communities	
GST 241	Introduction to Power and Resistance	
GST 251	Introduction to Global Media, Arts, and Cultures	
GST 261	Introduction to Global Health and Sustainability	
GST 321	Advanced Studies in Global Capital and Development	
GST 331	Advanced Studies in Identities and Communities	
GST 341	Advanced Studies in Power and Resistance	
GST 351	Advanced Studies in Global Media, Arts, and Cultures	
GST 361	Advanced Studies in Global Health and Sustainability	
GST 435	Model Organization of American States	
GST T280	Special Topics in Global Studies	
GST T380	Special Topics in Global Studies	
GST I399	Independent Study in Global Studies	
HIST 261	Making of Modern South Asia	
HIST 315	History of Capitalism	
INTB 332	Multinational Corporations	
INTB 334	International Trade	
INTB 336	International Money and Finance	
MUSC 331	World Musics	
NFS 345	Foods and Nutrition of World Cultures	
NFS 446	Perspectives in World Nutrition	
PBHL 303	Overview of Issues in Global Health	
PBHL 304	Introduction to Health & Human Rights	
PBHL 317	The World's Water	
PHIL 335	Global Ethical Issues	
PSCI 150	International Politics	
PSCI 240	Comparative Politics II	
PSCI 252	Global Governance	
PSCI 255	International Political Economy	
PSCI 260 [WI]	Power in Protest: Social Movements in Comparative Perspective	
PSCI 351	International Organizations: The United Nations	
PSCI 352	Ethics and International Relations	
PSCI 353	International Human Rights	
PSCI 357	The European Union in World Politics	
SOC 276	Global Climate Change	
SOC 313	Sociology of Global Health	
SOC 315	HIV/AIDS and Africa	
SOC 330	Development and Underdevelopment in the Global South	
SOC 346	Environmental Justice	
WGST 240	Women and Society in a Global Context	
WGST T280	Special Topics in Women's and Gender Studies	
Total Credits		**24.0**

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/

academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in History

About the Minor

The history minor allows students in other majors to explore the historical background of their discipline, to better understand the origins of the contemporary world, and to build the knowledge and skills needed to understand the development of human societies over time and to understand historical episodes into their proper contexts. The minor in History is highly flexible and allows students to choose those History courses which appeal to them and which will contribute to their broader education. To complete the minor, students must take a total of six History courses (24.0 credits), five of which must be at the 200-level or above.

All prospective students should meet with an advisor from the College as soon as possible.

History Electives*	
*Take any 6 HIST courses; 5 of 6 must be 200-level or higher	24.0
Total Credits	24.0

Minor in History of Capitalism

About the Minor

The Minor in History of Capitalism is dedicated to the study of Capitalism and the emergence of the modern world economy from an historical perspective.

Admission Requirements

Open to all undergraduate students. All prospective students should meet with an advisor from the College as soon as possible.

Program Requirements

Required Course		
HIST 315	History of Capitalism	4.0
Complete 3 of the following courses:		**12.0**
HIST 215	American Slavery	
HIST 222	History of Work & Workers in America	
HIST 247	Modern England, 1815 - present	
HIST 264	East Asia in Modern Times	
HIST 291	Global History of Engineering	
HIST 292	Technology in American Life	
HIST 303	The Study of Global History	
HIST 316	History of American Business	
HIST 322	Empire and Environment	
HIST 334	American Empire in the Nineteenth Century	
HIST 355	Venice and the Mediterranean from the Middle Ages to Napoleon	
Complete any 2 additional history courses at the 200 level or above		**8.0**
Total Credits		24.0

Minor in Italian Studies

About the Minor

Drexel University and Philadelphia have deep connections with the Italian and Italo-American communities, from which come many Drexel students. Additionally, a significant number of faculty members across the university have research interests that connect with Italy.

The interdisciplinary minor in Italian Studies is designed to attract students interested in a variety of aspects related to Italian culture and to make use of the deep and diverse pool of resources on Drexel's campus, in the region, and abroad.

The minor in Italian Studies requires three courses (9-12 cr.) of language study. This allows students to achieve a basic level of language proficiency, with the option to continue further in the language. It also allows students whose interests lie beyond the language to pursue substantial Italy-related coursework in other disciplines. The elective side of the minor includes 12-15 credits of coursework in Italian society and culture, including a required seminar in contemporary Italy.

All prospective students should meet with an advisor from the College as soon as possible.

Program Requirements

Required courses:		
Students select 9.0-12.0 credits ITAL courses.		9.0-12.0
ITAL 230	Italy and Italians Today	3.0
Italian Studies Electives:		**12.0-13.0**
ARTH 102	History of Art II: Renaissance to Romanticism	
ARTH 325	Ancient Greek and Roman Art	
ARTH 327	Italian Renaissance Art	
CULA 305	Fundamentals of Italian Cuisine	
FMST 345	Italian Neo Realism	
HIST 355	Venice and the Mediterranean from the Middle Ages to Napoleon	
SCL 419	Global Coaching Seminar	
Total Credits		24.0-28.0

Minor in Japanese

About the Minor

In our globalized world, intercultural and multilingual communication is an indispensable asset for the 21st century citizen and worker. As part of the Department of Global Studies and Modern Languages, we offer language instruction rooted in communication and embedded in authentic cultural contexts. Language study opens a world of opportunities for our students, from co-ops and study abroad programs to engagement with global communities here in Philadelphia. Media and technology, as well as travel and commerce, make the study of languages more crucial than ever, for tackling global challenges such as climate change and inequality demand that our students communicate across languages and cultures.

All prospective students should meet with an advisor from the College as soon as possible.

The Japanese minor requires a minimum of 24 credits with a minimum of 12 credits above JAPN 310		24.0
JAPN 201	Japanese IV	
JAPN 202	Japanese V	
JAPN 310	Advanced Writing and Speaking	

JAPN 320	Introduction to Language for the Professions
JAPN 340	Introduction to Power and Resistance
JAPN 410	Advanced Grammar and Translation
JAPN 420	Advanced Studies in Language for the Professions
JAPN 440	Advanced Studies in Power and Resistance
JAPN 450	Advanced Studies in Language, Media, and Society

The Louis Stein Minor in Judaic Studies

About the Minor

The Louis Stein Minor in Judaic Studies, housed within the College of Arts and Sciences, is designed to give students the opportunity to explore and understand the history, culture, politics, and religion of the Jewish people. Through interdisciplinary coursework and directed field study, students investigate the Jewish experience from both a contemporary and a historical perspective.

The Louis Stein Minor in Judaic Studies requires 24.0 credits: 11.0 from required courses, and 13.0 from electives. Students can apply a maximum of 6.0 credits toward the minor from field study under the supervision of the academic advisor.

Program Requirements

Required Courses

JUDA 201	Jewish Literature and Civilization [*]	3.0
JUDA 202	Jewish Life and Culture in the Middle Ages [**]	4.0
JUDA 203	Modern Jewish History [†]	4.0
Minor electives		13.0
Total Credits		24.0

[*]   Offered concurrently with ENGL 350 Jewish Literature and Civilization.

[**]   Offered concurrently with HIST 253 Jewish Life and Culture in the Middle Ages.

[†]   Offered concurrently with HIST 249 Modern Jewish History.

Courses offered as electives have included:

- JUDA 211 (http://catalog.drexel.edu/search/?P=JUDA%20211) American Jewish Experience
- JUDA 212 (http://catalog.drexel.edu/search/?P=JUDA%20212) [WI (http://catalog.drexel.edu/undergraduate/collegeofartsandsciences/judaicstudies/)] Contemporary Jewish Life
- JUDA 213 (http://catalog.drexel.edu/search/?P=JUDA%20213) Jewish Cultural Tapestry
- JUDA 214 (http://catalog.drexel.edu/search/?P=JUDA%20214) Language and Cultural Diversity in the USA
- JUDA 215 (http://catalog.drexel.edu/search/?P=JUDA%20215) Reconstructing History After Genocide
- JUDA 216 (http://catalog.drexel.edu/search/?P=JUDA%20216) Yiddish Literature and Culture
- JUDA 280 (http://catalog.drexel.edu/search/?P=JUDA%20280) Special Topics in Judaic Studies
- JUDA 298 (http://catalog.drexel.edu/search/?P=JUDA%20298) Field Work in Judaic Studies
- JUDA I299 (http://catalog.drexel.edu/search/?P=JUDA%20I299) Independent Study in Judaic Studies

- ANTH 120 (http://catalog.drexel.edu/search/?P=ANTH%20120) Biblical Archeology of Israel and Jordan
- ANTH 380 (http://catalog.drexel.edu/search/?P=ANTH%20380) Special Topics in Anthropology (When offered as Archeology of the Middle East)
- HBRW 101 (http://catalog.drexel.edu/search/?P=HBRW%20101) Introduction to Hebrew I
- HBRW 102 (http://catalog.drexel.edu/search/?P=HBRW%20102) Introduction to Hebrew II
- HBRW 103 (http://catalog.drexel.edu/search/?P=HBRW%20103) Introduction to Hebrew III
- HBRW 201 (http://catalog.drexel.edu/search/?P=HBRW%20201) Intermediate Hebrew IV
- HBRW 202 (http://catalog.drexel.edu/search/?P=HBRW%20202) Intermediate Hebrew V
- HBRW 203 (http://catalog.drexel.edu/search/?P=HBRW%20203) Intermediate Hebrew VI
- ENGL 395 (http://catalog.drexel.edu/search/?P=ENGL%20395) [WI (http://catalog.drexel.edu/undergraduate/collegeofartsandsciences/judaicstudies/)] Special Studies in Literature (When offered as Jewish Women in Literature and History)
- ENGL 323 (http://catalog.drexel.edu/search/?P=ENGL%20323) Literature and Other Arts (When offered as Holocaust Testimonies)
- ENGL 345 (http://catalog.drexel.edu/search/?P=ENGL%20345) American Ethnic Literature (When offered as Jewish American Writers)
- ENGL 325 (http://catalog.drexel.edu/search/?P=ENGL%20325) Topics as World Literature (When offered as Israeli Literature & Culture, or as Yiddish Literature & Culture)
- LANG 180 (http://catalog.drexel.edu/search/?P=LANG%20180) Special Topics in Languages (When offered as Yiddish Language I)
- LANG 180 (http://catalog.drexel.edu/search/?P=LANG%20180) Special Topics in Languages (When offered as Yiddish Language II)

Additional Information

For more information about the Louis Stein Minor in Judaic Studies, please contact:

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Interim Co-Director of Judaic Studies
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Minor in Korean

About the Minor

Effective March 1, 2020, students will no longer be accepted into this minor. Students are encouraged to explore the Intermediate Korean Proficiency Certificate **(**p. 169**) or the** Asian Studies minor **(**p. 141**).**

In our globalized world, intercultural and multilingual communication is an indispensable asset for the 21st century citizen and worker. As part of the Department of Global Studies and Modern Languages, we offer language instruction rooted in communication and embedded in authentic cultural contexts. Language study opens a world of opportunities for our students, from co-ops and study abroad programs to engagement with global communities here in Philadelphia. Media and technology, as well as travel and commerce, make the study of languages more crucial than ever, for tackling global challenges such as climate change and inequality demand that our students communicate across languages and cultures.

All prospective students should meet with an advisor from the College as soon as possible.

The Korean minor requires 24.0 credits above KOR 103. Students can select from the following course options including 12.0 credits of Special Topics classes. Students will likely be required to take advanced courses abroad to complete the minor.		24.0
KOR 201	Korean IV	
KOR 202	Korean V	
KOR 310	Advanced Writing & Speaking	
KOR 350	Introduction to Language, Media, and Society	
KOR 410	Advanced Grammar and Translation	
KOR 450	Advanced Topics in Language, Media, and Society	
KOR T380	Special Topics in Korean	

*Students can take multiple Special Topics courses for Minor credit.

Minor in Mathematics

About the Minor

The minor in Mathematics requires core courses in Calculus and Linear Algebra, as well as a selection of electives from a range of other areas. The minor complements programs in physics, computer science, finance or engineering, demonstrating further expertise and preparing students to excel after graduation.

All prospective students should meet with an advisor from the College as soon as possible.

Program Requirements

The minor in mathematics consists of five required courses and elective courses from the specified group of courses listed below resulting in a minimum of 38.0 credits.

Required Courses

MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
MATH 200	Multivariate Calculus	4.0
MATH 201	Linear Algebra *	3.0-4.0
or MATH 261	Linear Algebra	

Mathematics Minor Electives **

Select from the following:		18.0-19.0
MATH 210	Differential Equations *	
or MATH 262	Differential Equations	
MATH 220 [WI]	Introduction to Mathematical Reasoning	
MATH 221	Discrete Mathematics	
MATH 235	Math Competition Problem Solving Seminar	
MATH 250	Mathematics of Investment and Credit	

MATH 285	Differential Equations II	
MATH 291	Complex and Vector Analysis for Engineers ***	
MATH 300	Numerical Analysis I	
MATH 301	Numerical Analysis II	
MATH 305	Introduction to Optimization Theory	
MATH 311	Probability and Statistics I	
MATH 312	Probability and Statistics II	
MATH 316	Mathematical Applications of Symbolic Software	
MATH 318 [WI]	Mathematical Applications of Statistical Software	
MATH 319	Techniques of Data Analysis	
MATH 320	Actuarial Mathematics	
MATH 321	Vector Calculus	
MATH 322	Complex Variables	
MATH 323	Partial Differential Equations	
MATH 331	Abstract Algebra I	
MATH 332	Abstract Algebra II	
MATH 387	Linear Algebra II	
MATH 401	Elements of Modern Analysis I	
MATH 402	Elements of Modern Analysis II	
MATH 410	Scientific Data Analysis I	
MATH 411	Scientific Data Analysis II	
MATH 422	Introduction to Topology	
MATH 449	Mathematical Finance	
MATH 450	Introduction to Graph Theory	
MATH 475	Cryptography	
MATH 483	Discrete Event Simulation	
MATH 489	Tensor Calculus	
Total Credits		38.0

* Students count only one of these two courses for their minor.

** A request form is available for any other mathematics courses upon the written approval prior to the beginning of the quarter in which the course is to be offered. Students should contact the Mathematics undergraduate academic advisor.

*** Students who take MATH 291 cannot also count MATH 321 or MATH 322 toward their minor.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Medical Sociology

About the Minor

The minor in medical sociology is designed to give students a broader understanding of the social dimensions of contemporary medical practice. Investigating health and illness from a national and global perspective, the minor helps students understand the relations between inequalities, health care and social justice; trends in health professions; and the importance of organizations to health care. For students majoring in such fields as health sciences, nursing, or biology, the minor in medical sociology complements their scientific training with a social science focus on humans, policy, and power in healthcare.

Admission Requirements

Open to all undergraduate Drexel students. All prospective students should meet with an advisor from the College as soon as possible.

Program Requirements

Required Courses *

SOC 235	Sociology of Health and Illness	4.0
Select three courses from the following:		12.0
SOC 238	Sociology of Health Professions	
SOC 271	Sociology of Aging	
SOC 313	Sociology of Global Health	
SOC 318	Social Networks and Health	
SOC 370	Practicum in Applied and Community Sociology	
SOC 405	Medicine, Technology and Science	
SOC 430	Politics of Life	
Select two of the following:		8.0
SOC 210	Race, Ethnicity and Social Inequality	
SOC 220	Wealth and Power	
SOC 240	Urban Sociology	
SOC 241	Research Design: Qualitative Methods	
SOC 242	Research Design: Quantitative Methods	
SOC 355 [WI]	Classical Social Theory	
SOC 356 [WI]	Contemporary Social Theory	
Total Credits		24.0

*   No more than three courses that are required for a student's major may count towards fulfilling requirements for the minor.

Minor in Middle East and North Africa Studies

About the Minor

This minor offers an interdisciplinary look at the Middle East and North Africa region, which holds a critically important geopolitical position in terms of not only security and energy, but also in terms of political, religious, cultural, and gender studies. Together with content courses in English offered through a variety of departments, this minor also includes 12.0 credits of Arabic language instruction.

All prospective students should meet with an advisor from the College as soon as possible.

Program Requirements

Core Requirements

Students must complete 12 credits of Arabic language coursework	12.0

MENA 101	The Middle East and North Africa Today: Culture and Democracy	3.0
Students must complete a minimum of 9 credits of elective courses		**9.0-10.0**
ANTH 120	Biblical Archaeology: The Archaeology of Israel and Jordan	
GST 241	Introduction to Power and Resistance (Gender Politics in the Middle East)	
GST 341	Advanced Studies in Power and Resistance (Revolution and Counter Revolution in the Arab World)	
HIST 206	Race and Islam in Africa and the Middle East	
Total Credits		24.0-25.0

Study abroad, special topics, and GST courses focused on the Middle East or North Africa will be considered for elective credit. Students must receive permission from the department.

Students who complete a minimum of 8.0 Arabic credits, including ARBC 202, are eligible to receive an intermediate language certificate.

Minor in Neuroscience

About the Minor

The Neuroscience minor allows students from a vast array of disciplines the opportunity for formalized study in Neuroscience. This interdisciplinary minor integrates content from cellular, molecular, and systems neurobiology with neuropsychology, providing students with a strong foundation in basic principles of neurobiology and neuropsychology. This minor is a collaborative effort between Biology and Psychology, but is open to students in any major with an interest in gaining a deeper understanding of the biological and cognitive principles underlying brain function.

Please contact Leanne Sweppenheiser at lmt38@drexel.edu for additional information.

Required Courses		
BIO 348	Neuroscience: From Cells to Circuits	3.0
BIO 349	Behavioral Neuroscience	3.0
PSY 312	Cognitive Neuroscience	3.0
PSY 410	Neuropsychology	3.0
Biology and Psychology Electives [*]		
Select 2 BIO courses		**6.0**
BIO 414	Behavioral Genetics	
BIO 461	Neurobiology of Autism Disorders	
BIO 462	Biology of Neuron Function	
BIO 463	Molecular Mechanisms of Neurodegeneration	
BIO 465	Neurobiology of Disease	
Select 2 PSY courses		**6.0**
PSY 212	Physiological Psychology	
PSY 213	Sensation and Perception	
PSY 310	Drugs & Human Behavior	
PSY 325	Psychology of Learning	
PSY 330	Cognitive Psychology	
PSY 336	Psychology of Language	
Total Credits		24.0

A grade of "C" or better must be earned for each course in this minor to meet the requirements.

* 3 credits of research in neuroscience as BIO 497 or PSY 499 can be substituted for 1 elective in either of the categories

Minor in Nonprofit Communication

About the Minor

The minor in nonprofit communication is a 24.0 credit curriculum designed to familiarize students with general communication theory and practice while providing training in print and electronic communication skills peculiar to the nonprofit sector. In addition to conventional course work this minor will include a practicum in the form of a 3.0 credit independent study (COM I399) for one term in which students will provide service and consultation for an area nonprofit organization as selected and coordinated by Drexel Edits (http://www.drexel.edu/coas/academics/departments-centers/communication/drexel-edits/), the university's center for the support of nonprofit communication.

All prospective students should meet with an advisor from the College as soon as possible.

Program Requirements

Core Courses

COM 181	Public Relations Principles and Theory	3.0
COM 375 [WI]	Grant Writing	3.0
COM 376	Nonprofit Communication	3.0
COM 377	Communication for Civic Engagement	3.0
COM 378	Public Service Campaigns	3.0
COM I399	Independent Study in COM	3.0
Choose at least 2 courses:		**6.0**
COM 160	Introduction to Journalism	
COM 222	Interpersonal Communication	
COM 247	Social Media in Communication	
COM 265	Audio Journalism	
COM 270 [WI]	Business Communication	
COM 282 [WI]	Public Relations Writing	
COM 330	Professional Presentations	
COM 363	Event Planning	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Philosophy

About the Minor

A philosophy minor adds depth and breadth to your college education. Philosophy classes train you to be a critical thinker and a thoughtful, reflective person. They assist you in developing more careful reading skills and more effective writing and speaking skills. They also give you a lot of practice constructing and criticizing logical arguments. More than almost any other minor a philosophy minor will broaden and enhance your education and help you develop skills you will use in your career and also in everyday life. The minor requires a variety of classes including an introduction, a logic course, three "foundations" courses, an "area elective", an applied ethics course, and one 400-level History of Philosophy seminar.

Students who have completed 30.0 credits may apply for the philosophy minor by meeting with an advisor from the College as soon as possible.

Required Courses

PHIL 101	Introduction to Western Philosophy	3.0
or PHIL 102	Introduction to Eastern Philosophy	
PHIL 105	Critical Reasoning	3.0
or PHIL 111	Symbolic Logic I	
Select three Philosophy Foundations Electives:		**9.0**
PHIL 207	Symbolic Logic II	
PHIL 211	Metaphysics: Philosophy of Reality	
PHIL 212	Ancient Philosophy	
PHIL 214	Modern Philosophy	
PHIL 215	Contemporary Philosophy	
PHIL 221	Epistemology: Philosophy of Knowledge	
PHIL 231	Aesthetics: Philosophy of Art	
PHIL 241	Social & Political Philosophy	
PHIL 251	Ethics	
Select one Philosophy Area Elective:		**3.0**
PHIL 210	Philosophy of Sport	
PHIL 216	Philosophy of Time	
PHIL 218	Philosophy of Mathematics	
PHIL 255	Philosophy of Sex & Love	
PHIL 341	Environmental Philosophy	
PHIL 351	Philosophy of Technology	
PHIL 355	Philosophy of Medicine	
PHIL 361	Philosophy of Science	
PHIL 381 [WI]	Philosophy in Literature	
PHIL 385	Philosophy of Law	
PHIL 391	Philosophy of Religion	
Select one Applied Ethics Elective:		**3.0**
PHIL 301	Business Ethics	
PHIL 305	Ethics and the Media	
PHIL 311	Ethics and Information Technology	
PHIL 315	Engineering Ethics	
PHIL 317	Ethics and Design Professions	
PHIL 321	Biomedical Ethics	
PHIL 323	Organizational Ethics	
PHIL 325	Ethics in Sports Management	
PHIL 330	Criminal Justice Ethics	
PHIL 335	Global Ethical Issues	
PHIL 340	Environmental Ethics	
Select one Philosophy Seminar Elective:		**3.0**
PHIL 421 [WI]	Seminar in Ancient Philosophy	
PHIL 431 [WI]	Seminar in Modern Philosophy	
PHIL 461 [WI]	Seminar in Contemporary Philosophy	

PHIL 481 [WI]	Seminar in a Philosophical School	
PHIL 485 [WI]	Seminar in a Major Philosopher	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Physics

About the Minor

Physics is a science that studies the natural phenomena at all scales, from that of the universe to elementary particles. This minor exposes the students to some of the basic principles of physics and would easily complement any other discipline—from engineering to other sciences.

The minor in physics requires a total of 10.0 credits from the elective list in addition to the prerequisite and core courses.

Because of the overlap in requirements between the astrophysics minor (p. 141) and the physics minor, students cannot minor in both.

All prospective students should meet with an advisor from the College as soon as possible.

Required Prerequisite Courses [*]		
PHYS 113	Contemporary Physics I	
PHYS 114	Contemporary Physics II	
PHYS 115	Contemporary Physics III	
Required Courses		
PHYS 311	Classical Mechanics I	4.0
PHYS 321	Electromagnetic Fields I	4.0
PHYS 217	Thermodynamics	4.0
PHYS 326	Quantum Mechanics I	4.0
Electives		
Select at least 10.0 credits from PHYS courses at the 300 level or above		10.0
Total Credits		26.0

[*]   PHYS 101, PHYS 102 and PHYS 201 will also satisfy the prerequisite requirements.

Minor in Politics

About the Minor

A Minor in Politics enriches almost every major. With a Minor in Politics, you can hone your analytical and critical thinking skills and take your understanding of political science and research methodology to your field of study.

Political science pairs well with economics, criminal justice, psychology, public health, history, anthropology, communications or education.

All prospective students should meet with an advisor from the College as soon as possible.

Required Courses		
Select three of the following:		12.0
PSCI 100	Introduction to Political Science	
PSCI 110	American Government	
PSCI 120	History of Political Thought	
PSCI 130	Research Design for Political Science	
PSCI 140	Comparative Politics I	
PSCI 150	International Politics	
Political Science Electives		
12.0 credits of any additional 200-level or higher PSCI courses.		12.0
Total Credits		24.0

Minor in Psychology

About the Minor

The minor in psychology is intended to meet the needs of students who recognize that an understanding and analysis of individual psychological processes is a key component of their education. Students in the minor learn how to ask and answer important questions regarding human behavior, cognition and emotion to complement their major. The minor may also be of interest to students who have an interest in a double major but are unable to satisfy all of the requirements in two major fields.

Entry into the minor requires that PSY 101 *General Psychology* (or an equivalent introductory course) be taken as a prerequisite. Students who have completed and who are interested in a minor in Psychology are expected to meet with the Psychology Department Academic Adviser to discuss the selection of courses appropriate to their major and their own personal interests. No more than three courses that are required for a student's major can count towards fulfilling requirements for the minor.

Required Prerequisite		
PSY 101	General Psychology I (or equivalent)	
Required Courses		
Select eight of the following:		24.0
PSY 120	Developmental Psychology	
PSY 140	Approaches to Personality	
PSY 150	Introduction to Social Psychology	
PSY 210	Evolutionary Psychology	
PSY 212	Physiological Psychology	
PSY 213	Sensation and Perception	
PSY 240 [WI]	Abnormal Psychology	
PSY 245 [WI]	Sports Psychology	
PSY 250 [WI]	Industrial Psychology	
PSY 252	Death and Dying	
PSY 264	Computer-Assisted Data Analysis I	
PSY 265	Computer-Assisted Data Analysis II	

PSY 290	History and Systems of Psychology	
PSY 310	Drugs & Human Behavior	
PSY 325	Psychology of Learning	
PSY 330	Cognitive Psychology	
PSY 332	Human Factors and Cognitive Engineering	
PSY 337	Human-Computer Interaction	
PSY 340	Psychological Testing and Assessment	
PSY 360 [WI]	Experimental Psychology	
PSY 380	Psychological Testing and Assessment	
PSY 410	Neuropsychology	
PSY 442	Theories & Practices in Clinical Psychology	
PSY T480	Special Topics in Psychology	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Religious Studies

About the Minor

This minor provides an interdisciplinary approach to the study of religion with much flexibility to accommodate individual student interest. Students will gain a global comparative perspective on world religions.

Admission Requirements

All prospective students should meet with an advisor from the College as soon as possible.

Program Requirements

Students must complete three courses from this list		**9.0-10.0**
ANTH 117	Introduction to World Religions	
ANTH 210 [WI]	Worldview: Science, Religion and Magic	
ANTH 363	Sacred Traditions of the East	
ENGL 330	The Bible as Literature	
HIST 260	Coexistence and Conflict: Jews, Christians, and Muslims in the Early Mediterranean	
PHIL 391	Philosophy of Religion	
Students must complete at least 15 credits of additional elective courses, including a minimum of two different course rubrics:		**15.0-17.0**
ANTH 117	Introduction to World Religions	

ANTH 120	Biblical Archaeology: The Archaeology of Israel and Jordan	
ANTH 210 [WI]	Worldview: Science, Religion and Magic	
ANTH 217	Anthropology of Interfaith Relations	
ANTH 270	Comparative Religious Ethics	
ANTH 363	Sacred Traditions of the East	
ENGL 330	The Bible as Literature	
ENGL 335	Mythology	
ENGL 350	Jewish Literature and Civilization	
or JUDA 201	Jewish Literature and Civilization	
HIST 181	Religion, Science, and Medicine in History	
HIST 206	Race and Islam in Africa and the Middle East	
HIST 249	Modern Jewish History	
or JUDA 20	Modern Jewish History	
HIST 253	Jewish Life and Culture in the Middle Ages	
or JUDA 202	Jewish Life and Culture in the Middle Ages	
HIST 257	The Reformation Age	
HIST 260	Coexistence and Conflict: Jews, Christians, and Muslims in the Early Mediterranean	
HIST 358	Witches, Demons, and Witch-hunters in European History	
JUDA 212 [WI]	Contemporary Jewish Life	
JUDA 216	Yiddish Literature & Culture	
PHIL 102	Introduction to Eastern Philosophy	
PHIL 291	Judaism and Christianity: Two Religions or One?	
PHIL 391	Philosophy of Religion	
RELS T280	Special Topics in Religious Studies [*]	
RELS T380	Special Topics in Religious Studies [*]	
Total Credits		24.0-27.0

[*] Special Topics courses focused on religious studies will be considered for elective credit. Students must receive permission from the department.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Science, Technology and Society

About the Minor

The minor in Science, Technology and Society (STS) allows students to explore the cultural, ethical, historical, political, and institutional dimensions of science, medicine, and technology. By taking courses in different disciplines, students develop an interdisciplinary approach that empowers them to critically analyze the social dimensions of science, medicine, and technology. STS programs, also called science and technology studies, are growing in the US and worldwide. The ability to critically identify the values and incentives built into scientific knowledge and technology design and use is highly valued in settings such as health care organizations, government agencies, public policy realms, tech industries, and more.

For more information about this program, visit Drexel's Center for Science, Technology and Society (http://drexel.edu/coas/academics/departments-centers/science-technology-society/) page. All prospective students should meet with an advisor from the College as soon as possible.

Select 6 - 8 classes from the list below, with a minimum of 24 credits. One class must be SCTS 101. At least 2 different subject areas must be represented among these classes.		24.0
ANTH 330	Media Anthropology	
ANTH 345	Visual Anthropology	
ANTH 355	Digital Culture	
ANTH 360	Culture and the Environment	
ARCH 315	Sustainable Built Environment I	
BIO 112	Biotechnology for Society	
BIO 114	Climate Change and Human Health	
BIO 212	Biotechnology	
COM 240	New Technologies In Communication	
COM 247	Social Media in Communication	
COM 351	Computer Mediated Communication	
CJS 210	Race, Crime, and Justice	
CJS 220	Crime and the City	
CJS 273	Surveillance, Technology, and the Law	
CJS 274	Sex, Violence, & Crime on the Internet	
CJS 366	Technology and the Justice System	
ENGL 300 [WI]	Literature & Science	
ENGL 302	Environmental Literature	
ENGL 303	Science Fiction	
ENGL 370	Topics in Literature and Medicine	
INTR 310	Sustainability: History, Theory and Critic	
HIST 283	Technology and Identity	
HIST 285	Technology in Historical Perspective	
HIST 287	History of Science: Ancient to Medieval	
HIST 288	History of Science: Medieval to Enlightenment	
HIST 289	History of Science: Enlightenment to Modernity	
HIST 290	Technology and the World Community	
HIST 291	Global History of Engineering	
HIST 292	Technology in American Life	
HIST 320	Disaster in Global History	
HIST 321	Themes in Global Environmental History	
HIST 340	History of Bodies in Science, Technology, and Medicine	
HIST 341	Disabilities in History	
HIST 385	Transnational History of Science, Technology and Environment	
PBHL 302	Introduction to the History of Public Health	
PHIL 111	Symbolic Logic I	
PHIL 207	Symbolic Logic II	
PHIL 311	Ethics and Information Technology	
PHIL 321	Biomedical Ethics	
PHIL 322	Ethics of Human Enhancement	
PHIL 340	Environmental Ethics	
PHIL 341	Environmental Philosophy	
PHIL 351	Philosophy of Technology	
PHIL 355	Philosophy of Medicine	
PHIL 361	Philosophy of Science	
PSCI 284	Environmental Politics	
PSCI 289	Technology and Politics	
PSCI 334	Politics of Environment and Health	
PSCI 369	The Politics of Food	
PSCI 371	Science, Technology, & Public Policy	
PSY 290	History and Systems of Psychology	
SCTS 101	Introduction to Science, Technology, and Society	
SCTS 200	Addiction & Society	
SCTS 202	Innovation and Social Justice	
SCTS 205	Artificial Intelligence and Society	
SCTS 207	Medicine and Society	
SOC 235	Sociology of Health and Illness	
SOC 276	Global Climate Change	
SOC 241	Research Design: Qualitative Methods	
SOC 244	Sociology of the Environment	
SOC 341	Environmental Movements in America	
SOC 346	Environmental Justice	
SOC 349	Sociology of Disasters	
SOC 430	Politics of Life	
WGST 225	Women & Human Rights Worldwide	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Sociology

About the Minor

The sociology minor is designed to give students specializing in other fields a broader knowledge of contemporary social issues and the ability to analyze them in a reasoned fashion. For students majoring in such fields as business and engineering, the minor helps develop skills in

critical thinking that go beyond the acquisition of specialized, professional techniques. For students majoring in another area of the liberal arts, the minor offers the opportunity to place the issues raised in the major discipline within a larger social context.

All prospective students should meet with an advisor from the College as soon as possible.

Please note: No more than three courses that are required for a student's major can count towards fulfilling requirements for the minor.

Required Courses [*]		
SOC 355 [WI]	Classical Social Theory	4.0
or SOC 356	Contemporary Social Theory	
Select five of the following: [**]		20.0
SOC 115	Social Problems	
SOC 210	Race, Ethnicity and Social Inequality	
SOC 215	Sociology of Work	
SOC 220	Wealth and Power	
SOC 221	Sociology of the Family	
SOC 222	Sex and Society	
SOC 230	Gender and Society	
SOC 235	Sociology of Health and Illness	
SOC 238	Sociology of Health Professions	
SOC 240	Urban Sociology	
SOC 241	Research Design: Qualitative Methods	
SOC 242	Research Design: Quantitative Methods	
SOC 268	Sociology of Sport	
SOC 271	Sociology of Aging	
SOC 276	Global Climate Change	
SOC 313	Sociology of Global Health	
SOC 315	HIV/AIDS and Africa	
SOC 318	Social Networks and Health	
SOC 320	Sociology of Deviance	
SOC 330	Development and Underdevelopment in the Global South	
SOC 340	Globalization	
SOC 341	Environmental Movements in America	
SOC 346	Environmental Justice	
SOC 349	Sociology of Disasters	
SOC 405	Medicine, Technology and Science	
SOC 406	Housing and Homelessness	
SOC 410	Imagining Multiple Democracies	
SOC 420	Love, Rage & Debt: The Debt Society	
SOC 430	Politics of Life	
SOC 444	Social Movements	
SOC T380	Special Topics in SOC	
SOC 450	Capstone in Sociology	
SOC T480	Special Topics in Sociology	
SOC I499	Independent Study in SOC	
Total Credits		24.0

[*]   No more than three courses that are required for a student's major can count towards fulfilling requirements for the minor.

[**]   Students must take at least three elective courses at the 300 or 400 level.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end

of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Spanish

About the Minor

In our globalized world, intercultural and multilingual communication is an indispensable asset for the 21st century citizen and worker. As part of the Department of Global Studies and Modern Languages, we offer language instruction rooted in communication and embedded in authentic cultural contexts. Language study opens a world of opportunities for our students, from co-ops and study abroad programs to engagement with global communities here in Philadelphia. Media and technology, as well as travel and commerce, make the study of languages more crucial than ever, for tackling global challenges such as climate change and inequality demand that our students communicate across languages and cultures.

All prospective students should meet with an advisor from the College as soon as possible.

The Spanish minor requires a minimum of 24 credits above SPAN 103, including at least 12 credits above SPAN 310, and at least one 400 level course. Students can choose from the following 300 and 400 level courses.		24.0
SPAN 201	Spanish IV	
SPAN 202	Spanish V	
SPAN 310	Advanced Writing and Speaking	
SPAN 320	Introduction to Language for the Professions	
SPAN 330	Introduction to Identities and Communities	
SPAN 340	Introduction to Power and Resistance	
SPAN 350	Introduction to Language, Media, and Society	
SPAN 410	Advanced Grammar and Translation	
SPAN 420	Advanced Studies in Language for the Professions	
SPAN 430	Advanced Studies in Identities and Communities	
SPAN 440	Advanced Studies in Power and Resistance	
SPAN 450	Advanced Studies in Language, Media, and Society	

Minor in War and Society

About the Minor

This history minor concentrates on the history of wars, military and related institutions, and their broader historical and political contexts.

All prospective students should meet with an advisor from the College as soon as possible.

Program Requirements

Complete 4 of the following courses: [*]		16.0
HIST 230	United States Military History I (before 1900)	
HIST 231	US Military History II (since 1900)	
HIST 234	The United States Civil War	
HIST 235	The Great War, 1914-1918	
HIST 236	World War II	
HIST 239	The Pacific War	
HIST 331	The American Revolution	
HIST 333	U.S.-Mexican War	
HIST 338	The Vietnam War	
HIST 341	Disabilities in History	
HIST 370	Conquest of Mexico	
PSCI 150	International Politics	
PSCI 250	American Foreign Policy	
PSCI 310	Civilians in Armed Conflict	
PSCI 352	Ethics and International Relations	
PSCI 353	International Human Rights	
PSCI 360	International Law	
Complete any 2 additional history courses		**8.0**
Total Credits		24.0

[*]   At least 8 credits must be for History courses.

Minor in Women's and Gender Studies

About the Minor

The Women's and Gender Studies (WGST) Minor gives students a broad, interdisciplinary and global understanding of how gender intersects with race, age, class, sexual orientation, and other identities that shape human consciousness and experience. The WGST minor equips women, men and people who are gender variant with tools for making sense of societal structures within which they must operate as students, professionals and citizens. Through comparative study of gender across cultures, both within the United States and globally, students who minor in WGST gain a critical lens on the complexities of gender as it is constructed and understood in diverse contexts. Through WGST courses, students develop skills to be attuned to how gender impacts all aspects of human interaction, from the family, to the workplace, to the voting booth.

As an academic program Women's and Gender Studies provides a sharp focus on assumptions about the way the world can and does work. It offers a conceptual framework to analyze experiences of inequality and discrimination, and asks students to become active, engaged, thoughtful participants in their educational experiences and in their lives. Women's and Gender Studies prioritizes learning that helps students understand their "real life" experiences, at the same time that it asks students to reflect on and ask difficult, provocative and meaningful questions about those experiences.

Women's and Gender Studies works with many programs and departments at Drexel to emphasize how gender and sexuality intersect with other identities, as well as history, culture and geography to produce different beliefs, experiences and practices in peoples' lives and in larger social structures.

Because businesses working across many industries, including those in the nonprofit sector, are increasingly sensitive to issues such as gender discrimination, sexual harassment, equal pay for comparable work, support for LGBTQ-identified employees, parental leave, and day care, students with a Minor in Women's and Gender Studies gain a definite edge over other applicants for managerial and policy-making positions.

All prospective students should meet with an advisor from the College as soon as possible.

Required Courses		
WGST 101	Introduction to Women's and Gender Studies	3.0
WGST 201	Introduction to Feminisms	3.0
Choose one of the following three theory courses		**3.0**
WGST 301	Sex, Gender, Feminism: A Seminar in Feminist Theories	
WGST 308	Queer Theory	
WGST 320	Masculinities	
Students must complete at least 15 credits of elective courses:		**15.0**
AFAS 255	Gender & Black Popular Culture	
ANTH 215	Anthropology of Gender	
ANTH 365	Family and Kinship	
ARTH 340	Women in Art	
COM 246	Media and Identity	
CJS 274	Sex, Violence, & Crime on the Internet	
CJS 275	Issues in Domestic Violence	
CJS 362	Gender, Crime, and Justice	
ENGL 355 [WI]	Women and Literature	
HIST 208	Women in American History	
HIST 283	Technology and Identity	
PBHL 305	Women and Children: Health & Society	
PHIL 255	Philosophy of Sex & Love	
PSY 356	Women's Health Psychology	
SMT 254	Women & Minority Opportunities in Sport	
SMT 255	Legal Foundations of Title IX	
SOC 222	Sex and Society	
SOC 230	Gender and Society	
WGST 220	Writing on the Body	
WGST 225	Women & Human Rights Worldwide	
WGST 230	Arab Women Writers	
WGST 235	African Francophone Women Writers: Displacement. From One Continent To Another	
WGST 240	Women and Society in a Global Context	
WGST 255	Gender and Black Popular Culture	
WGST 260	Gender and Judaism	
WGST 270	Cigarettes and High Heels	
WGST 275	Women's Health and Human Rights	
WGST T280	Special Topics in Women's and Gender Studies	
WGST I299	Independent Study in Women's and Gender Studies	
WGST 301	Sex, Gender, Feminism: A Seminar in Feminist Theories	
WGST 308	Queer Theory	
WGST 320	Masculinities	
WGST 324	Retail Intersections: Social & Cultural Issues	
WGST T380	Special Topics in Women's and Gender Studies	
WGST T480	Special Topics in Women's and Gender Studies	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic

advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Writing

About the Minor

The Minor in Writing invites students from all disciplines to develop their writing skills and further their abilities to think critically and creatively by encouraging them to make connections beyond the scope of their discipline.

Students who complete the Minor in Writing will:

- be better positioned to succeed as writers in their future professional and personal endeavors;
- obtain a strong background in theoretical perspectives and practices of writing and rhetoric, as well as reading;
- achieve a better understanding of writing within their major fields of study;
- gain significant practice and experience in writing in many genres and rhetorical modes.

All prospective students should meet with an advisor from the College as soon as possible.

Program Requirements

Required Courses

COM 210	Theory and Models of Communication	3.0
or ANTH 350	Anthropology of Language	
or PHIL 305	Ethics and the Media	
or WRIT 200	Language Puzzles and Word Games: Issues in Modern Grammar	
ENGL 340 [WI]	Classical Rhetoric	3.0
or WRIT 210	The Peer Reader in Context	
or WRIT 400	Writing for -- and about -- the Web	
or WRIT 212	Argument and Rhetoric	
WRIT 225 [WI]	Creative Writing	3.0
WRIT 312 [WI]	Writing for Target Audiences	3.0
or WRIT 315	Writing for Social Change	

Reading Courses

Select one of the following:		3.0
ENGL 200 [WI]	Classical to Medieval Literature	
ENGL 201	Renaissance to the Enlightenment	
ENGL 202 [WI]	Romanticism to Modernism	
ENGL 203	Survey of World Literature	
ENGL 204	Post-Colonial Literature	
ENGL 205 [WI]	American Literature I	
ENGL 206 [WI]	American Literature II	
ENGL 207 [WI]	African American Literature	
ENGL 211 [WI]	British Literature I	
ENGL 212	British Literature II	
ENGL 214	Readings in Fiction	
ENGL 215 [WI]	Readings in Poetry	
ENGL 216 [WI]	Readings in Drama	
PHIL 105	Critical Reasoning	
PSCI 330	Public Opinion & Propaganda	
WRIT 295	Forms Seminar	

Theoretical Perspectives on Writing Courses

Select one of the following:		3.0
ANTH 330	Media Anthropology	
ANTH 350	Anthropology of Language [*]	
CJS 377	Intellectual Property Theft in the Digital Age	
COM 220	Qualitative Research Methods	
COM 355	Ethnography of Communication	
EDUC 236	Early Literacy I	
EDUC 326 [WI]	Language Arts Processes	
ENGL 340 [WI]	Classical Rhetoric [*]	
PHIL 305	Ethics and the Media [*]	
PSCI 335	Political Communication	
PSY 336	Psychology of Language	
WRIT 200	Language Puzzles and Word Games: Issues in Modern Grammar	
WRIT 210 [WI]	The Peer Reader in Context [*]	
WRIT 211	Advanced Composition	
WRIT 212	Argument and Rhetoric	
WRIT 250	"Mistakes Were Made": Truth, Writing, and Responsibility	

Writing in Practice Courses

Select two of the following:		6.0
COM 160	Introduction to Journalism	
COM 270 [WI]	Business Communication	
COM 310 [WI]	Technical Communication	
COM 320 [WI]	Science Writing	
COM 335	Digital Publishing	
CULA 412	Food Writing	
DSMR 233 [WI]	Retail Image Analysis	
FASH 467	Style and the Media	
SCRP 220	Playwriting I	
SCRP 225	Playwriting II	
SCRP 270 [WI]	Screenwriting I	
SCRP 275 [WI]	Screenwriting II	
SCRP 350	TV Comedy Practicum	
SCRP 353	TV Drama Practicum	
TVPR 220	TV News Writing	
WRIT 215 [WI]	Story Medicine	
WRIT 220 [WI]	Creative Nonfiction Writing	
WRIT 226	Writing in Public Spaces	
WRIT 301 [WI]	Writing Poetry	
WRIT 302 [WI]	Writing Fiction	
WRIT 303	Writing Humor and Comedy	
WRIT 305	Life is Beautiful	
WRIT 306	Writing About the Media	
WRIT 310	Literary Editing & Publication	
WRIT 311	Writing and Reading the Memoir	
WRIT 315	Writing for Social Change	
WRIT 400 [WI]	Writing for -- and about -- the Web [*]	
WRIT 405	Internship in Publishing	
WRIT T280	Special Topics in Writing	
WRIT T380	Special Topics in Writing	

WRIT T480	Special Topics in Writing	
WRIT 401	Advanced Poetry Workshop	
Total Credits		24.0

* Courses marked with an asterisk are also listed as options for the 4th required course for the minor. A student who elects to take one of these courses may not count it twice (once as a required course and once as an elective). For example, a student who chooses to take ANTH 350, "Anthropology of Language," as a required course may not take it again as one of the electives; however, this student could take PHIL 305, "Ethics and the Media," as an elective.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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Certificate in Ethical Theory and Practice

Only available to currently enrolled Drexel students.

The Certificate in Ethical Theory and Practice exemplifies Drexel's commitment to engaged education and the Philosophy Program's emphasis on the inter-involvement of theory and practice. In our family, civic, work, and professional lives, we are confronted with issues of conduct and choices about what to do, what to create, how to move through the world and what kind of persons to be. This Certificate reflects each student's potential to move through the world as a positive and constructive force no matter what field of endeavor he or she may pursue.

Admission Requirements

Open to Drexel students in all schools and colleges, in all majors who have completed fifteen credits.

Program Requirements

Required Courses

PHIL 101	Introduction to Western Philosophy	3.0
or PHIL 102	Introduction to Eastern Philosophy	
PHIL 105	Critical Reasoning	3.0
PHIL 241	Social & Political Philosophy	3.0
PHIL 251	Ethics	3.0

Select two of the following:		6.0
PHIL 301	Business Ethics	
PHIL 305	Ethics and the Media	
PHIL 311	Ethics and Information Technology	
PHIL 315	Engineering Ethics	
PHIL 317	Ethics and Design Professions	
PHIL 321	Biomedical Ethics	
PHIL 322	Ethics of Human Enhancement	
PHIL 323	Organizational Ethics	
PHIL 325	Ethics in Sports Management	
PHIL 330	Criminal Justice Ethics	
PHIL 335	Global Ethical Issues	
PHIL 340	Environmental Ethics	
PHIL 385	Philosophy of Law	
Total Credits		18.0

Certificate in Interfaith and Religious Studies

Only available to currently enrolled Drexel students.

The Certificate in Interfaith and Religious Studies represents Drexel University's commitment to the study of spirituality and the contribution of the world's organized religions to the psychological and social well-being of individuals, groups, and societies. Through the study of the interrelationship of religions and the efforts of interfaith initiatives, students will better understand group commonalities and differences and attempts for social improvement and the resolution of conflict.

The Judaic Studies Program, an interdepartmental and interdisciplinary program in the College of Arts and Sciences, has for many years taught about the centrality of religion in cultural life. In its core courses, the evolution of Judaism alongside the rise of Christianity and Islam, has been studied. As the coordinating body for the new Certificate in Interfaith and Religious Studies, the Judaic Studies Program continues its tradition of exposing Drexel students to the leaders, thinkers, and institutions of the larger, outside community.

Program Requirements

Students must complete at least 15 credits from the list below:		15.0
JUDA 117	Introduction to World Religions	
or ANTH 11	Introduction to World Religions	
JUDA 221	Anthropology of Interfaith Relations	
or ANTH 217	Anthropology of Interfaith Relations	
JUDA 222	Comparative Religious Ethics	
or ANTH 27	Comparative Religious Ethics	
JUDA 223	Coexistence and Conflict: Jews, Christians, and Muslims in the Early Mediterranean	
or HIST 260	Coexistence and Conflict: Jews, Christians, and Muslims in the Early Mediterranean	
JUDA 224	Judaism and Christianity: Two Religions or One?	
or PHIL 291	Judaism and Christianity: Two Religions or One?	
JUDA 225	Philosophy of Religion	
or PHIL 391	Philosophy of Religion	
Total Credits		15.0

Any travel-add-on component to these courses can be counted towards the Certificate.

Certificate in Medical Humanities

The Certificate Program in Medical Humanities is designed for students majoring in any of the biological sciences, health professions including biomedical engineering, nursing and public health, the humanities, and the social sciences, with the aim of promoting dialogue and mutual appreciation for various approaches to health related issues.

The wide range of applicable courses within designated disciplines fosters an interdisciplinary context for investigating the many challenges within medicine and caregiving. This format, in turn, encourages students to explore illness, disability, dying, and healing as *human* experiences and to evaluate some of the limitations of an exclusively scientific perspective on medical practice and research.

A three credit introductory seminar (HUM 315) and a three credit concluding Capstone Seminar (ENGL 470) further provide intellectual cohesiveness and a sense of community among students enrolled in the program. Both co-directors of the program will help students choose courses best suited for their personal and professional interests. Note that most courses applicable to the program also fulfill humanities electives for other majors and that courses may change as departments offer more options.

Opportunities

Those students who successfully complete the program will receive a certificate in medical humanities. This certificate highlights the student's proficiency in an interdisciplinary approach to health related issues not easily attainable through isolated courses.

Additional information

For additional information, contact the program directors:

Edward "Ted" Fristrom, PhD
Department of English and Philosophy
College of Arts and Sciences, Drexel University
ecf35@drexel.edu

Stacey Ake, PHD (biology), PHD (philosophy)
Department of English and Philosophy
College of Arts and Sciences, Drexel University
sea29@drexel.edu

Required Courses

HUM 315	Perspectives in Medical Humanities	3.0
ENGL 470	Capstone Seminar in Medical Humanities	3.0
Select one of the following literature courses:		3.0
ENGL 360 [WI]	Literature and Society (Portrayals of Mental Disorders)	
ENGL 370	Topics in Literature and Medicine (Illness and Healing in Literature)	
ENGL 370	Topics in Literature and Medicine (The Physician in Literature and Film)	
ENGL 370	Topics in Literature and Medicine (Health Matters in Drama)	
Select one of the following philosophy courses:		3.0
PHIL 251	Ethics	
PHIL 321	Biomedical Ethics	
PHIL 355	Philosophy of Medicine	
PHIL 361	Philosophy of Science	
Select two courses from the following:		6.0
AFAS T380	Special Topics in Africana Studies (Race, Disease, and History)	
AFAS T380	Special Topics in Africana Studies (HIV/Aids in Africa)	
ANTH 210 [WI]	Worldview: Science, Religion and Magic	

ANTH 220	Aging In Cross-Cultural Perspective	
ARTH 320	Art in the Age of Technology	
ARTH 465	Special Topics in Art History	
BIO 212	Biotechnology	
BMES 338	Biomedical Ethics and Law	
ENVS 321	Environmental Health	
HIST 280	History of Science: Ancient to Medieval	
HIST 285	Technology in Historical Perspective	
PSY 242	Psychology of Disability	
PSY 244	Culture and Personality	
PSY 252	Death and Dying	
PSY 356	Women's Health Psychology	
SOC 120	Sociology of the Family	
SOC 125	Sociology of Aging	
SOC 225	Sociology of Technology & Aging	
SOC 235	Sociology of Health and Illness	
Total Credits		**18.0**

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Philosophy, Arts, and Humanities Certificate

Only available to currently enrolled Drexel students.

The Certificate in Philosophy, Arts, and Humanities provides an excellent opportunity for undergraduate students in all majors to deepen and broaden their educational experience through engagement with questions and ideas related to the arts and the humanities. What is the nature of art and how is it related to ideas about "beauty?" How do interpretations contribute to our idea of what is true? How can competing interpretations be assessed and evaluated? These and many other related issues will be explored.

Required Courses

PHIL 101	Introduction to Western Philosophy	3.0
or PHIL 102	Introduction to Eastern Philosophy	
PHIL 105	Critical Reasoning	3.0
or PHIL 107	Philosophy and Knowledge Organization	
PHIL 231	Aesthetics: Philosophy of Art	3.0

Select three of the following:		9.0
PHIL 212	Ancient Philosophy	
or PHIL 214	Modern Philosophy	
or PHIL 215	Contemporary Philosophy	
PHIL 381 [WI]	Philosophy in Literature	
PHIL 385	Philosophy of Law	
PHIL 391	Philosophy of Religion	
Total Credits		18.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Philosophy, Science, and Technology Certificate

Only available to currently enrolled Drexel students.

The Certificate in Philosophy, Science and Technology provides an excellent opportunity for undergraduate students in all majors to deepen and broaden their educational experience by enhancing and exercising their philosophical skills in relation to some of the most central issues and ideas related to science and technology. What is the nature and scope of natural science? How do the sciences produce knowledge? Is technology a neutral factor in human life and history? What is our responsibility to the environment? These and many other questions will be explored.

Program Requirements

Required Courses

PHIL 101	Introduction to Western Philosophy	3.0
PHIL 111	Symbolic Logic I	3.0
or PHIL 107	Philosophy and Knowledge Organization	
Select one of the following:		3.0
PHIL 207	Symbolic Logic II	
PHIL 216	Philosophy of Time	
PHIL 218	Philosophy of Mathematics	
PHIL 221	Epistemology: Philosophy of Knowledge	
Select three of the following:		9.0
PHIL 341	Environmental Philosophy	
PHIL 351	Philosophy of Technology	
PHIL 355	Philosophy of Medicine	

PHIL 361	Philosophy of Science	
Total Credits		18.0

Certificate in Writing and Publishing

About the Program

The certificate in writing and publishing (CWP) offers currently enrolled Drexel University students the opportunity for both professional and personal development through a combination of available courses in professional writing, creative writing and publishing. The certificate enhances employment opportunities, opening a broad range of professional choices in cooperative employment and in the post-degree job market as skills are acquired. The CWP improves on-the-job performance, as the student develops writing skills and associated professional knowledge.

The program develops core competencies through the synergy of writing and publishing courses. The courses develop the student's skills in writing and publishing both through theory and practical application.

General requirements

The certificate in writing and publishing allows students to achieve certification in one or more of the following tracks:

- professional writing and publishing
- creative writing and publishing
- comprehensive writing and publishing (no longer accepting new students)

Each track requires the completion of a minimum of six courses (18.0 credits). Tracks can be designed to meet the professional needs and personal interests of the individual student.

Working with an advisor, students will choose not only the track but the courses within the track to develop an individually tailored program. Students can choose courses that will meet the general requirements of the program, while also satisfying their own professional and personal requirements.

Those students who have successfully completed this program will receive a certificate in writing and publishing. The transcript will indicate the completion of the CWP. This certification will indicate proficiency in written communication and familiarity with techniques in publishing in a variety of venues. The certificate program in writing and publishing highlights the student's acquisition of skills more than they would be in a list of courses on a transcript.

The completion of the certificate demonstrates the student's commitment to writing and publishing skills. It highlights writing skills of students majoring in business and technical areas; similarly, for students in the humanities and social sciences, it certifies writing and publishing skills, either in creative writing or professional writing.

Students meet with one of the two program co-directors to determine their track:

Harriet Levin Millan
Director, Certificate in Writing and Publishing
harriet.levin.millan@drexel.edu

Henry Israeli

Associate Director, Certificate in Writing and Publishing
hpi22@drexel.edu

Track Requirements

The professional writing and publishing track offers three options: business communication and publishing; technical communication and publishing; and journalism. This track is useful for business majors or students in technical or science areas who want to highlight their acquisition of writing skills. For students majoring in the humanities it provides an opportunity to develop areas of writing and publishing competencies in the professional arena. The creative writing and publishing track, is useful to all students as it encourages personal and professional development through creative writing and a knowledge of publishing. The comprehensive track is no longer accepting new students.

Note: Many majors already require one or more of the courses leading to the certificate in writing and publishing or list these courses as recommended electives

Professional Writing and Publishing Track

18.0 quarter credits

The professional writing and publishing track is useful for business majors or students in technical or science areas who want to highlight their acquisition of writing skills. For students majoring in the humanities it provides an opportunity to develop areas of writing and publishing competencies in the professional arena.

This track offers three focus options:

- business communication and publishing: for students interested in a career in business.
- technical communication and publishing: for students interested in engineering, science, information science and technology and careers in higher education.
- journalism: for students interested in global journalism and international affairs.

Business Communication and Publishing

Required Courses

COM 270 [WI]	Business Communication	3.0
COM 350 [WI]	Document Design and Evaluation	3.0
or COM 375	Grant Writing	
or WRIT 312	Writing for Target Audiences	
Select one of the following:		3.0
COM 320 [WI]	Science Writing	
COM 420	Technical, Science and Health Editing	
COM T380	Special Topics in Communication Theory	
VSCM 480 [WI]	Graphic Design Seminar: Design Perceptions	
Select one of the following:		3.0
COM 335	Digital Publishing	
COM 340	Desktop Publishing	
VSCM 479	Graphic Design Seminar: Advanced Media (Bookmaking)	
WRIT 310	Literary Editing & Publication	
WRIT 400 [WI]	Writing for -- and about -- the Web	
Select two of the following:		6.0
COM 160	Introduction to Journalism	
COM 315	Investigative Journalism	
COM 390 [WI]	Global Journalism	
CULA 412	Food Writing	
HNRS 301	Colloquium II *	

WRIT 210 [WI]	The Peer Reader in Context	
WRIT 220 [WI]	Creative Nonfiction Writing	
WRIT 225 [WI]	Creative Writing	
WRIT 301 [WI]	Writing Poetry	
WRIT 302 [WI]	Writing Fiction	
WRIT 303	Writing Humor and Comedy	
WRIT 306	Writing About the Media	
WRIT 312 [WI]	Writing for Target Audiences	
WRIT T380	Special Topics in Writing	
Total Credits		18.0

*   By Director's permission only.

Technical Communication and Publishing

Required Courses

COM 310 [WI]	Technical Communication	3.0
COM 375 [WI]	Grant Writing	3.0
or WRIT 312	Writing for Target Audiences	
Select one of the following:		3.0
COM 320 [WI]	Science Writing	
COM 350 [WI]	Document Design and Evaluation	
COM 420	Technical, Science and Health Editing	
COM T380	Special Topics in Communication Theory	
VSCM 480 [WI]	Graphic Design Seminar: Design Perceptions	
Select one of the following:		3.0
COM 335	Digital Publishing	
COM 340	Desktop Publishing	
VSCM 479	Graphic Design Seminar: Advanced Media (Bookmaking)	
WRIT 310	Literary Editing & Publication	
WRIT 400 [WI]	Writing for -- and about -- the Web	
Select any two additional Certificate in Writing and Publishing courses, including but not limited to the following:		6.0
COM 160	Introduction to Journalism	
COM 315	Investigative Journalism	
COM 390 [WI]	Global Journalism	
CULA 412	Food Writing	
HNRS 301	Colloquium II *	
WRIT 210 [WI]	The Peer Reader in Context	
WRIT 220 [WI]	Creative Nonfiction Writing	
WRIT 301 [WI]	Writing Poetry	
WRIT 302 [WI]	Writing Fiction	
WRIT 303	Writing Humor and Comedy	
WRIT 306	Writing About the Media	
WRIT 312 [WI]	Writing for Target Audiences	
WRIT T380	Special Topics in Writing	
Total Credits		18.0

*   By Director's permission only.

Journalism

Required Courses

COM 160	Introduction to Journalism	3.0
Select two of the following:		6.0
COM 261	Advanced Journalism	
COM 315	Investigative Journalism	
COM 390 [WI]	Global Journalism	
Select one of the following:		3.0
COM 335	Digital Publishing	
COM 340	Desktop Publishing	
WRIT 310	Literary Editing & Publication	
WRIT 400 [WI]	Writing for -- and about -- the Web	

Select any two additional Certificate in Writing and Publishing courses, including but not limited to the following:		6.0
COM 270 [WI]	Business Communication	
or COM 310	Technical Communication	
COM 320 [WI]	Science Writing	
COM 375 [WI]	Grant Writing	
COM 420	Technical, Science and Health Editing	
CULA 412	Food Writing	
HNRS 301	Colloquium II [*]	
VSCM 479	Graphic Design Seminar: Advanced Media (Bookmaking)	
VSCM 480 [WI]	Graphic Design Seminar: Design Perceptions	
WRIT 210 [WI]	The Peer Reader in Context	
WRIT 220 [WI]	Creative Nonfiction Writing	
WRIT 225 [WI]	Creative Writing	
WRIT 301 [WI]	Writing Poetry	
WRIT 302 [WI]	Writing Fiction	
WRIT 303	Writing Humor and Comedy	
WRIT 306	Writing About the Media	
WRIT 312 [WI]	Writing for Target Audiences	
WRIT T380	Special Topics in Writing	
Total Credits		18.0

[*]   By Director's permission only.

Creative Writing and Publishing track

18.0 quarter credits

This track is designed for students who want to develop their creative writing skills either for personal development and expression, or because they recognize that creative writing develops imagination; sharpens clarity of expression; and enhances sensitivity to other people. Creative writing is a good pre-professional concentration for pre-law, pre-med, and the social sciences. The importance of creative writing has been recognized for engineering and for business.

Select three of the following (one of which must be a 200-level course):		9.0
WRIT 220 [WI]	Creative Nonfiction Writing	
WRIT 225 [WI]	Creative Writing	
WRIT 301 [WI]	Writing Poetry	
WRIT 302 [WI]	Writing Fiction	
WRIT 303	Writing Humor and Comedy	
WRIT 306	Writing About the Media	
WRIT T380	Special Topics in Writing	
Select one of the following:		3.0
COM 335	Digital Publishing	
COM 340	Desktop Publishing	
COM 350 [WI]	Document Design and Evaluation	
VSCM 479	Graphic Design Seminar: Advanced Media (Bookmaking)	
WRIT 310	Literary Editing & Publication	
WRIT 400 [WI]	Writing for -- and about -- the Web	
WRIT 405	Internship in Publishing [*]	
Select any two additional Certificate in Writing and Publishing courses, including but not limited to the following:		6.0
COM 160	Introduction to Journalism	
COM 261	Advanced Journalism	
COM 270 [WI]	Business Communication	
COM 310 [WI]	Technical Communication	
COM 315	Investigative Journalism	
COM 320 [WI]	Science Writing	
COM 350 [WI]	Document Design and Evaluation	
COM 375 [WI]	Grant Writing	

COM 390 [WI]	Global Journalism	
COM 420	Technical, Science and Health Editing	
CULA 412	Food Writing	
HNRS 301	Colloquium II [**]	
VSCM 480 [WI]	Graphic Design Seminar: Design Perceptions	
WRIT 210 [WI]	The Peer Reader in Context	
WRIT 312 [WI]	Writing for Target Audiences	
Total Credits		18.0

[*]   WRIT 405 must be taken twice if no other publishing course is taken.

[**]   By Director's permission only.

Entertainment Writing and Publishing Track

18.0 quarter credits

Entertainment Writing and Publishing is designed for students in any major who want to highlight their acquisition of writing skills. For students majoring in any entertainment field it provides an opportunity to develop areas of writing and publishing competencies in the professional entertainment field.

The track is designed for students who want to pursue writing either for personal development and expression as a personal or creative pursuit or profession. The Entertainment Writing and Publishing track will give students a strong multidisciplinary introduction to writing for a variety of entertainment professions including screenwriting, sports journalism, food writing, game writing, grant writing, and more. This track is designed for both students already studying any of the entertainment fields (such as Entertainment and Arts Management), as well as other students who are interested in exploring the field.

General Requirements		
WRIT 306	Writing About the Media	3.0
or WRIT 226	Writing in Public Spaces	
WRIT 312 [WI]	Writing for Target Audiences	3.0
or COM 375	Grant Writing	
Select two of the following		**6.0**
COM 265	Audio Journalism	
COM 305	Sports Journalism	
CULA 412	Food Writing	
DSMR 315 [WI]	Media Merchandising I	
ENGL 323	Literature and Other Arts	
HNRS 301	Colloquium II [**]	
SCRP 270 [WI]	Screenwriting I	
SCRP 241	Writing TV Comedy	
SCRP 242	Writing TV Drama	
SCRP 260	Writing Comics	
SCRP 280 [WI]	Writing the Short Film	
SCRP 290	Game: Universe & Story	
WRIT 303	Writing Humor and Comedy	
Select One of the Following		**3.0**
COM 335	Digital Publishing	
COM 340	Desktop Publishing	
VSCM 479	Graphic Design Seminar: Advanced Media ((Bookmaking))	
WRIT 310	Literary Editing & Publication	
WRIT 400 [WI]	Writing for -- and about -- the Web	
WRIT 405	Internship in Publishing [*]	
Select one of the following		**3.0**
COM 160	Introduction to Journalism	

COM 270 [WI]	Business Communication	
COM 420	Technical, Science and Health Editing	
WRIT 210 [WI]	The Peer Reader in Context	
WRIT 220 [WI]	Creative Nonfiction Writing	
WRIT 225 [WI]	Creative Writing	
WRIT 301 [WI]	Writing Poetry	
WRIT 302 [WI]	Writing Fiction	
COM 320 [WI]	Science Writing	
VSCM 480 [WI]	Graphic Design Seminar: Design Perceptions	
WRIT T380	Special Topics in Writing	
Total Credits		18.0

* WRIT 405 must be taken twice if no other publishing course is taken.

** By Director's permission only.

Comprehensive Certificate track

18.0 quarter credits

The Comprehensive Track is designed for students whose majors and minors include writing courses (either as electives or required courses) and whose schedules allow for the additional credits to obtain certification.

Select two of the following:		6.0
COM 335	Digital Publishing	
COM 340	Desktop Publishing	
VSCM 479	Graphic Design Seminar: Advanced Media	
WRIT 310	Literary Editing & Publication	
WRIT 400 [WI]	Writing for -- and about -- the Web	
WRIT 405	Internship in Publishing *	
Select two of the following: **		12.0
Creative Writing		
Track A		
WRIT 220 [WI]	Creative Nonfiction Writing	
Any 300-level writing (WRIT) course		
Track B		
WRIT 225 [WI]	Creative Writing	
Any 300-level writing (WRIT) course		
Professional Writing		
Track A		
COM 310 [WI]	Technical Communication	
COM 420	Technical, Science and Health Editing	
or COM 375	Grant Writing	
or VSCM 480	Graphic Design Seminar: Design Perceptions	
Track B		
COM 270 [WI]	Business Communication	
COM 375 [WI]	Grant Writing	
or COM 350	Document Design and Evaluation	
or VSCM 48	Graphic Design Seminar: Design Perceptions	
Journalism		
COM 160	Introduction to Journalism	3.0
Select one of the following:		
COM 315	Investigative Journalism	
COM 390 [WI]	Global Journalism	
CULA 412	Food Writing	
WRIT 210 [WI]	The Peer Reader in Context ***	
Total Credits		21.0

* WRIT 405 Must be taken twice.

** Students select two of the following course sequences from at least two different categories

*** By Director's permission only.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Intermediate Arabic Proficiency Certificate

The Intermediate Arabic Proficiency Certificate* offers students a language certificate at the intermediate level as proof that they are sufficiently proficient** to interact with native speakers in a basic everyday context and within standard cultural norms, whether abroad or in the United States.

Please note that this certificate is available only to currently matriculated Drexel students.

Program Requirements

The Intermediate Arabic Proficiency Certificate* offers students a language certificate at the intermediate level as proof that they are sufficiently proficient** to interact with native speakers in a basic everyday context and within standard cultural norms, whether abroad or in the United States.

The Intermediate Arabic Certificate requires a minimum of 8.0 credits*** including the successful completion of the required course, ARBC 202. Students can choose from the following courses:		8.0--20.0
ARBC 101	Arabic I	
ARBC 102	Arabic II	
ARBC 103	Arabic III	
ARBC 201	Arabic IV	
ARBC 202	Arabic V	
ARBC 310	Advanced Writing and Speaking	
Total Credits		8.0-20.0

* Only students who place at or below the ARBC 202 level are eligible for the Intermediate Arabic Proficiency Certificate.

** The proficiency certificate is based on standardized outcomes set by the American Council on the Teaching of Foreign Languages (ACTFL, actfl.org (https://www.actfl.org/)).

*** Demonstrated proficiency through Drexel's placement test in ARBC 101, ARBC 102, ARBC 103, and/or ARBC 201 may reduce the number of required credits to a minimum of 8.0. (Note that completion of placement test[s] do not count toward academic credit.)
The required credits for the certificate is determined by placement level:
*For students who place into:
101 – 20 credits
102 – 16 credits
103 – 12 credits
201 – 8 credits
202 – 8 credits (student has to take 310 as well)
**Students who place above 202 are encouraged to pursue a language minor.

Intermediate Chinese Proficiency Certificate

The Intermediate Chinese Proficiency Certificate* offers students a language certificate at the intermediate level as proof that they are sufficiently proficient** to interact with native speakers in a basic everyday context and within standard cultural norms, whether abroad or in the United States.

Please note that this certificate is available only to currently matriculated Drexel students.

Program Requirements

The Intermediate Chinese Proficiency Certificate* offers students a language certificate at the intermediate level as proof that they are sufficiently proficient to interact with native speakers in a basic everyday context and within standard cultural norms, whether abroad or in the United States.**

The Intermediate Chinese Certificate requires a minimum of 8 credits*** including the successful completion of the required course, CHIN 202. Students can choose from the following courses:		8.0-20.0
CHIN 101	Chinese I	
CHIN 102	Chinese II	
CHIN 103	Chinese III	
CHIN 201	Chinese IV	
CHIN 202	Chinese V	
CHIN 310	Advanced Writing and Speaking	
Total Credits		8.0-20.0

* Only students who place at or below CHIN 202 level are eligible for the Intermediate Chinese Proficiency Certificate.

** The proficiency certificate is based on standardized outcomes set by the American Council on the Teaching of Foreign Languages (ACTFL, actfl.org (https://www.actfl.org/)).

*** Demonstrated proficiency through Drexel's placement test in CHIN 101, CHIN 102, CHIN 103, and/or CHIN 201 may reduce the number of required credits to a minimum of 8.0. (Note that completion of placement test[s] do not count toward academic credit.)
The required credits for the certificate is determined by placement level:
*For students who place into:
101 – 20 credits
102 – 16 credits
103 – 12 credits
201 – 8 credits
202 – 8 credits (student has to take 310 as well)
**Students who place above 202 are encouraged to pursue a language minor.

Intermediate French Proficiency Certificate

The Intermediate French Proficiency Certificate* offers students a language certificate at the intermediate level as proof that they are sufficiently proficient** to interact with native speakers in a basic everyday context and within standard cultural norms, whether abroad or in the United States.

Please note that this certificate is available only to currently matriculated Drexel students.

Program Requirements

The Intermediate French Proficiency Certificate* offers students a language certificate at the intermediate level as proof that they are sufficiently proficient to interact with native speakers in a basic everyday context and within standard cultural norms, whether abroad or in the United States.**

The Intermediate French Certificate requires a minimum of 8-20 credits*** including the successful completion of the required course, FREN 202. Students can choose from the following courses:		8.0-20.0
FREN 101	French I	
FREN 102	French II	
FREN 103	French III	
FREN 201	French IV	
FREN 202	French V	
FREN 310	Advanced Writing and Speaking	
Total Credits		8.0-20.0

* Only students who place at or below the FREN 202 level are eligible for the Intermediate French Proficiency Certificate.

** The proficiency certificate is based on standardized outcomes set by the American Council on the Teaching of Foreign Languages (ACTFL, actfl.org (https://www.actfl.org/))

*** Demonstrated proficiency through Drexel's placement test in FREN 101, FREN 102, FREN 103, and/or FREN 201 may reduce the number of required credits to a minimum of 8.0. (Note that completion of placement test[s] do not count toward academic credit.)

The required credits for the certificate is determined by placement level:

*For students who place into:

101 – 20 credits

102 – 16 credits

103 – 12 credits

201 – 8 credits

202 – 8 credits (student has to take 310 as well)

**Students who place above 202 are encouraged to pursue a language minor.

Intermediate German Proficiency Certificate

The Intermediate German Proficiency Certificate* offers students a language certificate at the intermediate level as proof that they are sufficiently proficient** to interact with native speakers in a basic everyday context and within standard cultural norms, whether abroad or in the United States.

Please note that this certificate is available only to currently matriculated Drexel students.

Program Requirements

The Intermediate German Proficiency Certificate* offers students a language certificate at the intermediate level as proof that they are sufficiently proficient to interact with native speakers in a basic everyday context and within standard cultural norms, whether abroad or in the United States.**

The Intermediate German Certificate requires a minimum of 8-20 credits*** including the successful completion of the required course, GER 202. Students can choose from the following courses:		8.0-20.0
GER 101	German I	
GER 102	German II	
GER 103	German III	
GER 201	German IV	
GER 202	German V	
GER 310	Advanced Writing and Speaking	
Total Credits		8.0-20.0

* Only students who place at or below the GER 202 level are eligible for the Intermediate German Proficiency Certificate.

** The proficiency certificate is based on standardized outcomes set by the American Council on the Teaching of Foreign Languages (ACTFL, actfl.org (https://www.actfl.org/)).

*** Demonstrated proficiency through Drexel's placement test in GER 101, GER 102, GER 103, and/or GER 201 may reduce the number of required credits to a minimum of 8.0. (Note that completion of placement test[s] do not count toward academic credit.)

The required credits for the certificate is determined by placement level:

*For students who place into:

101 – 20 credits

102 – 16 credits

103 – 12 credits

201 – 8 credits

202 – 8 credits (student has to take 310 as well)

**Students who place above 202 are encouraged to pursue a language minor.

Intermediate Hebrew Proficiency Certificate

Effective March 15, 2020, students will no longer be accepted into this Intermediate Proficiency Certificate.

The Intermediate Hebrew Proficiency Certificate* offers students a language certificate at the intermediate level as proof that they are sufficiently proficient** to interact with native speakers in a basic everyday context and within standard cultural norms, whether abroad or in the United States.

Please note that this certificate is available only to currently matriculated Drexel students.

Program Requirements

The Intermediate Hebrew Proficiency Certificate* offers students a language certificate at the intermediate level as proof that they are sufficiently proficient to interact with native speakers in a basic everyday context and within standard cultural norms, whether abroad or in the United States.**

The Intermediate Hebrew Certificate requires a minimum of 8-20 credits*** including the successful completion of the required course HBRW 202. Students can choose from the following courses:		8.0-20.0
HBRW 101	Introduction to Hebrew I	
HBRW 102	Introduction to Hebrew II	
HBRW 103	Introduction to Hebrew III	
HBRW 201	Hebrew IV	
HBRW 202	Hebrew V	
HBRW 310	Advanced Writing and Speaking	
Total Credits		8.0-20.0

* Only students who place at or below the HBRW 202 level are eligible for the Intermediate Hebrew Proficiency Certificate.

** The proficiency certificate is based on standardized outcomes set by the American Council on the Teaching of Foreign Languages (ACTFL, actfl.org (https://www.actfl.org/)).

*** Demonstrated proficiency through Drexel's placement test in HBRW 101, HBRW 102,HBRW 103, and/or HBRW 201 may reduce reduce the number of required credits to a minimum of 8.0. (Note that completion of placement test[s] do not count toward academic credit.) The required credits for the certificate is determined by placement level:

*For students who place into:

101 – 20 credits

102 – 16 credits

103 – 12 credits

201 – 8 credits

202 – 8 credits (student has to take 310 as well)

**Students who place above 202 are encouraged to pursue a language minor.

Intermediate Italian Proficiency Certificate

Effective March 15, 2020, students will no longer be accepted into this Intermediate Proficiency Certificate.

The Intermediate Italian Proficiency Certificate* offers students a language certificate at the intermediate level as proof that they are sufficiently proficient** to interact with native speakers in a basic everyday context and within standard cultural norms, whether abroad or in the United States.

Please note that this certificate is available only to currently matriculated Drexel students.

Program Requirements

The Intermediate Italian Proficiency Certificate* offers students a language certificate at the intermediate level as proof that they are sufficiently proficient to interact with native speakers in a basic everyday context and within standard cultural norms, whether abroad or in the United States.**

The Intermediate Italian Certificate requires a minimum of 8-20 credits*** including the successful completion of the required course, ITAL 202. Students can choose from the following courses:		8.0-20.0
ITAL 101	Italian I	
ITAL 102	Italian II	
ITAL 103	Italian III	
ITAL 201	Italian IV	
ITAL 202	Italian V	
ITAL 310	Advanced Writing and Speaking	
Total Credits		8.0-20.0

* Only students who place at or below the ITAL 202 level are eligible for the Intermediate Italian Proficiency Certificate.

** The proficiency certificate is based on standardized outcomes set by the American Council on the Teaching of Foreign Languages (ACTFL, actfl.org (https://www.actfl.org/)).

*** Demonstrated proficiency through Drexel's placement test in ITAL 101, ITAL 102, ITAL 103, and/or ITAL 201 may reduce reduce the number of required credits to a minimum of 8.0. (Note that completion of placement test[s] do not count toward academic credit.) The required credits for the certificate is determined by placement level:

*For students who place into:

101 – 20 credits

102 – 16 credits

103 – 12 credits

201 – 8 credits

202 – 8 credits (student has to take 310 as well)

**Students who place above 202 are encouraged to pursue a language minor.

Intermediate Japanese Proficiency Certificate

The Intermediate Japanese Proficiency Certificate* offers students a language certificate at the intermediate level as proof that they are sufficiently proficient** to interact with native speakers in a basic everyday context and within standard cultural norms, whether abroad or in the United States.

Please note that this certificate is available only to currently matriculated Drexel students.

Program Requirements

The Intermediate Japanese Proficiency Certificate* offers students a language certificate at the intermediate level as proof that they are sufficiently proficient to interact with native speakers in a basic everyday context and within standard cultural norms, whether abroad or in the United States.**

The Intermediate Japanese Certificate requires a minimum of 8--20 credits*** including the successful completion of the required course, JAPN 202. Students can choose from the following courses:		8.0-20.0
JAPN 101	Japanese I	
JAPN 102	Japanese II	
JAPN 103	Japanese III	
JAPN 201	Japanese IV	
JAPN 202	Japanese V	
JAPN 310	Advanced Writing and Speaking	
Total Credits		8.0-20.0

* Only students who place at or below the JAPN 202 level are eligible for the Intermediate Japanese Proficiency Certificate.

** The proficiency certificate is based on standardized outcomes set by the American Council on the Teaching of Foreign Languages (ACTFL, actfl.org (https://www.actfl.org/)).

*** Demonstrated proficiency through Drexel's placement test in JAPN 101, JAPN 102, JAPN 103, and/or JAPN 201 may reduce the number of required credits to a minimum of 8.0. (Note that completion of placement test[s] do not count toward academic credit.)

The required credits for the certificate is determined by placement level:

*For students who place into:

101 – 20 credits

102 – 16 credits

103 – 12 credits

201 – 8 credits

202 – 8 credits (student has to take 310 as well)

**Students who place above 202 are encouraged to pursue a language minor.

Intermediate Korean Proficiency Certificate

The Intermediate Korean Proficiency Certificate* offers students a language certificate at the intermediate level as proof that they are sufficiently proficient** to interact with native speakers in a basic everyday context and within standard cultural norms, whether abroad or in the United States.

Please note that this certificate is available only to currently matriculated Drexel students.

Program Requirements

The Intermediate Korean Proficiency Certificate* offers students a language certificate at the intermediate level as proof that they are sufficiently proficient to interact with native speakers in a basic everyday context and within standard cultural norms, whether abroad or in the United States.**

The Intermediate Korean Certificate requires a minimum of 8-20 credits*** including the successful completion of the required course, KOR 202. Students can choose from the following courses:		8.0-20.0
KOR 101	Korean I	
KOR 102	Korean II	
KOR 103	Korean III	
KOR 201	Korean IV	
KOR 202	Korean V	
KOR 310	Advanced Writing & Speaking	
Total Credits		8.0-20.0

* Only students who place at or below the KOR 202 level are eligible for the Intermediate Korean Proficiency Certificate.

** The proficiency certificate is based on standardized outcomes set by the American Council on the Teaching of Foreign Languages (ACTFL, actfl.org (https://www.actfl.org/)).

*** Demonstrated proficiency through Drexel's placement test in KOR 101, KOR 102, KOR 103, and/or KOR 201 may reduce the number of required credits to a minimum of 8.0. (Note that completion of placement test[s] do not count toward academic credit.)

The required credits for the certificate is determined by placement level:

*For students who place into:

101 – 20 credits

102 – 16 credits

103 – 12 credits

201 – 8 credits

202 – 8 credits (student has to take 310 as well)

**Students who place above 202 are encouraged to pursue a language minor.

Intermediate Spanish Proficiency Certificate

The Intermediate Spanish Proficiency Certificate* offers students a language certificate at the intermediate level as proof that they are sufficiently proficient** to interact with native speakers in a basic everyday context and within standard cultural norms, whether abroad or in the United States.

Please note that this certificate is available only to currently matriculated Drexel students.

Program Requirements

The Intermediate Spanish Proficiency Certificate* offers students a language certificate at the intermediate level as proof that they are sufficiently proficient to interact with native speakers in a basic everyday context and within standard cultural norms, whether abroad or in the United States.**

The Intermediate Spanish Certificate requires a minimum of 8-20 credits*** including the successful completion of the required course, SPAN 202. Students can choose from the following courses:		8.0-20.0
SPAN 101	Spanish I	
SPAN 102	Spanish II	
SPAN 103	Spanish III	
SPAN 201	Spanish IV	
SPAN 202	Spanish V	
SPAN 310	Advanced Writing and Speaking	
Total Credits		8.0-20.0

* Only students who place at or below the SPAN 202 level are eligible for the Intermediate Spanish Proficiency Certificate.

** The proficiency certificate is based on standardized outcomes set by the American Council on the Teaching of Foreign Languages (ACTFL, actfl.org (https://www.actfl.org/)).

*** Demonstrated proficiency through Drexel's placement test in
      SPAN 101, SPAN 102, SPAN 103, and/or SPAN 201 may reduce the
      number of required credits to a minimum of 8.0. (Note that completion
      of placement test[s] do not count toward academic credit.)
      The required credits for the certificate is determined by placement
      level:
      *For students who place into:
      101 – 20 credits
      102 – 16 credits
      103 – 12 credits
      201 – 8 credits
      202 – 8 credits (student has to take 310 as well)
      **Students who place above 202 are encouraged to pursue a
      language minor.

College of Computing & Informatics

From our position on the leading edge of information and technology, Drexel University's College of Computing & Informatics (CCI) instills the knowledge and skills necessary for our students to lead and innovate across industries in a rapidly evolving technological landscape.

Building on Drexel University's exceptional foundation of entrepreneurship and cooperative education, we provide unparalleled professional experiences and the on-the-job training that is vital to preparing today's students for tomorrow's world. At CCI, our unique structure bringing computing and informatics together under one roof in a dynamic, collaborative college allows us to spot trends before they emerge, to solve problems before they occur, and to build a better tomorrow, starting today.

The College contributes to theory and practice along dimensions that include technical, human, organizational, policy and societal considerations. This broad perspective positions the College to address the complex, multi-disciplinary problems that are increasingly common as society becomes more dependent on information technology.

The academic programs of the College provide broad and deep coverage of computing & informatics. For more information about the College, please visit the College's website (http://www.drexel.edu/cci/).

Majors

- Computer Science (BACS, BSCS) (p. 171)
  - Computer Security Concentration (p. 182)
  - Game Programming and Development Concentration (p. 184)
- Computing and Security Technology (BSCST) (p. 185)
- Data Science (BSDS) (p. 192)
- Information Systems (BSIS) (p. 197)
- Software Engineering (BSSE) (p. 204)

Minors

- Computer Science (p. 210)
- Computing Technology (p. 211)
- Data Science (p. 211)
- Human Computer Interaction (p. 211)
- Information Systems (p. 212)
- Security Technology (p. 212)
- Software Engineering (p. 212)

About the College

The College of Computing & Informatics (http://www.drexel.edu/cci/) (CCI) offers a number of undergraduate degrees in computer science, computing & security technology, data science, information systems, and software engineering. The degree programs are open to freshmen and transfers from other departments at Drexel and other universities. Students have access to the computing facilities available to all Drexel students.

The College educates professionals through its interdisciplinary programs to meet a wide range of needs in the computing and informatics fields to benefit all sectors of society.

Transfer admission for traditional undergraduate programs occurs in the fall term only due to the sequence of required courses. Internal transfer students can be admitted at any term. Admission to the BS online completion program in computing & security technology is offered on a rolling basis. Please contact an undergraduate advisor (https://drexel.edu/cci/current-students/undergraduate/advising/) for more information.

Cooperative Education

Cooperative education emphasizes career management through experiential learning as an integral part of the education process. The co-op is based on employment in practical, major-related positions consistent with the interests, abilities, and aptitudes of the students.

For more general information on Drexel University's co-op opportunities, visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/).

Computer Science

Major: Computer Science
Degree Awarded: Bachelor of Science in Computer Science (BSCS) or Bachelor of Arts in Computer Science (BACS)
Calendar Type: Quarter
Total Credit Hours: 186.5
Co-op Options: Three Co-op (Five years); One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 11.0701
Standard Occupational Classification (SOC) code: 11-3021; 15-1111; 15-1131; 15-1132; 11-1199

About the Program

The College of Computing & Informatics' Bachelor of Science/Arts in Computer Science offers extensive exposure and hands-on practice in the core areas of the field, including programming paradigms and languages, algorithms, systems, networking, and software engineering. Students also select upper level tracks in areas such as artificial intelligence, security, graphics and vision, and human-computer interaction. The program's flexibility allows students to easily sample from areas in which they would like to apply their computing knowledge. This hands-on curriculum combined with co-op provides real-world experience that culminates in a full-year software project.

The programs of study in computer science are designed with the flexibility to prepare students for careers in a rapidly changing profession and to allow strong preparation for graduate education in the field. In addition to the courses in the major, the Bachelor of Science program emphasizes foundation courses in the sciences and in applied mathematics, leading to careers involving applications in science and engineering. The Bachelor of Arts degree emphasizes foundation courses in the humanities and the social sciences, leading to careers involving applications in those areas.

Core courses in all programs include programming and data structures, programming language concepts, computer systems architecture, and software methodology and engineering. Students also choose two other tracks from a list of possible specializations. Please contact your advisor (https://drexel.edu/cci/current-students/undergraduate/advising/) at the College of Computing & Informatics for a current list of computer science track and elective courses.

Concentrations

- Computer Security (p. 182)
- Game Programming and Development (p. 184)

Additional Information

For more information about this program, please visit the BS/BA in Computer Science web page (https://drexel.edu/cci/academics/undergraduate-programs/bsba-computer-science/) on the College of Computing & Informatics' website.

Degree Requirements (BS)

The Bachelor of Science (BS) in Computer Science program emphasizes foundation courses in the sciences and in applied mathematics, leading to careers involving applications in science and engineering.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Computer Science Requirements		
CS 164	Introduction to Computer Science	3.0
CS 171	Computer Programming I	3.0
or CS 175	Advanced Computer Programming I	
CS 172	Computer Programming II	3.0
or CS 176	Advanced Computer Programming II	
CS 260	Data Structures	3.0
CS 265	Advanced Programming Tools and Techniques	3.0
CS 270	Mathematical Foundations of Computer Science	3.0
CS 277	Algorithms and Analysis	3.0
CS 281	Systems Architecture	4.0
CS 283	Systems Programming	3.0
CS 360	Programming Language Concepts	3.0
SE 181	Introduction to Software Engineering and Development	3.0
SE 310	Software Architecture I	3.0
Computer Science track courses (see below)		18.0
Computer Science electives (see below)		6.0
Computing & Informatics Requirements		
CI 101	Computing and Informatics Design I	2.0
CI 102	Computing and Informatics Design II	2.0
CI 103	Computing and Informatics Design III	2.0
CI 491 [WI]	Senior Project I	3.0
CI 492 [WI]	Senior Project II	3.0
CI 493 [WI]	Senior Project III	3.0
Mathematics Requirements		
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
MATH 200	Multivariate Calculus	4.0
MATH 201	Linear Algebra	4.0
MATH 221	Discrete Mathematics	3.0
MATH 311	Probability and Statistics I	4.0
Science Requirements		**19.0**
Select one of the following lab science sequences:		
BIO 122	Cells and Genetics	
& BIO 124	and Evolution & Organismal Diversity	
& BIO 126	and Physiology and Ecology	
Or		
CHEM 101	General Chemistry I	
& CHEM 102	and General Chemistry II	
& CHEM 103	and General Chemistry III	

Or		
PHYS 101	Fundamentals of Physics I	
& PHYS 102	and Fundamentals of Physics II	
& PHYS 201	and Fundamentals of Physics III	
Science electives (see below)		
Arts & Humanities Requirements		
COM 230	Techniques of Speaking	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 311	Ethics and Information Technology	3.0
Writing & Communication electives (see below)		6.0
Arts & Humanities, Business, or Social Studies electives (see below) [*]		18.0
University Requirements		
UNIV CI101	The Drexel Experience	2.0
or CI 120	CCI Transfer Student Seminar	
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
Free electives		**22.5**
Total Credits		186.5

[*]   At least 3.0 credit must be taken from a Business category course (see below) and at least 3.0 credits must be from a Social Studies category course (see below)

Program Electives

Independent study courses and special topics courses must be approved by the department prior to enrollment to satisfy a program elective requirement.

- **Computer Science electives**: any CS course numbered 300 or higher
- **Science electives**: any CHEM (except CHEM 111, CHEM 112, CHEM 113, CHEM 114, CHEM 151), BIO (except BIO 161, BIO 162, BIO 163; can take only one of BIO 100, BIO 107, BIO 122; can take only one of BIO 101, BIO 109, BIO 124), PHYS (except PHYS 050, PHYS 100,PHYS 103, PHYS 104, PHYS 105, PHYS 106 [WI] , PHYS 121, PHYS 122, PHYS 151, PHYS 160, PHYS 305, PHYS 324,PHYS 405; cannot take both PHYS 131 & PHYS 181), ENVS, ENSS, PHEV
- **Writing & Communications electives**: any WRIT, COM, ENGL courses officially certified as Writing Intensive (http://drexel.edu/engphil/about/DrexelWritingCenter/wiCourses/course_list/) (WI), SCRP 270 [WI] and SCRP 275
- **Business electives**: any ACCT, BLAW, BUSN, ECON, ENTP, FIN, HRMT, INTB, MGMT, MIS, MKTG, OPM, OPR, ORGB, STAT, TAX
- **Social Studies electives**: any AFAS, ANTH, GST, HIST, JUDA, PSCI, PSY (except PSY 332, PSY 337), SOC, WGST
- **Arts & Humanities electives**: any ARCH, ARTH, CMGT, CJS, COM, CULA, DANC, EDEX, EDUC, ENGL (except ENGL 101, ENGL 102, ENGL 103, ENGL 105, ENGL 111, ENGL 112, ENGL 113), ESTM, FASH, FMST, FMVD, GST, INTR, LING, MUSC, PHIL, PHTO, THTR, VSCM, VSST, WRIT, Foreign Language courses (http://www.drexel.edu/culturecomm/academics/undergraduate/modernlang/languages/) as defined by the College of Arts and Sciences, and GMAP 260, ANIM 140, ANIM 141, ANIM 211, ANIM 212

Computer Science Tracks

Students must complete two of the following Computer Science tracks for a total of 18.0 credits. The tracks may overlap by one course. Students should check with the College for any additional Special Topics courses being offered that may be appropriate for one of the tracks. The student may propose a Student Defined Track with departmental approval.

Algorithms and Data Structures

CS 440	Theory of Computation	3.0
CS 457	Data Structures and Algorithms I	3.0
CS 458	Data Structures and Algorithms II	3.0

Artificial Intelligence

Select three of the following:		9.0
CS 380	Artificial Intelligence	
CS 383	Machine Learning	
CS 385	Evolutionary Computing	
CS 387	Game AI Development	
CS 481	Advanced Artificial Intelligence	

Computer and Network Security

Select three of the following:		9.0
CS 303	Algorithmic Number Theory and Cryptography	
CS 377	Software Security	
CS 472	Computer Networks: Theory, Applications and Programming	
CS 475	Computer and Network Security	

Computer Architecture

Select three of the following:		9.0
CS 352	Processor Architecture & Analysis	
CS 476	High Performance Computing	
ECEC 356	Embedded Systems	
ECEC 413	Introduction to Parallel Computer Architecture	

Computer Graphics and Vision

Select three of the following:		9.0
CS 430	Computer Graphics	
CS 431	Advanced Rendering Techniques	
CS 432	Interactive Computer Graphics	
CS 435	Computational Photography	

Computing Systems

Select three of following:		9.0
CS 314	Computing in the Small	
CS 352	Processor Architecture & Analysis	
CS 361	Concurrent Programming	
CS 365	System Administration	
CS 370	Operating Systems	
CS 375	Web and Mobile App Development	
CS 441	Compiler Workshop I	
CS 461	Database Systems	
CS 472	Computer Networks: Theory, Applications and Programming	

Game Development and Design

Select three of the following:		9.0
CS 341	Serious Game Development	
or CS 342	Experimental Game Development	
CS 345	Computer Game Design and Development	
CS 387	Game AI Development	
CS 445	Topics in Computer Gaming	
GMAP 377	Game Development: Workshop I	
GMAP 378	Game Development: Workshop II	

Graphics and Interaction

Select three of the following:		9.0
CS 338	Graphical User Interfaces	
CS 341	Serious Game Development	
or CS 342	Experimental Game Development	
CS 345	Computer Game Design and Development	
CS 387	Game AI Development	
CS 430	Computer Graphics	
CS 431	Advanced Rendering Techniques	
CS 432	Interactive Computer Graphics	
CS 435	Computational Photography	
CS 445	Topics in Computer Gaming	
GMAP 377	Game Development: Workshop I	
GMAP 378	Game Development: Workshop II	
INFO 310	Human-Centered Design Process & Methods	
or PSY 337	Human-Computer Interaction	

Human-Computer Interaction

Select three of the following:		9.0
CS 338	Graphical User Interfaces	
CS 345	Computer Game Design and Development	
CS 432	Interactive Computer Graphics	
INFO 310	Human-Centered Design Process & Methods	
or PSY 337	Human-Computer Interaction	

Intelligent Systems

Select three courses from the following:		9.0
CS 380	Artificial Intelligence	
CS 383	Machine Learning	
CS 385	Evolutionary Computing	
CS 387	Game AI Development	
CS 430	Computer Graphics	
CS 431	Advanced Rendering Techniques	
CS 432	Interactive Computer Graphics	
CS 435	Computational Photography	
CS 481	Advanced Artificial Intelligence	

Numeric and Symbolic Computation

Select three of the following:		9.0
CS 300	Applied Symbolic Computation	
CS 303	Algorithmic Number Theory and Cryptography	
MATH 300	Numerical Analysis I	
MATH 301	Numerical Analysis II	
MATH 305	Introduction to Optimization Theory	

Programming Languages

CS 440	Theory of Computation	3.0
CS 441	Compiler Workshop I	3.0
CS 442	Compiler Workshop II	3.0

Software and Security

Select three of the following:		9.0
CS 303	Algorithmic Number Theory and Cryptography	
CS 377	Software Security	
CS 472	Computer Networks: Theory, Applications and Programming	
CS 475	Computer and Network Security	
SE 311	Software Architecture II	
SE 320	Software Verification and Validation	
SE 410	Software Evolution	

Software Engineering

SE 311	Software Architecture II	3.0
SE 320	Software Verification and Validation	3.0
SE 410	Software Evolution	3.0

Systems and High-Performance Computing

Select three of the following:		9.0
CS 314	Computing in the Small	
CS 352	Processor Architecture & Analysis	
CS 361	Concurrent Programming	
CS 365	System Administration	
CS 370	Operating Systems	
CS 375	Web and Mobile App Development	
CS 440	Theory of Computation	

CS 441	Compiler Workshop I	
CS 442	Compiler Workshop II	
CS 461	Database Systems	
CS 472	Computer Networks: Theory, Applications and Programming	
CS 476	High Performance Computing	
ECEC 356	Embedded Systems	
ECEC 413	Introduction to Parallel Computer Architecture	
Theory and Computation		
Select three of the following:		9.0
CS 300	Applied Symbolic Computation	
CS 303	Algorithmic Number Theory and Cryptography	
CS 440	Theory of Computation	
CS 441	Compiler Workshop I	
CS 442	Compiler Workshop II	
CS 457	Data Structures and Algorithms I	
CS 458	Data Structures and Algorithms II	
MATH 300	Numerical Analysis I	
MATH 301	Numerical Analysis II	
MATH 305	Introduction to Optimization Theory	

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Degree Requirements (BA)

The Bachelor of Arts (BA) in Computer Science program emphasizes foundation courses in the humanities and the social sciences, leading to careers involving applications in those areas.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Computer Science Requirements		
CS 164	Introduction to Computer Science	3.0
CS 171	Computer Programming I	3.0
or CS 175	Advanced Computer Programming I	
CS 172	Computer Programming II	3.0
or CS 176	Advanced Computer Programming II	
CS 260	Data Structures	3.0
CS 265	Advanced Programming Tools and Techniques	3.0
CS 270	Mathematical Foundations of Computer Science	3.0

CS 277	Algorithms and Analysis	3.0
CS 281	Systems Architecture	4.0
CS 283	Systems Programming	3.0
CS 360	Programming Language Concepts	3.0
SE 181	Introduction to Software Engineering and Development	3.0
SE 310	Software Architecture I	3.0
Computer Science track courses (see below)		18.0
Computer Science electives (see below)		6.0
Computing & Informatics Requirements		
CI 101	Computing and Informatics Design I	2.0
CI 102	Computing and Informatics Design II	2.0
CI 103	Computing and Informatics Design III	2.0
CI 491 [WI]	Senior Project I	3.0
CI 492 [WI]	Senior Project II	3.0
CI 493 [WI]	Senior Project III	3.0
Mathematics Requirements		
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
MATH 200	Multivariate Calculus	4.0
MATH 201	Linear Algebra	4.0
MATH 221	Discrete Mathematics	3.0
MATH 311	Probability and Statistics I	4.0
Science Requirements		**18.0**
Select one of the following lab science sequences plus science electives from below:		
BIO 122	Cells and Genetics	
& BIO 124	and Evolution & Organismal Diversity	
& BIO 126	and Physiology and Ecology	
CHEM 101	General Chemistry I	
& CHEM 102	and General Chemistry II	
& CHEM 103	and General Chemistry III	
PHYS 101	Fundamentals of Physics I	
& PHYS 102	and Fundamentals of Physics II	
& PHYS 201	and Fundamentals of Physics III	
Arts & Humanities Requirements		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 311	Ethics and Information Technology	3.0
COM 230	Techniques of Speaking	3.0
Arts Humanities, Business, or Social Studies electives (see below)		6.0
Disciplinary Minor		**24.0**
University Requirements		
UNIV CI101	The Drexel Experience	2.0
or CI 120	CCI Transfer Student Seminar	
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
Free electives		**17.5**
Total Credits		186.5

Program Electives

Independent study courses and special topics courses must be approved by the department prior to enrollment to satisfy a program elective requirement.

- **Computer Science electives**: any CS course numbered 300 or higher

- **Science electives**: any CHEM (except CHEM 111, CHEM 112, CHEM 113, CHEM 114, CHEM 151), BIO (except BIO 161, BIO 162, BIO 163; can take only one of BIO 100, BIO 107, BIO 122; can take only one of BIO 101, BIO 109, BIO 124), PHYS (except PHYS 050, PHYS 100, PHYS 103, PHYS 104, PHYS 105, PHYS 106 [WI] , PHYS 121, PHYS 122,PHYS 151, PHYS 160, PHYS 305, PHYS 324, PHYS 405; cannot take both PHYS 131 & PHYS 181); ENVS, ENSS, PHEV
- **Social Studies electives**: any AFAS, ANTH, GST, HIST, JUDA, PSCI, PSY (except PSY 332, PSY 337), SOC, WGST
- **Arts & Humanities electives**: any ARCH, ARTH, CMGT, CJS, COM, CULA, DANC, EDEX, EDUC, ENGL (except ENGL 101, ENGL 102, ENGL 103, ENGL 111,ENGL 112,ENGL 113), ESTM, FASH, FMST, FMVD, GST, INTR, LING, MUSC, PHIL, PHTO, THTR, VSCM, VSST, WRIT, Foreign Language courses (http://www.drexel.edu/culturecomm/academics/undergraduate/modernlang/languages/) as defined by the College of Arts and Sciences, and GMAP 260, ANIM 140, ANIM 141, ANIM 211, ANIM 212
- **Business electives:** any ACCT, BLAW, BUSN, ECON, ENTP, FIN, HRMT, INTB, MGMT, MIS, MKTG, OPM, OPR, ORGB, STAT, TAX

Computer Science Tracks

Students must complete two of the following Computer Science tracks for a total of 18.0 credits. The tracks may overlap by one course. Students should check with the College for any additional Special Topics courses being offered that may be appropriate for one of the tracks. The student may propose a Student Defined Track with departmental approval.

Algorithms and Data Structures

CS 440	Theory of Computation	3.0
CS 457	Data Structures and Algorithms I	3.0
CS 458	Data Structures and Algorithms II	3.0

Artificial Intelligence

Select three of the following:		9.0
CS 380	Artificial Intelligence	
CS 383	Machine Learning	
CS 385	Evolutionary Computing	
CS 387	Game AI Development	
CS 481	Advanced Artificial Intelligence	

Computer and Network Security

Select three of the following:		9.0
CS 303	Algorithmic Number Theory and Cryptography	
CS 377	Software Security	
CS 472	Computer Networks: Theory, Applications and Programming	
CS 475	Computer and Network Security	

Computer Architecture

Select three of the following:		9.0
CS 352	Processor Architecture & Analysis	
CS 476	High Performance Computing	
ECEC 356	Embedded Systems	
ECEC 413	Introduction to Parallel Computer Architecture	

Computer Graphics and Vision

Select three of the following:		9.0
CS 430	Computer Graphics	
CS 431	Advanced Rendering Techniques	
CS 432	Interactive Computer Graphics	
CS 435	Computational Photography	

Computing Systems

Select three of the following:		9.0
CS 314	Computing in the Small	
CS 352	Processor Architecture & Analysis	
CS 361	Concurrent Programming	
CS 365	System Administration	
CS 370	Operating Systems	
CS 375	Web and Mobile App Development	
CS 441	Compiler Workshop I	
CS 461	Database Systems	
CS 472	Computer Networks: Theory, Applications and Programming	

Game Development and Design

Select three of the following:		9.0
CS 341	Serious Game Development	
or CS 342	Experimental Game Development	
CS 345	Computer Game Design and Development	
CS 387	Game AI Development	
CS 445	Topics in Computer Gaming	
GMAP 377	Game Development: Workshop I	
GMAP 378	Game Development: Workshop II	

Graphics and Interaction

Select three of the following:		9.0
CS 338	Graphical User Interfaces	
CS 341	Serious Game Development	
or CS 342	Experimental Game Development	
CS 345	Computer Game Design and Development	
CS 387	Game AI Development	
CS 430	Computer Graphics	
CS 431	Advanced Rendering Techniques	
CS 432	Interactive Computer Graphics	
CS 435	Computational Photography	
CS 445	Topics in Computer Gaming	
GMAP 377	Game Development: Workshop I	
GMAP 378	Game Development: Workshop II	
INFO 310	Human-Centered Design Process & Methods	
or PSY 337	Human-Computer Interaction	

Human-Computer Interaction

Select three of the following:		9.0
CS 338	Graphical User Interfaces	
CS 345	Computer Game Design and Development	
CS 432	Interactive Computer Graphics	
INFO 310	Human-Centered Design Process & Methods	
or PSY 337	Human-Computer Interaction	

Intelligent Systems

Select three of the following:		9.0
CS 380	Artificial Intelligence	
CS 383	Machine Learning	
CS 385	Evolutionary Computing	
CS 387	Game AI Development	
CS 430	Computer Graphics	
CS 431	Advanced Rendering Techniques	
CS 432	Interactive Computer Graphics	
CS 435	Computational Photography	
CS 481	Advanced Artificial Intelligence	

Numeric and Symbolic Computation

Select three of the following:		9.0
CS 300	Applied Symbolic Computation	
CS 303	Algorithmic Number Theory and Cryptography	
MATH 300	Numerical Analysis I	
MATH 301	Numerical Analysis II	
MATH 305	Introduction to Optimization Theory	

Programming Languages

CS 440	Theory of Computation	3.0
CS 441	Compiler Workshop I	3.0
CS 442	Compiler Workshop II	3.0

Software and Security

Select three of the following:		9.0
CS 303	Algorithmic Number Theory and Cryptography	
CS 377	Software Security	
CS 472	Computer Networks: Theory, Applications and Programming	
CS 475	Computer and Network Security	
SE 311	Software Architecture II	
SE 320	Software Verification and Validation	
SE 410	Software Evolution	
Software Engineering		
SE 311	Software Architecture II	3.0
SE 320	Software Verification and Validation	3.0
SE 410	Software Evolution	3.0
Systems and High-Performance Computing		
Select three of the following:		9.0
CS 314	Computing in the Small	
CS 352	Processor Architecture & Analysis	
CS 361	Concurrent Programming	
CS 365	System Administration	
CS 370	Operating Systems	
CS 375	Web and Mobile App Development	
CS 440	Theory of Computation	
CS 441	Compiler Workshop I	
CS 442	Compiler Workshop II	
CS 461	Database Systems	
CS 472	Computer Networks: Theory, Applications and Programming	
CS 476	High Performance Computing	
ECEC 356	Embedded Systems	
ECEC 413	Introduction to Parallel Computer Architecture	
Theory and Computation		
Select three of the following		9.0
CS 300	Applied Symbolic Computation	
CS 303	Algorithmic Number Theory and Cryptography	
CS 440	Theory of Computation	
CS 441	Compiler Workshop I	
CS 442	Compiler Workshop II	
CS 457	Data Structures and Algorithms I	
CS 458	Data Structures and Algorithms II	
MATH 300	Numerical Analysis I	
MATH 301	Numerical Analysis II	
MATH 305	Introduction to Optimization Theory	

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses

with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study (BS)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

BS Computer Science

5 YR UG Co-op Concentration

Term 1		Credits
CI 101	Computing and Informatics Design I	2.0
CS 164	Introduction to Computer Science	3.0
MATH 121	Calculus I	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
UNIV CI101	The Drexel Experience	1.0
Science lab		4.5
	Term Credits	17.5
Term 2		
CI 102	Computing and Informatics Design II	2.0
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
CS 171 or 175	Computer Programming I Advanced Computer Programming I	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122	Calculus II	4.0
Science lab		4.5
	Term Credits	17.5
Term 3		
CI 103	Computing and Informatics Design III	2.0
CS 172 or 176	Computer Programming II Advanced Computer Programming II	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 123	Calculus III	4.0
UNIV CI101	The Drexel Experience	1.0
Science lab		4.5
	Term Credits	17.5
Term 4		
CS 265	Advanced Programming Tools and Techniques	3.0
CS 270	Mathematical Foundations of Computer Science	3.0
MATH 201	Linear Algebra	4.0
SE 181	Introduction to Software Engineering and Development	3.0
Social Studies elective		3.0
	Term Credits	16.0
Term 5		
CS 260	Data Structures	3.0
MATH 200	Multivariate Calculus	4.0
MATH 221	Discrete Mathematics	3.0
Free elective		3.0
Science elective		3.0
	Term Credits	16.0
Term 6		
COM 230	Techniques of Speaking	3.0
CS 277	Algorithms and Analysis	3.0
CS 281	Systems Architecture	4.0
SE 310	Software Architecture I	3.0

		Credits
Free elective		3.0
	Term Credits	16.0
Term 7		
CS 283	Systems Programming	3.0
CS 360	Programming Language Concepts	3.0
Science elective		3.0
Writing & Communications elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 8		
MATH 311	Probability and Statistics I	4.0
PHIL 311	Ethics and Information Technology	3.0
Computer science electives		6.0
Arts & Humanities elective		3.0
	Term Credits	16.0
Term 9		
Arts & Humanities elective		3.0
Free elective		3.0
Computer Science elective		3.0
Business elective		4.0
Science elective		3.0
	Term Credits	16.0
Term 10		
CI 491 [WI]	Senior Project I	3.0
Arts & Humanities elective		3.0
Computer Science electives		6.0
Free elective		3.0
	Term Credits	15.0
Term 11		
CI 492 [WI]	Senior Project II	3.0
Arts & Humanities elective		3.0
Computer Science electives		6.0
	Term Credits	12.0
Term 12		
CI 493 [WI]	Senior Project III	3.0
Computer Science elective		3.0
Writing & Communications elective		3.0
Free elective		3.0
	Term Credits	12.0

Total Credit: 186.5

Sample Plan of Study (BA)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

5 YR UG Co-op Concentration

Term 1		Credits
CI 101	Computing and Informatics Design I	2.0
CS 164	Introduction to Computer Science	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
MATH 121	Calculus I	4.0
UNIV CI101	The Drexel Experience	1.0
Science lab		4.5
	Term Credits	17.5
Term 2		
CI 102	Computing and Informatics Design II	2.0
CIVC 101	Introduction to Civic Engagement	1.0
CS 171 or 175	Computer Programming I / Advanced Computer Programming I	3.0
COOP 101	Career Management and Professional Development	0.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
MATH 122	Calculus II	4.0
Science lab		4.5
	Term Credits	17.5
Term 3		
CI 103	Computing and Informatics Design III	2.0
CS 172 or 176	Computer Programming II / Advanced Computer Programming II	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
MATH 123	Calculus III	4.0
UNIV CI101	The Drexel Experience	1.0
Science lab		4.5
	Term Credits	17.5
Term 4		
CS 265	Advanced Programming Tools and Techniques	3.0
CS 270	Mathematical Foundations of Computer Science	3.0
MATH 201	Linear Algebra	4.0
SE 181	Introduction to Software Engineering and Development	3.0
Disciplinary Minor elective		3.0
	Term Credits	16.0
Term 5		
CS 260	Data Structures	3.0
MATH 221	Discrete Mathematics	3.0
Disciplinary Minor elective		3.0
Free elective		3.0
Science elective		4.5
	Term Credits	16.5
Term 6		
COM 230	Techniques of Speaking	3.0
CS 277	Algorithms and Analysis	3.0
CS 281	Systems Architecture	4.0
SE 310	Software Architecture I	3.0
Disciplinary Minor elective		3.0
	Term Credits	16.0
Term 7		
CS 283	Systems Programming	3.0
CS 360	Programming Language Concepts	3.0
MATH 200	Multivariate Calculus	4.0
Discplinary Minor elective		3.0
Arts & Humaniries, Business, and Social Studies elective		3.0
	Term Credits	16.0
Term 8		
MATH 311	Probability and Statistics I	4.0
PHIL 311	Ethics and Information Technology	3.0
Computer Science electives		6.0
Disciplinary Minor elective		3.0
	Term Credits	16.0
Term 9		
Arts & Humanities, Business, and Social Studies elective		3.0
Computer Science elective		3.0
Disciplinary Minor elective		6.0
Free elective		3.0
	Term Credits	15.0
Term 10		
CI 491 [WI]	Senior Project I	3.0
Computer Science electives		6.0

Disciplinary Minor elective		3.0
Free elective		2.5
	Term Credits	14.5
Term 11		
CI 492 [WI]	Senior Project II	3.0
Computer Science electives		6.0
Free electives		3.0
	Term Credits	12.0
Term 12		
CI 493 [WI]	Senior Project III	3.0
Computer Science elective		3.0
Free electives		6.0
	Term Credits	12.0

Total Credit: 186.5

Accelerated Degrees

The College of Computing & Informatics offers several Accelerated Degree programs designed to allow students to complete both a bachelor's degree and a graduate degree along with cooperative educational experience in fewer years than would be typical if pursuing the degrees separately. Students accepted in this program can combine any of the College's bachelor's and master's degree programs as well as other options:

- Any CCI BS/any CCI MS Accelerated Degree (BS & MS in five years, including 2 Co-ops)
- Any CCI BS/MBA Accelerated Degree (BS/MBA)
- Any CCI BS/JD Accelerated Degree (BS/JD)

For more information on the criteria for entering this program, visit the BS/MS Accelerated Degree (http://drexel.edu/undergrad/academics/accelerated-degrees/) page on Drexel's website.

Bachelor's/Master's Accelerated Degree in Computer Science

Applying

The guidelines for applying to the Computer Science Bachelor's/Master's (BS/MS) Accelerated Degree Program are as follows:

- University regulations require application after the completion of 90.0 credits but before the completion of 120.0 credits.
- Applicants must have an overall cumulative Grade Point Average of 3.5 or higher.
- Letters of recommendation from two Computer Science faculty are required.
- Students must submit a plan of study. Consult your advisor and course schedules for guidance.
- Applicants must have completed the following courses with a minimum GPA of 3.50

Program Requirements

The courses below should be taken at Drexel. Seek guidance from your advisor regarding additional coursework if any courses below have been taken outside of Drexel.

CS 171	Computer Programming I	3.0
or CS 175	Advanced Computer Programming I	
CS 172	Computer Programming II	3.0
or CS 176	Advanced Computer Programming II	
CS 260	Data Structures	3.0
CS 265	Advanced Programming Tools and Techniques	3.0
CS 270	Mathematical Foundations of Computer Science	3.0
CS 281	Systems Architecture	4.0
MATH 221	Discrete Mathematics	3.0

Requirements

The requirements of the Computer Science BS/MS program follow the requirements of both the BS in Computer Science (http://catalog.drexel.edu/undergraduate/collegeofcomputingandinformatics/computerscience/#requirementsbstext) and the MS in Computer Science (http://catalog.drexel.edu/graduate/collegeofcomputingandinformatics/computerscience/#degreerequirementsmstext). Students must complete all the requirements of the BS in Computer Science (http://catalog.drexel.edu/undergraduate/collegeofcomputingandinformatics/computerscience/#requirementsbstext) except that they may drop two free electives (still maintaining the 180.0 credit minimum for the BS degree). In addition, students must complete 45.0 credits of graduate courses to satisfy the requirements of the MS in Computer Science (http://catalog.drexel.edu/graduate/collegeofcomputingandinformatics/computerscience/#degreerequirementsmstext). Please refer to the linked program pages for the details of these requirements.

When completing undergraduate CS electives and graduate CS courses, students should take care to avoid equivalent courses at both the undergraduate and graduate levels. The table below indicates pairs of equivalent courses; students may only take one or the other in each pair but not both.

CS 338	Graphical User Interfaces	3.0
or CS 530	Developing User Interfaces	
CS 370	Operating Systems	3.0
or CS 543	Operating Systems	
CS 380	Artificial Intelligence	3.0
or CS 510	Introduction to Artificial Intelligence	
CS 430	Computer Graphics	3.0
or CS 536	Computer Graphics	
CS 431	Advanced Rendering Techniques	3.0
or CS 636	Advanced Computer Graphics	
CS 432	Interactive Computer Graphics	3.0
or CS 537	Interactive Computer Graphics	
CS 435	Computational Photography	3.0
or CS 583	Introduction to Computer Vision	
CS 440	Theory of Computation	3.0
or CS 525	Theory of Computation	
CS 457	Data Structures and Algorithms I	3.0
or CS 521	Data Structures and Algorithms I	
CS 458	Data Structures and Algorithms II	3.0
or CS 522	Data Structures and Algorithms II	
CS 472	Computer Networks: Theory, Applications and Programming	3.0
or CS 544	Computer Networks	
CS 475	Computer and Network Security	3.0
or CS 645	Network Security	
CS 481	Advanced Artificial Intelligence	3.0
or CS 610	Advanced Artificial Intelligence	

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic

advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Plan of Study

Students in the BS/MS program typically forego their third co-op and take advanced courses during those two terms. The sample plan of study below thus assumes a total of 14 terms completed within a 5-year period.

Term 1		Credits
CI 101	Computing and Informatics Design I	2.0
CS 164	Introduction to Computer Science	3.0
MATH 121	Calculus I	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
UNIV 101	The Drexel Experience	1.0
Science lab		4.5
	Term Credits	17.5
Term 2		
CI 102	Computing and Informatics Design II	2.0
CS 171 or 175	Computer Programming I / Advanced Computer Programming I	3.0
MATH 122	Calculus II	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
COOP 101	Career Management and Professional Development	0.0
CIVC 101	Introduction to Civic Engagement	1.0
Science lab		4.5
	Term Credits	17.5
Term 3		
CI 103	Computing and Informatics Design III	2.0
CS 172 or 176	Computer Programming II / Advanced Computer Programming II	3.0
MATH 123	Calculus III	4.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
UNIV 101	The Drexel Experience	1.0
Science lab		4.5
	Term Credits	17.5
Term 4		
CS 265	Advanced Programming Tools and Techniques	3.0
CS 270	Mathematical Foundations of Computer Science	3.0
MATH 201	Linear Algebra	4.0
Science elective		3.0
Social Studies elective		3.0
	Term Credits	16.0
Term 5		
CS 260	Data Structures	3.0
CS 275	Web and Mobile App Development	3.0
MATH 221	Discrete Mathematics	3.0

Science elective		3.0
Business elective		4.0
	Term Credits	16.0
Term 6		
CS 281	Systems Architecture	4.0
CS 350	Software Design	3.0
COM 230	Techniques of Speaking	3.0
Science elective		3.0
Arts & Humanities elective		3.0
	Term Credits	16.0
Term 7		
CS 283	Systems Programming	3.0
CS 360	Programming Language Concepts	3.0
Science elective		3.0
Writing & Communications elective		3.0
Arts & Humanities elective		3.0
Free elective		3.0
	Term Credits	18.0
Term 8		
Computer Science electives		6.0
MATH 410 or 311	Scientific Data Analysis I / Probability and Statistics I	3.0
PHIL 311	Ethics and Information Technology	3.0
Arts & Humanities elective		3.0
Writing & Communications elective		3.0
	Term Credits	18.0
Term 9		
CS 451	Software Engineering	3.0
Computer Science electives		6.0
Mathematics elective		3.0
Science elective		3.0
Arts & Humanities elective		3.0
	Term Credits	18.0
Term 10		
Computer Science electives		6.0
Arts & Humanities elective		3.0
Graduate course		3.0
Graduate course		3.0
	Term Credits	15.0
Term 11		
Computer Science electives		6.0
Arts & Humanities elective		3.0
Graduate course		3.0
Graduate course		3.0
	Term Credits	15.0
Term 12		
CI 491 [WI]	Senior Project I	3.0
Graduate course		3.0
Graduate course		3.0
Graduate course		3.0
Graduate course		3.0
	Term Credits	15.0
Term 13		
CI 492 [WI]	Senior Project II	3.0
Graduate course		3.0
Graduate course		3.0
Graduate course		3.0
Graduate course		3.0
	Term Credits	15.0
Term 14		
CI 493 [WI]	Senior Project III	3.0

Graduate course	3.0
Graduate course	3.0
Graduate course	3.0
Term Credits	12.0

Total Credit: 226.5

Co-op/Career Opportunities

Co-Op Options

Three co-op options are available for this program:

- 5-year/3 co-op
- 4-year/1 co-op
- Accelerated Degree (BS & MS): 5-year/2 co-op

Career Opportunities

The demand for computing skills is tremendous and growing, with highly paid jobs. Most professionals in the field focus on the design and development of software and software-based applications. Typical jobs include software engineer, programmer, web designer, multimedia or software developer, systems analyst or consultant, manager of technical staff, client-server architect, network designer, and database specialist. Most positions require at least a bachelor's degree. Relevant work experience, such as that provided by co-operative education, is also very important, as cited by the Occupational Outlook Handbook (http://www.bls.gov/ooh/) published by the US Bureau of Labor Statistics.

Job titles of recent computer science graduates include:

- Web Developer
- Software Systems Engineer
- Software Developer
- Network Engineer
- Application Analyst

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

3675 Market Street

In March 2019, the College of Computing & Informatics relocated to 3675 Market (https://drexel.edu/cci/about/our-facilities/). For the first time in the College's history, all CCI faculty, students and professional staff are housed under one roof. Occupying two floors in the brand new uCity Square building, CCI's new home offers state-of-the-art technology in our classrooms, labs, meeting areas and collaboration spaces. 3675 Market offers Class A laboratory, office, coworking, and convening spaces. In fall 2019, the College will open a third floor which will include additional offices, classrooms, a research lab, a maker space, and a ground-breaking DXC Technology Innovation Lab. Located at the intersection of Market Street and 37th Street, 3675 Market will act as a physical nexus, bridging academic campuses and medical centers to the east and south, the commercial corridors along Market Street and Chestnut Street, and the residential communities to the north and west.

The uCity Square building offers:

- Speculative lab/office space
- World-class facilities operated by CIC (https://cic.us/philadelphia/)
- Café/restaurant on-site

- Quorum, a two-story, 15K SF convening space and conference center
- Adjacent to future public square
- Access to Science Center's nationally renowned business acceleration and technology commercialization programs

Drexel University Libraries

Drexel University Libraries (http://www.library.drexel.edu/) is a learning enterprise, advancing the University's academic mission through serving as educators, supporting education and research, collaborating with researchers, and fostering intentional learning outside of the classroom. Drexel University Libraries engages with Drexel communities through three physical locations, including W. W. Hagerty Library, Queen Lane Library, and the Library Learning Terrace, as well as a vibrant online presence which sees, on average, over 8,000 visits per day. In the W.W. Hagerty Library location, College of Computing & Informatics students have access to private study rooms and nearly half a million books, periodicals, DVDs, videos and University Archives. All fields of inquiry are covered, including: library and information science, computer science, software engineering, health informatics, information systems, and computing technology. Resources are available online at library.drexel.edu (http://www.library.drexel.edu/) or in-person at W. W. Hagerty Library (http://www.library.drexel.edu/locations/).

The Libraries also make available laptop and desktop PC and Mac computers, printers and scanners, spaces for quiet work or group projects and designated 24/7 spaces. Librarians and library staff—including a liaison librarian for computing and informatics—are available for individual research consultations and to answer questions about materials or services.

CCI Commons

Located on the 10th floor of 3675 Market Street, the CCI Commons is an open lab and collaborative work environment for students. It features desktop computers, a wireless/laptop area, free black and white printing, and more collaborative space for its students. Students have access to 3675 Market's fully equipped conference room with 42" displays and videoconferencing capabilities. The CCI Commons provides technical support to students, faculty, and professional staff. In addition, the staff provides audio-visual support for all presentation classrooms within 3675 Market. Use of the CCI Commons is reserved for all students taking CCI courses.

The computers for general use are Microsoft Windows and Macintosh OSX machines with appropriate applications which include the Microsoft Office suite, various database management systems, modeling tools, and statistical analysis software. Library related resources may be accessed at the CCI Commons and through the W.W. Hagerty Library. The College is a member of the Rational SEED Program which provides cutting-edge software development and project management software for usage in the CCI Commons and CCI classrooms. The College is also a member of the Microsoft Academic Alliance known also as "DreamSpark" that allows students free access to a wide array of Microsoft software titles and operating systems.

The CCI Commons, student labs, and classrooms have access to networked databases, print and file resources within the College, and the Internet via the University's network. Email accounts, Internet and BannerWeb access are available through the Office of Information Resources and Technology.

CCI Learning Center

The CCI Learning Center (CCILC), located in 3675 Market Street's CCI Commons student computer lab, provides consulting and other learning resources for students taking computer science classes. The CCILC is staffed by graduate and undergraduate computer science students from the College of Computing & Informatics.

The CCILC and CCI Commons serve as a central hub for small group work, student meetings, and TA assistance.

Research Laboratories

The College houses multiple research labs, led by CCI faculty, in 3675 Market Street including: the Drexel Health and Risk Communication Lab, Interactive Systems for Healthcare, Socio-Technical Studies Group, Intelligent Information & Knowledge Computing Research Lab, Evidence-based Decision Making Lab, Applied Symbolic Computation Laboratory (ASYM), High Performance Computing Laboratory (SPIRAL), Drexel Research on Play (RePlay) Laboratory, Software Engineering Research Group (SERG), Social Computing Research Group, Vision and Cognition Laboratory (VisCog) and the Vision and Graphics Laboratory. For more information on these laboratories, please visit the College's research web page (http://cci.drexel.edu/research.aspx).

Evaluations

The College of Computing & Informatics works continually to improve its degree programs. As part of this effort, the Computer Science degree is evaluated relative to the following Objectives and Outcomes.

Computer Science Program Educational Objectives

Drexel Computer Science alumni will:

a. be valued employees in a wide variety of occupations in industry, government and academia, in particular as computer scientists and software engineers;

b. succeed in graduate and professional studies, such as engineering, science, law, medicine and business;

c. pursue life-long learning and professional development to remain current in an ever changing technological world;

d. provide leadership in their profession, in their communities, and society;

e. function as responsible members of society with an awareness of the social and ethical ramifications of their work.

Computer Science Student Outcomes (for Bachelor of Science and Bachelor of Arts)

The Drexel Computer Science program enables students to attain, by the time of graduation:

a. An ability to apply knowledge of computing and mathematics appropriate to the discipline

b. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution

c. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs

d. An ability to function effectively on teams to accomplish a common goal

e. An understanding of professional, ethical, legal, security and social issues and responsibilities

f. An ability to communicate effectively with a range of audiences

g. An ability to analyze the local and global impact of computing on individuals, organizations, and society

h. Recognition of the need for and an ability to engage in continuing professional development

i. An ability to use current techniques, skills, and tools necessary for computing practice

j. An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

k. An ability to apply design and development principles in the construction of software systems of varying complexity.

Additional Information

The Computer Science BS program is accredited by the Computing Accreditation Commission (CAC) of ABET, http://www.abet.org.

To view the latest BS/BA in Computer Science program enrollment numbers, please click here (https://drexel.edu/cci/academics/undergraduate-programs/facts/).

Computer Science Faculty

Yuan An, PhD *(University of Toronto, Canada) Director of International Programs.* Associate Professor. Conceptual modeling, schema and ontology mapping, information integration, knowledge representation, requirements engineering, healthcare information systems, semantic web.

David Augenblick, MS *(University of Pennsylvania).* Associate Teaching Professor. Introductory and object-oriented programming, data structures and database systems, computer application project management, application of computer programming principles and solutions to engineering problems.

Marcello Balduccini, PhD *(Texas Tech University) Senior Research Scientist, Applied Informatics Group.* Associate Research Professor. Logic programming, declarative programming, answer set programming, knowledge representation, various types of reasoning

M. Brian Blake, PhD *(George Mason University) Executive Vice President for Academic Affairs and Provost; Distinguished Professor of Systems and Software Engineering; Joint Appointments with the College of Engineering and the College of Medicine.* Software engineering approaches for integration of Web-based systems.

Mark Boady, PhD *(Drexel University).* Assistant Teaching Professor. Computer Algebra, complex symbolic calculations, automation of computation problems

David E. Breen, PhD *(Rensselaer Polytechnic Institute).* Associate Professor. Self-organization, biomedical image/video analysis, biological simulation, geometric modeling and visualization

Matthew Burlick, PhD *(Stevens Institute of Technology).* Assistant Teaching Professor. Image processing, machine learning, real-time video tracking, object detection and classification, statistics/probability, and acoustics

Yuanfang Cai, PhD *(University of Virginia)*. Associate Professor. Formal software design modeling and analysis, software economics, software evolution and modularity.

Bruce W. Char, PhD *(University of California-Berkeley)*. Professor. Symbolic mathematical computation, algorithms and systems for computer algebra, problem-solving environments parallel and distributed computation.

Christopher Geib, PhD *(University of Edinburgh)*. Associate Professor. Decision making and reasoning under conditions of uncertainty, planning, scheduling, constraint, based reasoning, human computer and robot interaction, probabilistic reasoning, computer network security, large scale process control, user interfaces.

Colin Gordon, PhD *(University of Washington)*. Assistant Professor. Software reliability, program behavior, concurrent and systems-level code, formal assurance, programming models, distributed computing, even testing

Jeremy R. Johnson, PhD *(Ohio State University)*. Professor. Computer algebra; parallel computations; algebraic algorithms; scientific computing.

Constantine Katsinis, PhD *(University of Rhode Island)*. Teaching Professor. High-performance computer networks, parallel computer architectures with sustained teraflops performance, computer security, image processing.

Geoffrey Mainland, PhD *(Harvard University)*. Assistant Professor. High-level programming languages and runtime support for non-general purpose computation.

Spiros Mancoridis, PhD *(University of Toronto) The Auerbach Berger Chair in Cybersecurity Distinguished Professor of Computer Science*. Professor. Software engineering; software security; code analysis; evolutionary computation.

Adelaida Alban Medlock, MS *(Drexel University)*. Associate Teaching Professor. Introductory programming; computer science education.

William Mongan, MS *(Drexel University) Associate Department Head for Undergraduate Affairs, Computer Science*. Associate Teaching Professor. Service-oriented architectures, program comprehension, reverse engineering, software engineering, computer architecture, computer science education, engineering education outreach

Ko Nishino, PhD *(University of Tokyo) Associate Department Head for Graduate Affairs, Computer Science*. Professor. Computer vision, computer graphics, analysis and synthesis of visual appearance.

Krzysztof Nowak, PhD *(Washington University)*. Associate Teaching Professor. Fourier analysis, partial differential equations, image processing, wavelets, asymptotic distribution of eigenvalues, numerical methods and algorithms, computer science education.

Santiago Ontañón, PhD *(University of Barcelona)*. Assistant Professor. Game AI, computer games, artificial intelligence, machine learning, case-based reasoning

Jeffrey L. Popyack, PhD *(University of Virginia)*. Professor. Operations research, stochastic optimization, computational methods of Markov decision processes; artificial intelligence, computer science education.

Jeffrey Salvage, MS *(Drexel University)*. Teaching Professor. Object-oriented programming, multi-agent systems, software engineering, database theory, introductory programming, data structures.

Dario Salvucci, PhD *(Carnegie Mellon University) Department Head, Computer Science*. Professor. Human computer interaction, cognitive science, machine learning, applications for driving.

Kurt Schmidt, MS *(Drexel University)*. Associate Teaching Professor. Data structures, math foundations for computer science, programming tools, programming languages.

Ali Shokoufandeh, PhD *(Rutgers University) Senior Associate Dean of Research*. Professor. Theory of algorithms, graph theory, combinational optimization, computer vision.

Erin Solovey, PhD *(Tufts University)*. Assistant Professor. Human-computer interaction, brain-computer interfaces, tangible interaction, machine learning, human interaction with complex and autonomous systems.

Julia Stoyanovich, PhD *(Columbia University)*. Assistant Professor. Data and knowledge management, big data, biological data management, search and ranking.

Brian Stuart, PhD *(Purdue University)*. Associate Teaching Professor. Machine learning, networking, robotics, image processing, simulation, interpreters, data storage, operating systems, computer science, data communications, distributed/operating systems, accelerated computer programming, computer graphics.

Filippos Vokolos, PhD *(Polytechnic University)*. Assistant Teaching Professor. System architecture, principles of software design and construction, verification and validation methods for the development of large software systems, foundations of software engineering, software verification & validation, software design, programming languages, dependable software systems.

Emeritus Faculty

Valerie Ann Yonker, PhD *(Drexel University)*. Associate Teaching Professor Emerita. Human service information systems, systems analysis and design, measurement in software evaluation, knowledge engineering.

Computer Science

Computer Security Concentration

The Computer Science concentration in Computer Security is designed to supply graduates with the skills needed to prepare them for a wide range of opportunities. It gives students the ability to design and implement computing security and privacy processes, software and systems. Students use mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of such systems.

Computer security specialists are needed who can work within cyberspace to help secure, defend against, respond to, and in some instance, even initiate preemptive attacks. These individuals must have detailed knowledge of the systems they protect, an understanding of the cyber-environment and physical environment in which they operate, and an understanding of the ethical expectations and legal surroundings of their field.

Additional Information

For more information about this concentration, visit the College of Computing & Informatics (https://drexel.edu/cci/academics/undergraduate-programs/bsba-computer-science/)' web site.

Computer Security Concentration Program Requirements

Students in the Computer Security Concentration should follow the below concentration requirements in addition to the core degree requirements for the BS in Computer Science program (p. 172). For any questions regarding your plan of study, please contact your Undergraduate Advisor (https://drexel.edu/cci/current-students/undergraduate/advising/).

The concentration in Computer Security follows the requirements of the B.S. in Computer Science (p. 172) except as noted below.

Computer Science Requirements		67.0
The following courses must be taken as the 6 CS track courses and the CS electives:		
CS 303	Algorithmic Number Theory and Cryptography	
CS 361	Concurrent Programming	
CS 370	Operating Systems	
CS 377	Software Security	
CS 467	Security and Human Behavior	
CS 472	Computer Networks: Theory, Applications and Programming	
CS 475	Computer and Network Security	
INFO 310	Human-Centered Design Process & Methods	
Computing & Informatics Requirements		15.0
Mathematics Requirements		27.0
Science Requirements		19.0
Arts & Humanities Requirements		36.0
The following course must be taken as the Social Studies elective:		
PSY 101	General Psychology I	
The following course must be taken as the Business elective:		
ECON 201	Principles of Microeconomics	
University Requirements		3.0
Free Electives		19.5
Total Credits		186.5

Computer Security Concentration Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
CI 101	Computing and Informatics Design I	2.0
CS 164	Introduction to Computer Science	3.0
MATH 121	Calculus I	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
UNIV 101	The Drexel Experience	1.0
Science lab		4.5
	Term Credits	17.5
Term 2		
CI 102	Computing and Informatics Design II	2.0
CS 171 or 175	Computer Programming I Advanced Computer Programming I	3.0
MATH 122	Calculus II	4.0

ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
Science lab		4.5
	Term Credits	17.5
Term 3		
CI 103	Computing and Informatics Design III	2.0
CS 172 or 176	Computer Programming II Advanced Computer Programming II	3.0
MATH 123	Calculus III	4.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
UNIV 101	The Drexel Experience	1.0
Science lab		4.5
	Term Credits	17.5
Term 4		
CS 265	Advanced Programming Tools and Techniques	3.0
CS 270	Mathematical Foundations of Computer Science	3.0
PSY 101	General Psychology I	3.0
MATH 200	Multivariate Calculus	4.0
SE 181	Introduction to Software Engineering and Development	3.0
	Term Credits	16.0
Term 5		
CS 260	Data Structures	3.0
MATH 221	Discrete Mathematics	3.0
ECON 201	Principles of Microeconomics	4.0
Free elective		6.0
	Term Credits	16.0
Term 6		
COM 230	Techniques of Speaking	3.0
CS 277	Algorithms and Analysis	3.0
CS 281	Systems Architecture	4.0
MATH 201	Linear Algebra	4.0
SE 310	Software Architecture I	3.0
	Term Credits	17.0
Term 7		
CS 283	Systems Programming	3.0
CS 360	Programming Language Concepts	3.0
Free Elective		6.0
Science elective		4.0
	Term Credits	16.0
Term 8		
CS 303	Algorithmic Number Theory and Cryptography	3.0
CS 361	Concurrent Programming	3.0
INFO 310	Human-Centered Design Process & Methods	3.0
MATH 311	Probability and Statistics I	4.0
PHIL 311	Ethics and Information Technology	3.0
	Term Credits	16.0
Term 9		
CS 370	Operating Systems	3.0
Arts & Humanities elective		3.0
Writing & Communications Elective		3.0
Free Elective		4.0
	Term Credits	13.0
Term 10		
CI 491 [WI]	Senior Project I	3.0
CS 467	Security and Human Behavior	3.0
CS 472	Computer Networks: Theory, Applications and Programming	3.0
Writing & Communications elective		3.0

Arts & Humanities elective		3.0
	Term Credits	15.0
Term 11		
CI 492 [WI]	Senior Project II	3.0
CS 475	Computer and Network Security	3.0
Arts & Humanities elective		3.0
Free Elective		4.0
	Term Credits	13.0
Term 12		
CI 493 [WI]	Senior Project III	3.0
CS 377	Software Security	3.0
Science Elective		3.0
Arts & Humanities Elective		3.0
	Term Credits	12.0

Total Credit: 186.5

Computer Science

Game Programming and Development Concentration

The concentration in game programming and development provides conceptual understanding of game design and practical experience in the design and the development of games. The courses in this concentration include fundamentals of game design and development, large-scale game development, and special topics in educational and experimental game design.

Additional Information

For more information about this concentration, visit the College of Computing & Informatics (https://drexel.edu/cci/academics/undergraduate-programs/bsba-computer-science/)' web site.

Degree Requirements

Students in the Game Programming and Development Concentration should follow the below concentration requirements in addition to the core degree requirements for the B.S. in Computer Science (p. 172).

The Game Programming and Development concentration follows the requirements of the B.S. in Computer Science (p. 172) except as noted below. For any questions regarding your plan of study, please contact your Undergraduate Advisor (https://drexel.edu/cci/current-students/undergraduate/advising/).

Computer Science Requirements		**64.0**
Select three of the following courses to fulfill the Game Development and Design track:		
CS 341	Serious Game Development	
or CS 342	Experimental Game Development	
CS 345	Computer Game Design and Development	
CS 387	Game AI Development	
CS 445	Topics in Computer Gaming	
Computing & Informatics Requirements		**15.0**
Mathematics Requirements		**27.0**
Science Requirements		**19.0**
The sequence below must be taken as the lab science sequence:		
PHYS 101	Fundamentals of Physics I	
& PHYS 102	and Fundamentals of Physics II	
& PHYS 201	and Fundamentals of Physics III	
Arts & Humanities Requirements		**36.0**
The following course must be taken as the Social Studies elective:		

PSY 101	General Psychology I	
The following courses must be taken as Arts & Humanities electives:		
ANIM 140	Computer Graphics Imagery I	
ANIM 211	Animation I	
GMAP 260	Overview of Computer Gaming	
VSST 110	Introductory Drawing	
University Requirements		**3.0**
Free Electives		**22.5**
The following courses must be taken as a free elective:		
GMAP 377	Game Development: Workshop I	
GMAP 378	Game Development: Workshop II	
Total Credits		186.5

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study (BS) - Game Programming and Development Concentration

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

5 YR 5 YR UG Co-op Concentration /Game Programming & Development

Term 1		Credits
CI 101	Computing and Informatics Design I	2.0
CS 164	Introduction to Computer Science	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121	Calculus I	4.0
PHYS 101	Fundamentals of Physics I	4.0
UNIV CI101	The Drexel Experience	1.0
	Term Credits	17.0
Term 2		
CI 102	Computing and Informatics Design II	2.0
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
CS 171	Computer Programming I	3.0

ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122	Calculus II	4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	17.0
Term 3		
CI 103	Computing and Informatics Design III	2.0
CS 172	Computer Programming II	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 123	Calculus III	4.0
PHYS 201	Fundamentals of Physics III	4.0
UNIV CI101	The Drexel Experience	1.0
	Term Credits	17.0
Term 4		
CS 265	Advanced Programming Tools and Techniques	3.0
CS 270	Mathematical Foundations of Computer Science	3.0
GMAP 260	Overview of Computer Gaming	3.0
MATH 201	Linear Algebra	4.0
SE 181	Introduction to Software Engineering and Development	3.0
	Term Credits	16.0
Term 5		
ANIM 140	Computer Graphics Imagery I	3.0
CS 260	Data Structures	3.0
PSY 101	General Psychology I	3.0
Free elective		6.0
	Term Credits	15.0
Term 6		
CS 277	Algorithms and Analysis	3.0
CS 281	Systems Architecture	4.0
SE 310	Software Architecture I	3.0
VSST 110	Introductory Drawing	3.0
GMPD Concentration Course		3.0
	Term Credits	16.0
Term 7		
COM 230	Techniques of Speaking	3.0
CS 283	Systems Programming	3.0
CS 360	Programming Language Concepts	3.0
Writing and Communications elective		3.0
Arts & Humanities elective		3.0
	Term Credits	15.0
Term 8		
ANIM 211	Animation I	3.0
GMAP 377	Game Development: Workshop I	3.0
MATH 200	Multivariate Calculus	4.0
MATH 221	Discrete Mathematics	3.0
PHIL 311	Ethics and Information Technology	3.0
	Term Credits	16.0
Term 9		
GMAP 378	Game Development: Workshop II	3.0
MATH 311	Probability and Statistics I	4.0
Business elective		4.0
Free elective		3.0
	Term Credits	14.0
Term 10		
CI 491 [WI]	Senior Project I	3.0
GMPD Concentration Course		3.0
Computer Science elective		6.0
Science elective		3.0
	Term Credits	15.0
Term 11		

CI 492 [WI]	Senior Project II	3.0
GMPD Concentration Course		3.0
Computer Science elective		6.0
Science elective		4.0
	Term Credits	16.0
Term 12		
CI 493 [WI]	Senior Project III	3.0
Computer Science elective		3.0
Writing & Communications elective		3.0
Free elective		3.5
	Term Credits	12.5

Total Credit: 186.5

Computing and Security Technology

Major: Computing and Security Technology
Degree Awarded: Bachelor of Science in Computing & Security Technology (BSCST)
Calendar Type: Quarter
Total Credit Hours: 188.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years)
Classification of Instructional Programs (CIP) Code: 11.1003
Standard Occupational Classification (SOC) Code: 15-1122

Note: The on-campus CST major (Full Time only) admits new and transfer students Fall Quarter. The online CST major (Part Time only) admits transfer students Fall and Spring Quarters.

About the Program

The College of Computing & Informatics' Bachelor of Science in Computing & Security Technology (BSCST) prepares students for work related to the management and administration of large-scale computing infrastructure. Students gain experience with core information technology (IT) areas including servers, databases, networks, the Web, and information security and cybersecurity. The program emphasizes practical education and fundamental concepts that are supplemented by laboratory experience.

Core courses provide students with practical knowledge and skills related to proprietary and open source servers, network administration, software development, database administration, and IT security. Students take advanced electives and a concentration in either Computing Technology or Computing Security. The advanced courses include topics such as mobile applications, IT risk assessment, intrusion detection, security audits, and computer forensics.

The degrees in Computing & Security Technology, Data Science (p. 192), and Information Systems (p. 197) share a common first year. This allows students to easily switch among the degrees early in their studies. In addition, some of the electives in each degree are accessible to students in the other two majors; this provides a deeper and broader set of advanced topics for students in all three majors.

The BS in Computing & Security Technology is offered as a full-time, on-campus bachelor's degree program or as an online, part-time degree completion program for students who have completed approximately two years of college work.

For more information about this program, please visit the BS in Computing & Security Technology web page (https://drexel.edu/cci/academics/

undergraduate-programs/bs-computing-security/) on the College of Computing & Informatics' website.

Degree Requirements

Students completing this major must select either a concentration in computing technology or a concentration in computing security.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Computing & Security Technology Core Requirements

CT 140	Network Administration I	3.0
CT 200	Server I	3.0
CT 201	Information Technology Security I	3.0
CT 210	Open Server I	3.0
CT 301	Information Technology Security II	3.0
CT 310	Open Server II	3.0
CT 320	Server II	3.0
CT 330	Network Administration II	3.0
Students completing this major must select either a concentration in Computing Technology or a concentration in Computing Security. see below		21.0

Information Science Requirements

INFO 101	Introduction to Computing and Security Technology	3.0
INFO 102	Introduction to Information Systems	3.0
INFO 103	Introduction to Data Science	3.0
INFO 200	Systems Analysis I	3.0
INFO 210	Database Management Systems	3.0
INFO 215	Social Aspects of Information Systems	3.0
INFO 310	Human-Centered Design Process & Methods	3.0
INFO 324 [WI]	Team Process and Product	3.0
INFO 355	Systems Analysis II	3.0
INFO 365	Database Administration I	3.0
INFO 420	Software Project Management	3.0

Programming Requirements **9.0**

Choose one of the following sequences		
INFO 151 & CS 171 & CS 172	Web Systems and Services I and Computer Programming I and Computer Programming II	
INFO 151 & INFO 152 & INFO 153	Web Systems and Services I and Web Systems and Services II and Applied Data Management	

Computing & Informatics Requirements

CI 101	Computing and Informatics Design I	2.0
CI 102	Computing and Informatics Design II	2.0
CI 103	Computing and Informatics Design III	2.0
CT 491 [WI]	Senior Project I	3.0
CT 496 [WI]	Senior Project II	3.0
CCI elective *		6.0

Mathematics Requirements

Choose Mathematics Sequence		8.0
If a Math seqence of less than 8 credits is taken, additional 2 credits added to free electives		
MATH 171 & MATH 172	Introduction to Analysis A and Introduction to Analysis B	
MATH 101 & MATH 102	Introduction to Analysis I and Introduction to Analysis II	
MATH 121 & MATH 122	Calculus I and Calculus II	
MATH 180	Discrete Computational Structures	4.0
STAT 201	Introduction to Business Statistics	4.0

Natural Science Requirements ** **8.0**

Liberal Studies Requirements

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
COM 230	Techniques of Speaking	3.0
Liberal Studies Electives ***		12.0

University Requirements

UNIV CI101	The Drexel Experience	2.0
or CI 120	CCI Transfer Student Seminar	
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
Free Electives		**32.0**
Total Credits		188.0

*   One course must be a CCI 300 level or higher course.

**   Students select any non-required courses from the following: ANAT, BIO, CHEM, ENVS, FDSC, NFS, PHEV, PHYS, HSCI, GEO, ENSS.

*** Students select any non-required courses from the following: ANTH, COM, ENGL, HIST, PHIL, PSCI, PSY, SOC, WRIT, ECON, ENTP, ARTH, FMST, MUSC, TVST, VSST

Please note: **If a Computing & Security Technology student pursues a Business Administration Minor, MIS classes do not count towards the Business Administration Minor for Computing & Security Technology students. Students must choose another option to fulfill the Business Administration Minor requirements.**

Concentration in Computing Technology

Computing Technology Concentration Requirements

CT 335	Mobile Applications	3.0
CT 353	Virtual Environments and Cloud Security	3.0
CT 355	Wireless Network Security Technology	3.0
CT 415	Disaster Recovery and Continuity Planning	3.0
INFO 366	Database Administration II	3.0

Computing Technology Electives

Select two of the following:		6.0
CT 362	Network Auditing Tools	
CT 393	Information Technology Security Risk Assessment	
CT 412	Information Technology Security Policies	
INFO 215	Social Aspects of Information Systems	
Total Credits		21.0

Concentration in Computing Security

Computing Security Concentration Requirements

CT 212	Computer Forensics I: Fundamentals	3.0
CT 312	Access Control and Intrusion Detection Technology	3.0
CT 400	Network Security	3.0
CT 412	Information Technology Security Policies	3.0
CT 432	Information Technology Security Systems Audits	3.0

Computing Security Electives

Select two of the following:		6.0
CT 250	IT Security Awareness	
CT 382	Applied Cryptography	
CT 393	Information Technology Security Risk Assessment	

CT 414	Ethical Hacking and Penetration Testing	
CT 415	Disaster Recovery and Continuity Planning	
Total Credits		21.0

Concentrations: Sample Plans of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Computing Technology Concentration

		Credits
Term 1		
CI 101	Computing and Informatics Design I	2.0
INFO 101	Introduction to Computing and Security Technology	3.0
INFO 151	Web Systems and Services I	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
UNIV CI101	The Drexel Experience	1.0
MATH 171	Introduction to Analysis A	3.0
	Term Credits	15.0
Term 2		
CI 102	Computing and Informatics Design II	2.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
INFO 102	Introduction to Information Systems	3.0
INFO 152 or CS 171	Web Systems and Services II / Computer Programming I	3.0
MATH 172	Introduction to Analysis B	3.0
COOP 101	Career Management and Professional Development	0.0
	Term Credits	15.0
Term 3		
CI 103	Computing and Informatics Design III	2.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
INFO 103	Introduction to Data Science	3.0
INFO 153 or CS 172	Applied Data Management / Computer Programming II	3.0
MATH 180	Discrete Computational Structures	4.0
UNIV CI101	The Drexel Experience	1.0
	Term Credits	16.0
Term 4		
CT 140	Network Administration I	3.0
CT 210	Open Server I	3.0
INFO 200	Systems Analysis I	3.0
INFO 215	Social Aspects of Information Systems	3.0
Free Electives		3.0
	Term Credits	15.0
Term 5		
CT 310	Open Server II	3.0
CT 330	Network Administration II	3.0
INFO 210	Database Management Systems	3.0
STAT 201	Introduction to Business Statistics	4.0
Free Electives		4.0
	Term Credits	17.0
Term 6		
CT 200	Server I	3.0
CT 201	Information Technology Security I	3.0
CT 212	Computer Forensics I: Fundamentals	3.0
Liberal Studies Elective		3.0
Science Elective I		4.0
	Term Credits	16.0
Term 7		
CT 301	Information Technology Security II	3.0
CT 320	Server II	3.0
INFO 355	Systems Analysis II	3.0
Free Elective		3.0
Science Elective II		4.0
	Term Credits	16.0
Term 8		
CT 312	Access Control and Intrusion Detection Technology	3.0
INFO 310	Human-Centered Design Process & Methods	3.0
INFO 365	Database Administration I	3.0
COM 230	Techniques of Speaking	3.0
Liberal Studies Elective		3.0
Free Elective		3.0
	Term Credits	18.0
Term 9		
CT 412	Information Technology Security Policies	3.0
INFO 324 [WI]	Team Process and Product	3.0
INFO 420	Software Project Management	3.0
Computing Security Elective		3.0
Free Elective		3.0
	Term Credits	15.0
Term 10		
CT 400	Network Security	3.0
CCI Elective		3.0
Computing Security Elective		3.0
Liberal Studies Elective		3.0
Free Elective		3.0
	Term Credits	15.0
Term 11		
CT 432	Information Technology Security Systems Audits	3.0
CT 491 [WI]	Senior Project I	3.0
Free Electives		9.0
	Term Credits	15.0
Term 12		
CT 496 [WI]	Senior Project II	3.0
CCI Elective		3.0
Free Electives		6.0
Liberal Studies Elective		3.0
	Term Credits	15.0

Total Credit: 188.0

Computing Security Concentration

		Credits
Term 1		
CI 101	Computing and Informatics Design I	2.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
INFO 101	Introduction to Computing and Security Technology	3.0
INFO 151	Web Systems and Services I	3.0
MATH 171	Introduction to Analysis A	3.0
UNIV CI101	The Drexel Experience	1.0
	Term Credits	15.0
Term 2		
CI 102	Computing and Informatics Design II	2.0
CIVC 101	Introduction to Civic Engagement	1.0
CS 171	Computer Programming I	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0

INFO 102	Introduction to Information Systems	3.0
MATH 172	Introduction to Analysis B	3.0
COOP 101	Career Management and Professional Development	0.0
	Term Credits	15.0
Term 3		
CI 103	Computing and Informatics Design III	2.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
INFO 103	Introduction to Data Science	3.0
INFO 153 or CS 172	Applied Data Management Computer Programming II	3.0
MATH 180	Discrete Computational Structures	4.0
UNIV CI101	The Drexel Experience	1.0
	Term Credits	16.0
Term 4		
CT 140	Network Administration I	3.0
CT 201	Information Technology Security I	3.0
INFO 200	Systems Analysis I	3.0
INFO 215	Social Aspects of Information Systems	3.0
Free Elective		3.0
	Term Credits	15.0
Term 5		
CT 301	Information Technology Security II	3.0
CT 330	Network Administration II	3.0
INFO 210	Database Management Systems	3.0
STAT 201	Introduction to Business Statistics	4.0
Free Electives		4.0
	Term Credits	17.0
Term 6		
CT 200	Server I	3.0
CT 210	Open Server I	3.0
CT 335	Mobile Applications	3.0
Liberal Studies Elective		3.0
Science Elective I		4.0
	Term Credits	16.0
Term 7		
CT 310	Open Server II	3.0
CT 320	Server II	3.0
INFO 355	Systems Analysis II	3.0
Free Elective		3.0
Science Elective II		4.0
	Term Credits	16.0
Term 8		
COM 230	Techniques of Speaking	3.0
INFO 310	Human-Centered Design Process & Methods	3.0
INFO 365	Database Administration I	3.0
Computing Technology Elective		3.0
Liberal Studies Elective		3.0
Free Elective		3.0
	Term Credits	18.0
Term 9		
INFO 324 [WI]	Team Process and Product	3.0
INFO 366	Database Administration II	3.0
INFO 420	Software Project Management	3.0
Free Electives		6.0
	Term Credits	15.0
Term 10		
CT 355	Wireless Network Security Technology	3.0
CCI Elective		6.0
Liberal Studies Elective		3.0
Free Elective		3.0
	Term Credits	15.0

Term 11		
CT 362	Network Auditing Tools	3.0
Computing Technology Elective		3.0
CT 491 [WI]	Senior Project I	3.0
Free Electives		6.0
	Term Credits	15.0
Term 12		
CT 415	Disaster Recovery and Continuity Planning	3.0
CT 496 [WI]	Senior Project II	3.0
Free Elective		6.0
Liberal Studies Elective		3.0
	Term Credits	15.0

Total Credit: 188.0

Accelerated Degrees

The College of Computing & Informatics offers several Accelerated Degree programs designed to allow students to complete both a bachelor's and a graduate degree along with cooperative educational experience in fewer years than would be typical if pursuing the degrees separately. Students accepted in this program can combine any of the College bachelor's and master's degree programs as well as other options:

- Any CCI BS/any CCI MS Accelerated Degree (BS & MS in five years, including 2 Co-ops)
- Any CCI BS/MBA Accelerated Degree (BS/MBA)
- Any CCI BS/JD Accelerated Degree (BS/JD)

For more information on the criteria for entering this program visit the BS/MS Accelerated Degree (http://drexel.edu/undergrad/academics/accelerated-degrees/) page on Drexel's website.

For more information on how to apply for the BS/MS Accelerated Degree program, please visit the College of Computing & Informatics' website (https://drexel.edu/cci/admissions/undergraduate/admissions-requirements/cci-bsms-degree-admissions/).

Co-Op/Career Opportunities
Co-Op Options

Three co-op options are available for this program:

- 5-year/3 co-op
- 4-year/1 co-op
- Accelerated Degree: 5-year/2 co-op

Co-op is not available for online students.

Career Opportunities

Graduates of the Computing and Security Technology program who complete a concentration in Computing Technology can pursue careers as information technologists and advanced technicians in a wide range of industries. Information technologists are capable of performing multiple IT tasks and accessing various information resources. The program gives students a unique set of applied skills that allow them to fill a number of roles as part of the information systems team. Graduates with a concentration in Computing Security pursue careers as advanced technicians who operate and administer the security tools, technologists who create and install security solutions, and leaders who define the security policies.

Job titles of recent computing and security technology graduates include:

- Security Administrator
- Chief Information Security Officer
- IT Audit Manager
- Project Manager
- Lead Systems Engineer
- Network Engineer
- Server Engineer

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more information on career opportunities.

Facilities

3675 Market Street

In March 2019, the College of Computing & Informatics relocated to 3675 Market (https://drexel.edu/cci/about/our-facilities/). For the first time in the College's history, all CCI faculty, students and professional staff are housed under one roof. Occupying two floors in the brand new uCity Square building, CCI's new home offers state-of-the-art technology in our classrooms, labs, meeting areas and collaboration spaces. 3675 Market offers Class A laboratory, office, coworking, and convening spaces. In fall 2019, the College will open a third floor which will include additional offices, classrooms, a research lab, a maker space, and a ground-breaking DXC Technology Innovation Lab. Located at the intersection of Market Street and 37th Street, 3675 Market will act as a physical nexus, bridging academic campuses and medical centers to the east and south, the commercial corridors along Market Street and Chestnut Street, and the residential communities to the north and west.

The uCity Square building offers:

- Speculative lab/office space
- World-class facilities operated by CIC (https://cic.us/philadelphia/)
- Café/restaurant on-site
- Quorum, a two-story, 15K SF convening space and conference center
- Adjacent to future public square
- Access to Science Center's nationally renowned business acceleration and technology commercialization programs

Drexel University Libraries

Drexel University Libraries (http://www.library.drexel.edu/) is a learning enterprise, advancing the University's academic mission through serving as educators, supporting education and research, collaborating with researchers, and fostering intentional learning outside of the classroom. Drexel University Libraries engages with Drexel communities through three physical locations, including W. W. Hagerty Library, Queen Lane Library, and the Library Learning Terrace, as well as a vibrant online presence which sees, on average, over 8,000 visits per day. In the W.W. Hagerty Library location, College of Computing & Informatics students have access to private study rooms and nearly half a million books, periodicals, DVDs, videos and University Archives. All fields of inquiry are covered, including: library and information science, computer science, software engineering, health informatics, information systems, and computing technology. Resources are available online at library.drexel.edu (http://www.library.drexel.edu/) or in-person at W. W. Hagerty Library (http://www.library.drexel.edu/locations/).

The Libraries also make available laptop and desktop PC and Mac computers, printers and scanners, spaces for quiet work or group projects and designated 24/7 spaces. Librarians and library staff—including a liaison librarian for computing and informatics—are available for individual research consultations and to answer questions about materials or services.

CCI Commons

Located on the 10th floor of 3675 Market Street, the CCI Commons is an open lab and collaborative work environment for students. It features desktop computers, a wireless/laptop area, free black and white printing, and more collaborative space for its students. Students have access to 3675 Market's fully equipped conference room with 42" displays and videoconferencing capabilities. The CCI Commons provides technical support to students, faculty, and professional staff. In addition, the staff provides audio-visual support for all presentation classrooms within 3675 Market. Use of the CCI Commons is reserved for all students taking CCI courses.

The computers for general use are Microsoft Windows and Macintosh OSX machines with appropriate applications which include the Microsoft Office suite, various database management systems, modeling tools, and statistical analysis software. Library related resources may be accessed at the CCI Commons and through the W.W. Hagerty Library. The College is a member of the Rational SEED Program which provides cutting-edge software development and project management software for usage in the CCI Commons and CCI classrooms. The College is also a member of the Microsoft Academic Alliance known also as "DreamSpark" that allows students free access to a wide array of Microsoft software titles and operating systems.

The CCI Commons, student labs, and classrooms have access to networked databases, print and file resources within the College, and the Internet via the University's network. Email accounts, Internet and BannerWeb access are available through the Office of Information Resources and Technology.

CCI Learning Center

The CCI Learning Center (CCILC), located in 3675 Market Street's CCI Commons student computer lab, provides consulting and other learning resources for students taking computer science classes. The CCILC is staffed by graduate and undergraduate computer science students from the College of Computing & Informatics.

The CCILC and CCI Commons serve as a central hub for small group work, student meetings, and TA assistance.

Research Laboratories

The College houses multiple research labs, led by CCI faculty, in 3675 Market Street including: the Drexel Health and Risk Communication Lab, Interactive Systems for Healthcare, Socio-Technical Studies Group, Intelligent Information & Knowledge Computing Research Lab, Evidence-based Decision Making Lab, Applied Symbolic Computation Laboratory (ASYM), High Performance Computing Laboratory (SPIRAL), Drexel Research on Play (RePlay) Laboratory, Software Engineering Research Group (SERG), Social Computing Research Group, Vision and Cognition Laboratory (VisCog) and the Vision and Graphics Laboratory. For more information on these laboratories, please visit the College's research web page (http://cci.drexel.edu/research.aspx).

Evaluations

The College of Computing & Informatics works continually to improve its degree programs. As part of this effort, the Computing & Security Technology degree is evaluated relative to the following Objectives and Outcomes.

BS Computing & Security Technology Program Educational Objectives

Within three to five years of graduating, alumni of the program are expected to achieve one or more of the
following milestones:

- Be valued contributors to private or public organizations as demonstrated by promotions, increased responsibility, or other professional recognition
- Contribute to professional knowledge as demonstrated by published papers, technical reports, patents, or conference presentations
- Succeed in continuing professional development as demonstrated by completion of graduate studies or professional certifications
- Display commitment and leadership within the profession and community as demonstrated by contributions towards society's greater good and prosperity

BS Computing & Security Technology Program Student Outcomes

The program enables students to attain, by the time of graduation:

- An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline
- An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
- An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
- An ability to function effectively on teams to accomplish a common goal
- An understanding of professional, ethical, legal, security and social issues and responsibilities
- An ability to communicate effectively with a range of audiences
- An ability to analyze the local and global impact of computing on individuals, organizations, and society
- Recognition of the need for and an ability to engage in continuing professional development
- An ability to use current techniques, skills, and tools necessary for computing practice

Computing & Informatics Faculty

Denise E. Agosto, PhD *(Rutgers, The State University of New Jersey)*. Professor. Youth information behaviors, public libraries, multicultural issues in youth library services, and qualitative research methods.

Yuan An, PhD *(University of Toronto, Canada) Director of International Programs*. Associate Professor. Conceptual modeling, schema and ontology mapping, information integration, knowledge representation, requirements engineering, healthcare information systems, semantic web.

David Augenblick, MS *(University of Pennsylvania)*. Associate Teaching Professor. Introductory and object-oriented programming, data structures and database systems, computer application project management,

application of computer programming principles and solutions to engineering problems.

Marcello Balduccini, PhD *(Texas Tech University) Senior Research Scientist, Applied Informatics Group*. Associate Research Professor. Logic programming, declarative programming, answer set programming, knowledge representation, various types of reasoning

Ellen Bass, PhD *(Georgia Institute of Technology) Joint Appointment with the College of Nursing and Health Professions*. Professor. Characterizing human judgement and decision making, modeling human judgement when supported by information automation, computational models of human-human and human-automation coordination.

Mark Boady, PhD *(Drexel University)*. Assistant Teaching Professor. Computer Algebra, complex symbolic calculations, automation of computation problems

David E. Breen, PhD *(Rensselaer Polytechnic Institute)*. Associate Professor. Self-organization, biomedical image/video analysis, biological simulation, geometric modeling and visualization

Matthew Burlick, PhD *(Stevens Institute of Technology)*. Assistant Teaching Professor. Image processing, machine learning, real-time video tracking, object detection and classification, statistics/probability, and acoustics

Yuanfang Cai, PhD *(University of Virginia)*. Associate Professor. Formal software design modeling and analysis, software economics, software evolution and modularity.

Christopher Carroll, MS *(Drexel University) BSCST Program Director*. Associate Teaching Professor. Information technology within healthcare companies, computer networking and design, IT infrastructure, server technology, information security, virtualization and cloud computing.

Bruce W. Char, PhD *(University of California-Berkeley)*. Professor. Symbolic mathematical computation, algorithms and systems for computer algebra, problem-solving environments parallel and distributed computation.

Chaomei Chen, PhD *(University of Liverpool)*. Professor. Information visualization, visual analytics, knowledge domain visualization, network analysis and modeling, scientific discovery, science mapping, scientometrics, citation analysis, human-computer interaction.

Catherine D. Collins, MLIS *(Indiana University)*. Associate Teaching Professor. Knowledge management, collection development, management of information organizations, information sources and services, international development.

M. Carl Drott, PhD *(University of Michigan)*. Associate Professor. Systems analysis techniques, web usage, competitive intelligence.

Andrea Forte, PhD *(Georgia Institute of Technology) PhD Program Director, and MS in Information Program Director*. Associate Professor. Social computing, human-computer interaction, computer-supported cooperative work, computer-supported collaborative learning, information literacy.

Susan Gasson, PhD *(University of Warwick)*. Associate Professor. The co-design of business and IT-systems, distributed cognition & knowledge management in boundary-spanning groups, human-centered design, social informatics, online learning communities, grounded theory.

Christopher Geib, PhD *(University of Edinburgh)*. Associate Professor. Decision making and reasoning under conditions of uncertainty, planning, scheduling, constraint, based reasoning, human computer and robot interaction, probabilistic reasoning, computer network security, large scale process control, user interfaces.

Colin Gordon, PhD *(University of Washington)*. Assistant Professor. Software reliability, program behavior, concurrent and systems-level code, formal assurance, programming models, distributed computing, even testing

Jane Greenberg, PhD *(University of Pittsburgh) Alice B. Kroeger Professor*. Metadata, ontological engineering, data science, knowledge organization, information retrieval

Peter Grillo, PhD *(Temple University) Associate Department Head for Undergraduate Affairs, Information Science*. Teaching Professor. Strategic applications of technology within organizations.

Jeremy R. Johnson, PhD *(Ohio State University)*. Professor. Computer algebra; parallel computations; algebraic algorithms; scientific computing.

Xia Lin, PhD *(University of Maryland) Department Head, Information Science*. Professor. Digital libraries, information visualization, visual interface design, knowledge mapping, human-computer interaction, object-oriented programming, information retrieval, information architecture, information-seeking behaviors in digital environments.

Geoffrey Mainland, PhD *(Harvard University)*. Assistant Professor. High-level programming languages and runtime support for non-general purpose computation.

Spiros Mancoridis, PhD *(University of Toronto) The Auerbach Berger Chair in Cybersecurity Distinguished Professor of Computer Science*. Professor. Software engineering; software security; code analysis; evolutionary computation.

Gabriela Marcu, PhD *(Carnegie Mellon University)*. Assistant Teaching Professor. Human-computer interaction, health informatics, action research, ethnography, user experience design, designing for social change, organizational information systems, ubiquitous computing, knowledge management.

Adelaida Alban Medlock, MS *(Drexel University)*. Associate Teaching Professor. Introductory programming; computer science education.

William Mongan, MS *(Drexel University) Associate Department Head for Undergraduate Affairs, Computer Science*. Associate Teaching Professor. Service-oriented architectures, program comprehension, reverse engineering, software engineering, computer architecture, computer science education, engineering education outreach

Ko Nishino, PhD *(University of Tokyo) Associate Department Head for Graduate Affairs, Computer Science*. Professor. Computer vision, computer graphics, analysis and synthesis of visual appearance.

Danuta A. Nitecki, PhD *(University of Maryland at College Park) Dean of Libraries.* Professor. Library metrics and use in management, library as place, and academic library service models.

Krzysztof Nowak, PhD *(Washington University)*. Associate Teaching Professor. Fourier analysis, partial differential equations, image processing, wavelets, asymptotic distribution of eigenvalues, numerical methods and algorithms, computer science education.

Santiago Ontañón, PhD *(University of Barcelona)*. Assistant Professor. Game AI, computer games, artificial intelligence, machine learning, case-based reasoning

Jung-ran Park, PhD *(University of Hawaii at Manoa)*. Associate Professor. Knowledge organization and representation, metadata, computer-mediated communication, cross-cultural communication, multilingual information access.

Alex Poole, PhD *(University of North Carolina)*. Assistant Professor. Digital curation, archives and records management, digital humanities, and diversity, inclusivity, and equity.

Jeffrey L. Popyack, PhD *(University of Virginia)*. Professor. Operations research, stochastic optimization, computational methods of Markov decision processes; artificial intelligence, computer science education.

Lori Richards, PhD *(University of North Carolina)*. Assistant Professor. Archives, digital curation, electronic records management, information technology and digital collections, cloud computing and record keeping, management of information organizations.

Michelle L. Rogers, PhD *(University of Wisconsin-Madison)*. Associate Professor. Human-computer interaction, healthcare informatics, human factors engineering, socio-technical systems, health services research, patient safety.

Jeffrey Salvage, MS *(Drexel University)*. Teaching Professor. Object-oriented programming, multi-agent systems, software engineering, database theory, introductory programming, data structures.

Dario Salvucci, PhD *(Carnegie Mellon University) Department Head, Computer Science*. Professor. Human computer interaction, cognitive science, machine learning, applications for driving.

Kurt Schmidt, MS *(Drexel University)*. Associate Teaching Professor. Data structures, math foundations for computer science, programming tools, programming languages.

Ali Shokoufandeh, PhD *(Rutgers University) Senior Associate Dean of Research*. Professor. Theory of algorithms, graph theory, combinational optimization, computer vision.

Erin Solovey, PhD *(Tufts University)*. Assistant Professor. Human-computer interaction, brain-computer interfaces, tangible interaction, machine learning, human interaction with complex and autonomous systems.

Il-Yeol Song, PhD *(Louisiana State University)*. Professor. Conceptual modeling, ontology and patterns, data warehouse and OLAP, object-oriented analysis and design with UML, medical and bioinformatics data modeling & integration,.

Julia Stoyanovich, PhD *(Columbia University)*. Assistant Professor. Data and knowledge management, big data, biological data management, search and ranking.

Brian Stuart, PhD *(Purdue University)*. Associate Teaching Professor. Machine learning, networking, robotics, image processing, simulation, interpreters, data storage, operating systems, computer science, data communications, distributed/operating systems, accelerated computer programming, computer graphics.

Filippos Vokolos, PhD *(Polytechnic University)*. Assistant Teaching Professor. System architecture, principles of software design and construction, verification and validation methods for the development of

large software systems, foundations of software engineering, software verification & validation, software design, programming languages, dependable software systems.

Rosina Weber, PhD *(Federal University of Santa Catarina)*. Associate Professor. Case-based reasoning, explainable artificial intelligence, machine learning, textual analytics, natural language understanding, language models, recommender systems, technological aspects of knowledge management, project management, and requirements engineering.

Erija Yan, PhD *(Indiana University)*. Assistant Professor. Network Science, information analysis and retrieval, scholarly communication methods and applications.

Emeritus Faculty

Michael E. Atwood, PhD *(University of Colorado)*. Professor Emeritus. Human-computer interaction, computer-supported cooperative work, organizational memory.

Thomas A. Childers, PhD *(Rutgers University)*. Professor Emeritus. Measurement, evaluation, and planning of information and library services, the effectiveness of information organizations.

David E. Fenske, PhD *(University of Wisconsin-Madison)*. Dean Emeritus and Professor. Digital libraries, informatics, knowledge management and information technologies.

John B. Hall, PhD *(Florida State University)*. Professor Emeritus. Academic library service, library administration, organization of materials.

Katherine W. McCain, PhD *(Drexel University)*. Professor Emeritus. Scholarly communication, information production and use in the research process, development and structure of scientific specialties, diffusion of innovation, bibliometrics, evaluation of information retrieval systems.

Carol Hansen Montgomery, PhD *(Drexel University) Dean of Libraries Emeritus*. Research Professor. Selection and use of electronic collections, evaluation of library and information systems, digital libraries, economics of libraries and digital collections.

Delia Neuman, PhD *(The Ohio State University)*. Professor Emerita. Learning in information-rich environments, instructional systems design, the use of media for learning, and school library media.

Gerry Stahl, PhD *(University of Colorado)*. Professor Emeritus. Human-computer interaction, computer-supported cooperative work, computer-supported collaborative learning, theory of collaboration.

Howard D. White, PhD *(University of California at Berkeley)*. Professor Emeritus. Literature information systems, bibliometrics, research methods, collection development, online searching.

Susan Wiedenbeck, PhD *(University of Pittsburgh)*. Professor Emeritus. Human-computer interaction, end-user programming/end-user development, empirical studies of programmers, interface design and evaluation.

Data Science

Major: Data Science
Degree Awarded: Bachelor of Science in Data Science (BSDS)
Calendar Type: Quarter
Total Credit Hours: 187.0

Co-op Options: Three Co-op (Five years); One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 11.0401; 11.0501; 11.0802
Standard Occupational Classification (SOC) code: *15-1121; 15-1141*

About the Program

The Bachelor of Science in Data Science (BSDS) prepares students to meet the challenges presented by the explosive growth of very large scale and complex data sources. The availability of data from sources such as business activities, social media and scientific instruments constantly creates new problems requiring data-driven solutions and opportunities and problems for innovation. BS in Data Science students develop the knowledge and skill to address these opportunities for the benefit of individuals and organizations. Students in the degree complete a minor, typically in business or the sciences, to provide knowledge and skill in a specific subject area to which data science techniques can be applied.

Data Science students learn to:

- Define domain specific and context-relevant data analytics questions and hypotheses for individuals and organizations.
- Select relevant data sources and transform data suitable for solving data analytics problems.
- Identify appropriate techniques and tools for acquiring, retrieving, analyzing, and making use of the data.
- Apply data analytics techniques and skills to build analytical and predictive models for answering data science questions.
- Create visualizations and communicate data analytics results to stakeholders and decision makers.
- Assess the necessary skills arising from the interdisciplinary nature of data science as a combination of hacking skills, analytical techniques, and domain knowledge.

The degrees in Computing and Security Technology (p. 185), Data Science, and Information Systems (p. 197) share a common first year. This allows students to easily switch among the degrees early in their studies. In addition, some of the electives in each degree are accessible to students in the other two majors; this provides a deeper and broader set of advanced topics for students in all three majors.

Additional Information

For more information about this program, please visit the BS in Data Science web page (https://drexel.edu/cci/academics/undergraduate-programs/bs-datascience/) on the College of Computing & Informatics' website.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Data Science Requirements

INFO 101	Introduction to Computing and Security Technology	3.0
INFO 102	Introduction to Information Systems	3.0
INFO 103	Introduction to Data Science	3.0
INFO 200	Systems Analysis I	3.0
INFO 202	Data Curation	3.0
INFO 210	Database Management Systems	3.0
or CS 461	Database Systems	

INFO 212	Data Science Programming I	3.0
INFO 213	Data Science Programming II	3.0
INFO 215	Social Aspects of Information Systems	3.0
INFO 250	Information Visualization	3.0
INFO 300	Information Retrieval Systems	3.0
INFO 323	Cloud Computing and Big Data	3.0
INFO 332	Exploratory Data Analytics	3.0
INFO 371	Data Mining Applications	3.0
INFO 432	Advanced Data Analytics	3.0
INFO 440	Social Media Data Analysis	3.0
INFO 442	Data Science Projects	3.0
CCI Electives		**6.0**
Select 2 CCI courses that are at 200 or above level and not otherwise required		
Data Science Electives		**6.0**
Select 2 of the following courses:		
CS 375	Web and Mobile App Development	
CS 380	Artificial Intelligence	
CS 383	Machine Learning	
INFO 315	Advanced Database Management Systems	
INFO 350	Visual Analytics	
INFO 355	Systems Analysis II	
INFO 420	Software Project Management	
Computing and Informatics Requirements		
CI 101	Computing and Informatics Design I	2.0
CI 102	Computing and Informatics Design II	2.0
CI 103	Computing and Informatics Design III	2.0
CI 491 [WI]	Senior Project I	3.0
CI 492 [WI]	Senior Project II	3.0
CI 493 [WI]	Senior Project III	3.0
Introductory Programming		
INFO 151	Web Systems and Services I	3.0
CS 171	Computer Programming I	3.0
CS 172	Computer Programming II	3.0
Mathematics Requirements		
Select one of the following sequences:		12.0
MATH 101 & MATH 102 & MATH 180	Introduction to Analysis I and Introduction to Analysis II and Discrete Computational Structures	
MATH 121 & MATH 122 & MATH 180	Calculus I and Calculus II and Discrete Computational Structures	
Statistics Requirements		
STAT 201	Introduction to Business Statistics	4.0
STAT 202	Business Statistics II	4.0
Natural Science Requirements		
Science electives: Select from ANAT, BIO, CHEM, ENVS, FDSC, NFS, PHEV, PHYS. Courses from other departments may be considered with advisor approval.		8.0
Behavioral and Social Science Requirements		
PSY 101	General Psychology I	3.0
PSY 330	Cognitive Psychology	3.0
Arts and Humanities Requirements		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
COM 230	Techniques of Speaking	3.0
or COM 310	Technical Communication	
University and College Requirements		
UNIV CI101	The Drexel Experience	2.0
or CI 120	CCI Transfer Student Seminar	

CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
Minor Requirements [*]		**24.0**
Choose a minor in a data science application area including business and natural science		
Free Electives		**27.0**
Total Credits		187.0

[*] Students should consult their academic advisor regarding a minor that requires more than 24.0 credits. *Please note:* If a Business Administration Minor is selected, MIS classes do not count towards the Business Administration Minor for Data Science students. Students must choose another option to fulfill the Business Administration Minor requirements.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
CI 101	Computing and Informatics Design I	2.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
INFO 101	Introduction to Computing and Security Technology	3.0
INFO 151	Web Systems and Services I	3.0
MATH 101 or 121	Introduction to Analysis I Calculus I	4.0
UNIV CI101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
CI 102	Computing and Informatics Design II	2.0
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
CS 171	Computer Programming I	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0

INFO 102	Introduction to Information Systems	3.0
MATH 102 or 122	Introduction to Analysis II Calculus II	4.0
	Term Credits	16.0
Term 3		
CI 103	Computing and Informatics Design III	2.0
CS 172	Computer Programming II	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
INFO 103	Introduction to Data Science	3.0
MATH 180	Discrete Computational Structures	4.0
UNIV CI101	The Drexel Experience	1.0
	Term Credits	16.0
Term 4		
INFO 200	Systems Analysis I	3.0
INFO 202	Data Curation	3.0
INFO 210 or CS 461	Database Management Systems Database Systems	3.0
INFO 212	Data Science Programming I	3.0
STAT 201	Introduction to Business Statistics	4.0
	Term Credits	16.0
Term 5		
INFO 213	Data Science Programming II	3.0
INFO 215	Social Aspects of Information Systems	3.0
INFO 250	Information Visualization	3.0
PSY 101	General Psychology I	3.0
STAT 202	Business Statistics II	4.0
	Term Credits	16.0
Term 6		
COM 230 or 310 [WI]	Techniques of Speaking Technical Communication	3.0
INFO 300	Information Retrieval Systems	3.0
INFO 323	Cloud Computing and Big Data	3.0
INFO 371	Data Mining Applications	3.0
Science Elective		4.0
	Term Credits	16.0
Term 7		
INFO 332	Exploratory Data Analytics	3.0
PSY 330	Cognitive Psychology	3.0
Data Science Elective		3.0
Free Elective		3.0
Science Elective		4.0
	Term Credits	16.0
Term 8		
INFO 432	Advanced Data Analytics	3.0
INFO 440	Social Media Data Analysis	3.0
Data Science Elective		3.0
Minor Elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 9		
INFO 442	Data Science Projects	3.0
Free elective		3.0
Minor Electives		6.0
CCI Elective		3.0
	Term Credits	15.0
Term 10		
CI 491 [WI]	Senior Project I	3.0
Free electives		6.0
Minor Electives		6.0
	Term Credits	15.0
Term 11		

CI 492 [WI]	Senior Project II	3.0
CCI Elective		3.0
Free electives		6.0
Minor Elective		3.0
	Term Credits	15.0
Term 12		
CI 493 [WI]	Senior Project III	3.0
Free electives		6.0
Minor Electives		6.0
	Term Credits	15.0

Total Credit: 187.0

Accelerated Degrees

The College of Computing & Informatics offers several Accelerated Degree programs designed to allow students to complete both a bachelor's degree and a graduate degree along with cooperative educational experience in fewer years than would be typical if pursuing the degrees separately. Students accepted in this program can combine any of the College bachelor's and master's degree programs as well as other options.

- Any CCI BS/any CCI MS Accelerated Degree (BS & MS in five years, including 2 Co-ops)
- Any CCI BS/MBA Accelerated Degree (BS/MBA)
- Any CCI BS/JD Accelerated Degree (BS/JD)

For more information on the criteria for entering this program, visit the BS/MS Accelerated Degree (http://drexel.edu/undergrad/academics/accelerated-degrees/) page on Drexel's website.

For more information on how to apply for the BS/MS Accelerated Degree program, please visit the College of Computing & Informatics' website (https://drexel.edu/cci/admissions/undergraduate/admissions-requirements/cci-bsms-degree-admissions/).

Co-op/Career Opportunities

Co-Op Options

Three co-op options are available for this program:

- 5-year/3 co-op
- 4-year/1 co-op
- Accelerated Degree (BS & MS): 5-year/2 co-op

Career Opportunities

The new data science major provides valuable skills that can be transported to a number of job settings. The demand for graduates with data science knowledge is strong, and employers often want evidence of additional communication and problem-solving skills that can be applicable to specific disciplines. Data science program graduates could potentially serve as key members of organizational data science teams able to create novel information products, with an emphasis on solving problems that can only be addressed using large and disparate data sources. The program is also an excellent preparation for graduate study in data science.

Sample job titles for data science graduates include:

- Data Scientist
- Business Intelligence Officer

- Information Architect
- Usability Analyst

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

3675 Market Street

In March 2019, the College of Computing & Informatics relocated to 3675 Market (https://drexel.edu/cci/about/our-facilities/). For the first time in the College's history, all CCI faculty, students and professional staff are housed under one roof. Occupying two floors in the brand new uCity Square building, CCI's new home offers state-of-the-art technology in our classrooms, labs, meeting areas and collaboration spaces. 3675 Market offers Class A laboratory, office, coworking, and convening spaces. In fall 2019, the College will open a third floor which will include additional offices, classrooms, a research lab, a maker space, and a ground-breaking DXC Technology Innovation Lab. Located at the intersection of Market Street and 37th Street, 3675 Market will act as a physical nexus, bridging academic campuses and medical centers to the east and south, the commercial corridors along Market Street and Chestnut Street, and the residential communities to the north and west.

The uCity Square building offers:

- Speculative lab/office space
- World-class facilities operated by CIC (https://cic.us/philadelphia/)
- Café/restaurant on-site
- Quorum, a two-story, 15K SF convening space and conference center
- Adjacent to future public square
- Access to Science Center's nationally renowned business acceleration and technology commercialization programs

Drexel University Libraries

Drexel University Libraries (http://www.library.drexel.edu/) is a learning enterprise, advancing the University's academic mission through serving as educators, supporting education and research, collaborating with researchers, and fostering intentional learning outside of the classroom. Drexel University Libraries engages with Drexel communities through three physical locations, including W. W. Hagerty Library, Queen Lane Library, and the Library Learning Terrace, as well as a vibrant online presence which sees, on average, over 8,000 visits per day. In the W.W. Hagerty Library location, College of Computing & Informatics students have access to private study rooms and nearly half a million books, periodicals, DVDs, videos and University Archives. All fields of inquiry are covered, including: library and information science, computer science, software engineering, health informatics, information systems, and computing technology. Resources are available online at library.drexel.edu (http://www.library.drexel.edu/) or in-person at W. W. Hagerty Library (http://www.library.drexel.edu/locations/).

The Libraries also make available laptop and desktop PC and Mac computers, printers and scanners, spaces for quiet work or group projects and designated 24/7 spaces. Librarians and library staff—including a liaison librarian for computing and informatics—are available for individual research consultations and to answer questions about materials or services.

CCI Commons

Located on the 10th floor of 3675 Market Street, the CCI Commons is an open lab and collaborative work environment for students. It features desktop computers, a wireless/laptop area, free black and white printing, and more collaborative space for its students. Students have access to 3675 Market's fully equipped conference room with 42" displays and videoconferencing capabilities. The CCI Commons provides technical support to students, faculty, and professional staff. In addition, the staff provides audio-visual support for all presentation classrooms within 3675 Market. Use of the CCI Commons is reserved for all students taking CCI courses.

The computers for general use are Microsoft Windows and Macintosh OSX machines with appropriate applications which include the Microsoft Office suite, various database management systems, modeling tools, and statistical analysis software. Library related resources may be accessed at the CCI Commons and through the W.W. Hagerty Library. The College is a member of the Rational SEED Program which provides cutting-edge software development and project management software for usage in the CCI Commons and CCI classrooms. The College is also a member of the Microsoft Academic Alliance known also as "DreamSpark" that allows students free access to a wide array of Microsoft software titles and operating systems.

The CCI Commons, student labs, and classrooms have access to networked databases, print and file resources within the College, and the Internet via the University's network. Email accounts, Internet and BannerWeb access are available through the Office of Information Resources and Technology.

CCI Learning Center

The CCI Learning Center (CCILC), located in 3675 Market Street's CCI Commons student computer lab, provides consulting and other learning resources for students taking computer science classes. The CCILC is staffed by graduate and undergraduate computer science students from the College of Computing & Informatics.

The CCILC and CCI Commons serve as a central hub for small group work, student meetings, and TA assistance.

Research Laboratories

The College houses multiple research labs, led by CCI faculty, in 3675 Market Street including: the Drexel Health and Risk Communication Lab, Interactive Systems for Healthcare, Socio-Technical Studies Group, Intelligent Information & Knowledge Computing Research Lab, Evidence-based Decision Making Lab, Applied Symbolic Computation Laboratory (ASYM), High Performance Computing Laboratory (SPIRAL), Drexel Research on Play (RePlay) Laboratory, Software Engineering Research Group (SERG), Social Computing Research Group, Vision and Cognition Laboratory (VisCog) and the Vision and Graphics Laboratory. For more information on these laboratories, please visit the College's research web page (http://cci.drexel.edu/research.aspx).

Evaluations

The College of Computing & Informatics works continually to improve its degree programs. As part of this effort, the Data Science degree is evaluated relative to the following Objectives and Outcomes.

BS Data Science Program Educational Objectives

Within three to five years of graduation, alumni of the program are expected to achieve one or more of the following milestones:

- Be valued contributors to private or public organizations as demonstrated by promotions, increased responsibility, or other professional recognition
- Contribute to professional knowledge as demonstrated by published papers, technical reports, patents, or conference presentations
- Succeed in continuing professional development as demonstrated by completion of graduate studies or professional certifications
- Display commitment and leadership within the professional and community as demonstrated by contributions towards society's greater good and prosperity.

BS Data Science Program Student Outcomes

The program enables students to attain, by the time of graduation

- An ability to apply knowledge of computing and mathematics appropriate to the discipline
- An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
- An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
- An ability to function effectively on teams to accomplish a common goal
- An understanding of professional, ethical, legal, security and social issues
- An ability to communicate effectively with a range of audiences
- An ability to analyze the local and global impact of computing on individuals, organizations, and society
- Recognition of the need for and an ability to engage in continuing professional development
- An ability to use current techniques, skills, and tools necessary for computing practice

Information Science Faculty

Denise E. Agosto, PhD *(Rutgers, The State University of New Jersey)*. Professor. Youth information behaviors, public libraries, multicultural issues in youth library services, and qualitative research methods.

Yuan An, PhD *(University of Toronto, Canada) Director of International Programs*. Associate Professor. Conceptual modeling, schema and ontology mapping, information integration, knowledge representation, requirements engineering, healthcare information systems, semantic web.

Ellen Bass, PhD *(Georgia Institute of Technology) Joint Appointment with the College of Nursing and Health Professions*. Professor. Characterizing human judgement and decision making, modeling human judgement when supported by information automation, computational models of human-human and human-automation coordination.

Christopher Carroll, MS *(Drexel University) BSCST Program Director*. Associate Teaching Professor. Information technology within healthcare companies, computer networking and design, IT infrastructure, server technology, information security, virtualization and cloud computing.

Chaomei Chen, PhD *(University of Liverpool)*. Professor. Information visualization, visual analytics, knowledge domain visualization, network analysis and modeling, scientific discovery, science mapping, scientometrics, citation analysis, human-computer interaction.

Michael Chu, MSE *(University of Pennsylvania)*. Associate Teaching Professor. System, server, computer networking and design; IT infrastructure; information technology management and security; Web system programming; database and mobile application development.

Catherine D. Collins, MLIS *(Indiana University)*. Associate Teaching Professor. Knowledge management, collection development, management of information organizations, information sources and services, international development.

M. Carl Drott, PhD *(University of Michigan)*. Associate Professor. Systems analysis techniques, web usage, competitive intelligence.

Andrea Forte, PhD *(Georgia Institute of Technology) PhD Program Director, and MS in Information Program Director*. Associate Professor. Social computing, human-computer interaction, computer-supported cooperative work, computer-supported collaborative learning, information literacy.

Susan Gasson, PhD *(University of Warwick)*. Associate Professor. The co-design of business and IT-systems, distributed cognition & knowledge management in boundary-spanning groups, human-centered design, social informatics, online learning communities, grounded theory.

Tim Gorichanaz, PhD *(Drexel University)*. Assistant Teaching Professor. Human information behavior, human-centered computing, neo-documentation studies, and information ethics.

Jane Greenberg, PhD *(University of Pittsburgh) Alice B. Kroeger Professor*. Metadata, ontological engineering, data science, knowledge organization, information retrieval

Peter Grillo, PhD *(Temple University) Associate Department Head for Undergraduate Affairs, Information Science*. Teaching Professor. Strategic applications of technology within organizations.

Thomas Heverin, PhD *(Drexel University)*. Associate Teaching Professor. Computer security, ethical hacking, computer forensics, network forensics, cloud security and cybersecurity.

Gregory W. Hislop, PhD *(Drexel University)*. Professor. Information technology for teaching and learning, online education, structure and organization of the information disciplines, computing education research, software evaluation and characterization.

Xiaohua Tony Hu, PhD *(University of Regina, Canada)*. Professor. Data mining, text mining, Web searching and mining, information retrieval, bioinformatics and healthcare informatics.

Weimao Ke, PhD *(University of North Carolina at Chapel Hill)*. Associate Professor. Information retrieval (IR), distributed systems, intelligent filtering/recommendation, information visualization, network science, complex systems, machine learning, text/data mining, multi-agent systems, the notion of information.

Xia Lin, PhD *(University of Maryland) Department Head, Information Science*. Professor. Digital libraries, information visualization, visual interface design, knowledge mapping, human-computer interaction, object-oriented programming, information retrieval, information architecture, information-seeking behaviors in digital environments.

Danuta A. Nitecki, PhD *(University of Maryland at College Park) Dean of Libraries.* Professor. Library metrics and use in management, library as place, and academic library service models.

Jung-ran Park, PhD *(University of Hawaii at Manoa).* Associate Professor. Knowledge organization and representation, metadata, computer-mediated communication, cross-cultural communication, multilingual information access.

Alex Poole, PhD *(University of North Carolina).* Assistant Professor. Digital curation, archives and records management, digital humanities, and diversity, inclusivity, and equity.

Lori Richards, PhD *(University of North Carolina).* Assistant Professor. Archives, digital curation, electronic records management, information technology and digital collections, cloud computing and record keeping, management of information organizations.

Michelle L. Rogers, PhD *(University of Wisconsin-Madison).* Associate Professor. Human-computer interaction, healthcare informatics, human factors engineering, socio-technical systems, health services research, patient safety.

Aleksandra Sarcevic, PhD *(Rutgers University).* Associate Professor. Computer-supported cooperative work, human-computer interaction, and healthcare informatics.

Bupesh Shetty, PhD *(University of Iowa).* Assistant Teaching Professor. Process pattern mining, data mining, operations management, sports analytics, information systems, and machine learning applications.

Brian Smith, PhD *(Northwestern University) Senior Associate Dean of Academic Affairs.* Professor. Design of computer-based learning environments, computer science education, human-computer interaction, creativity and innovation; design sciences; informal/everyday learning.

Il-Yeol Song, PhD *(Louisiana State University).* Professor. Conceptual modeling, ontology and patterns, data warehouse and OLAP, object-oriented analysis and design with UML, medical and bioinformatics data modeling & integration,.

Rosina Weber, PhD *(Federal University of Santa Catarina).* Associate Professor. Case-based reasoning, explainable artificial intelligence, machine learning, textual analytics, natural language understanding, language models, recommender systems, technological aspects of knowledge management, project management, and requirements engineering.

Jake Williams, PhD *(University of Vermont).* Assistant Professor. Data science, scientific programming, computational social science, computational linguistics and natural language processing, mathematics, machine learning, algorithms, and scalability.

Erjia Yan, PhD *(Indiana University Bloomington).* Assistant Professor. Network science, information analysis and retrieval, scholarly communication methods and applications.

Christopher C. Yang, PhD *(University of Arizona, Tucson).* Professor. Web search and mining, security informatics, knowledge management, social media analytics, cross-lingual information retrieval, text summarization, multimedia retrieval, information visualization, information sharing and privacy, artificial intelligence, digital library, and electronic commerce.

Emeritus Faculty

Michael E. Atwood, PhD *(University of Colorado).* Professor Emeritus. Human-computer interaction, computer-supported cooperative work, organizational memory.

Thomas A. Childers, PhD *(Rutgers University).* Professor Emeritus. Measurement, evaluation, and planning of information and library services, the effectiveness of information organizations.

David E. Fenske, PhD *(University of Wisconsin-Madison).* Dean Emeritus and Professor. Digital libraries, informatics, knowledge management and information technologies.

Linda Marion, PhD *(Drexel University).* Teaching Professor Emerita. Formal and informal communication, bibliometric studies of scholarly communication, diffusion of information, information use in the social sciences, academic and public libraries, information science education.

Katherine W. McCain, PhD *(Drexel University).* Professor Emeritus. Scholarly communication, information production and use in the research process, development and structure of scientific specialties, diffusion of innovation, bibliometrics, evaluation of information retrieval systems.

Carol Hansen Montgomery, PhD *(Drexel University) Dean of Libraries Emeritus.* Research Professor. Selection and use of electronic collections, evaluation of library and information systems, digital libraries, economics of libraries and digital collections.

Delia Neuman, PhD *(The Ohio State University).* Professor Emerita. Learning in information-rich environments, instructional systems design, the use of media for learning, and school library media.

Gerry Stahl, PhD *(University of Colorado).* Professor Emeritus. Human-computer interaction, computer-supported cooperative work, computer-supported collaborative learning, theory of collaboration.

Howard D. White, PhD *(University of California at Berkeley).* Professor Emeritus. Literature information systems, bibliometrics, research methods, collection development, online searching.

Susan Wiedenbeck, PhD *(University of Pittsburgh).* Professor Emeritus. Human-computer interaction, end-user programming/end-user development, empirical studies of programmers, interface design and evaluation.

Valerie Ann Yonker, PhD *(Drexel University).* Associate Teaching Professor Emerita. Human service information systems, systems analysis and design, measurement in software evaluation, knowledge engineering.

Information Systems

Major: Information Systems
Degree Awarded: Bachelor of Science Degree in Information Systems (BS)
Calendar Type: Quarter
Total Credit Hours: 187.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 11.0401
Standard Occupational Classification (SOC) code: 11-3021

About the Program

The College of Computing & Informatics' Bachelor of Science in Information Systems (BSIS) prepares students to apply information

technology for the benefit of individuals and organizations. Students develop the skills and knowledge to design, develop, and manage leading-edge information systems. Since many Information Systems students choose careers in business organizations, a minor in business is built into the degree requirements.

The Information Systems curriculum prepares students for a wide range of information technology applications. Students learn how to determine client needs, design appropriate solutions, specify data architectures, and improve the usability of systems.

The core courses in the program address topics including fundamentals of programming, systems analysis and design, database management systems, networking, security and privacy, and social aspects of information systems. These courses provide a foundation for more advanced courses in technical areas of interest to each student. The technical courses are supplemented by courses in business, behavioral sciences, natural sciences, mathematics, and the humanities to provide balance and useful supplemental materials for information systems careers.

The BSIS has four (4) core competencies students will have mastered upon graduation. The core competencies are supported by three (3) courses in each area.

- Requirements and Design

1. INFO 200 *Systems Analysis I*
2. INFO 324 [WI] *Team Process and Product*
3. INFO 355 *System Analysis II*

- Database and Information Management

1. INFO 210 *Database Management Systems*
2. INFO 315 *Advanced Database Management Systems*
3. INFO 371 *Data Mining Applications*

- User Experience

1. INFO 150 *Introduction to Ubiquitous Computing*
2. INFO 310 *Human-Centered Design Process & Methods*
3. INFO 405 *Social and Collaborative Computing*

- Security and Assurance

1. CT 201 *Information Technology Security I*
2. CT 250 *IT Security Awareness*
3. INFO 375 *Introduction to Information Systems Assurance*

The degrees in Computing and Security Technology (p. 185), Data Science (p. 192), and Information Systems share a common first year. This allows students to easily switch among the degrees early in their studies. In addition, some of the electives in each degree are accessible to students in the other two majors, and this provides a deeper and broader set of advanced topics for students in all three majors.

Additional Information

For more information about this program, please visit the BS in Information Systems web page (https://drexel.edu/cci/academics/undergraduate-programs/bs-information-systems/) on the College of Computing & Informatics' website.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Information Systems Requirements		
CT 140	Network Administration I	3.0
CT 201	Information Technology Security I	3.0
CT 250	IT Security Awareness	3.0
INFO 101	Introduction to Computing and Security Technology	3.0
INFO 102	Introduction to Information Systems	3.0
INFO 103	Introduction to Data Science	3.0
INFO 150	Introduction to Ubiquitous Computing	3.0
INFO 200	Systems Analysis I	3.0
INFO 210	Database Management Systems	3.0
INFO 215	Social Aspects of Information Systems	3.0
INFO 310	Human-Centered Design Process & Methods	3.0
INFO 315	Advanced Database Management Systems	3.0
INFO 324 [WI]	Team Process and Product	3.0
INFO 355	Systems Analysis II	3.0
INFO 371	Data Mining Applications	3.0
INFO 375	Introduction to Information Systems Assurance	3.0
INFO 405	Social and Collaborative Computing	3.0
INFO 420	Software Project Management	3.0
INFO/CT Electives [*]		12.0
Programming Requirements		**9.0**
Choose one of the following sequences		
INFO 151 & CS 171 & CS 172	Web Systems and Services I and Computer Programming I and Computer Programming II	
INFO 151 & INFO 152 & INFO 153	Web Systems and Services I and Web Systems and Services II and Applied Data Management	
Computing and Informatics Requirements		
CI 101	Computing and Informatics Design I	2.0
CI 102	Computing and Informatics Design II	2.0
CI 103	Computing and Informatics Design III	2.0
CI 491 [WI]	Senior Project I	3.0
CI 492 [WI]	Senior Project II	3.0
CI 493 [WI]	Senior Project III	3.0
Business or IS Environment Minor Requirements (See Minor Requirements below)		**24.0**
Mathematics Requirements		
Choose 1 of the following sequences:		8.0
If sequence less than 8 credit, add additional 2 credits to free electives		
MATH 171 & MATH 172	Introduction to Analysis A and Introduction to Analysis B	
MATH 101 & MATH 102	Introduction to Analysis I and Introduction to Analysis II	
MATH 121 & MATH 122	Calculus I and Calculus II	
MATH 180	Discrete Computational Structures	4.0
STAT 201	Introduction to Business Statistics	4.0
Natural Science Requirements		
Select 8.0 credits from any non-required courses from the following: ANAT, BIO, CHEM, ENVS, FDSC, NFS, PHEV, PHYS, HSCI, GEO, ENSS		8.0
Liberal Studies Requirements		
COM 230	Techniques of Speaking	3.0
or COM 310	Technical Communication	
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	

ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
Select and non-required courses from ANTH, COM, ENGL, HIST, PHIL, PSCI, PSY, SOC, WRIT, ECON, ENTP, ARTH, FMST, MUSC, TVST, VSST		6.0
University and College Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
UNIV CI101	The Drexel Experience	2.0
or CI 120	CCI Transfer Student Seminar	
Free Electives		**28.0**
Total Credits		187.0

*   Any non-required INFO or CT course

MInor Requirements:

Students must complete the requirements for a minor in an information systems application area. The following minors are approved for this requirement:

- College of Business minors – Note: the MIS minor cannot be used for this requirement due to its considerable overlap with the IS major
- Close School of Entrepreneurship minors
- School of Public Health minors
- Other minors in IS application areas may be taken for this requirement with prior approval of an advisor

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

5 YR UG Co-op Concentration

Term 1		Credits
CI 101	Computing and Informatics Design I	2.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
INFO 101	Introduction to Computing and Security Technology	3.0
INFO 151	Web Systems and Services I	3.0
MATH 171	Introduction to Analysis A	3.0
UNIV CI101	The Drexel Experience	1.0
	Term Credits	15.0
Term 2		
CI 102	Computing and Informatics Design II	2.0
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101[**]	Career Management and Professional Development	0.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
INFO 102	Introduction to Information Systems	3.0
INFO 152 or CS 171	Web Systems and Services II Computer Programming I	3.0
MATH 172	Introduction to Analysis B	3.0
	Term Credits	15.0
Term 3		
CI 103	Computing and Informatics Design III	2.0
COOP 101[**]	Career Management and Professional Development	0.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
INFO 103	Introduction to Data Science	3.0
INFO 153 or CS 172	Applied Data Management Computer Programming II	3.0
MATH 180	Discrete Computational Structures	4.0
UNIV CI101[**]	The Drexel Experience	1.0
	Term Credits	16.0
Term 4		
COM 230 or 310 [WI]	Techniques of Speaking Technical Communication	3.0
CT 201	Information Technology Security I	3.0
INFO 150	Introduction to Ubiquitous Computing	3.0
INFO 200	Systems Analysis I	3.0
INFO 215	Social Aspects of Information Systems	3.0
	Term Credits	15.0
Term 5		
INFO 210	Database Management Systems	3.0
STAT 201	Introduction to Business Statistics	4.0
INFO elective		3.0
Liberal Studies Elective		3.0
Free elective		3.0
	Term Credits	16.0
Term 6		
INFO 315	Advanced Database Management Systems	3.0
INFO 324 [WI]	Team Process and Product	3.0
INFO 371	Data Mining Applications	3.0
INFO 375	Introduction to Information Systems Assurance	3.0
Minor elective		4.0
	Term Credits	16.0
Term 7		
CT 140	Network Administration I	3.0
CT 250	IT Security Awareness	3.0
INFO 310	Human-Centered Design Process & Methods	3.0
Liberal Studies elective		3.0
Minor elective		4.0
	Term Credits	16.0
Term 8		

INFO 355	Systems Analysis II	3.0
Science Sequence Course 1[*]		4.0
Minor elective		4.0
Free elective		6.0
	Term Credits	17.0
Term 9		
INFO 420	Software Project Management	3.0
Science Sequence Course 2[*]		4.0
Minor electives		8.0
	Term Credits	15.0
Term 10		
CI 491 [WI]	Senior Project I	3.0
INFO 405	Social and Collaborative Computing	3.0
INFO electives		6.0
Minor elective		4.0
	Term Credits	16.0
Term 11		
CI 492 [WI]	Senior Project II	3.0
INFO elective		3.0
Free electives		9.0
	Term Credits	15.0
Term 12		
CI 493 [WI]	Senior Project III	3.0
Free electives		12.0
	Term Credits	15.0

Total Credit: 187.0

*   See degree requirements (p. 198).

**   COOP 101 is taken either winter or spring depending on co-op cycle. Please consult your advisor for additional information.

Accelerated Degrees

The College of Computing & Informatics offers several Accelerated Degree programs designed to allow students to complete both a bachelor's degree and a graduate degree along with cooperative educational experience in fewer years than would be typical if pursuing the degrees separately.

Students accepted in this program can combine any of the College's bachelor's and master's degree programs as well as other options:

- Any CCI BS/any CCI MS Accelerated Degree (BS & MS in five years, including 2 Co-ops)
- Any CCI BS/MBA Accelerated Degree (BS/MBA)
- Any CCI BS/JD Accelerated Degree (BS/JD)

For more information on the criteria for entering this program, visit the BS/MS Accelerated Degree (https://drexel.edu/undergrad/academics/accelerated-degrees/) page on Drexel's website.

For more information on how to apply for the BS/MS Accelerated Degree program, please visit the College of Computing & Informatics' website (https://drexel.edu/cci/admissions/undergraduate/admissions-requirements/cci-bsms-degree-admissions/).

Co-op/Career Opportunities

Co-Op Options

Two co-op options are available for this program:

- 5-year/3 co-op
- 4-year/1 co-op
- Accelerated Degree (BS & MS): 5-year/2 co-op

The following list is a sample of recent co-op job titles and employers:

- *Applications Architect,* Aetna
- *e-Communications Intern,* Airgas
- *PC Network Support,* Aramark
- *Information Systems Intern,* Campbell's Soup
- *Distributed WAN Support Co-op,* Cigna
- *Network Services,* GlaxoSmithKline
- *Programmer/Analyst*, Independence Blue Cross
- *Information Management Co-op,* Johnson & Johnson
- *Database Developer,* Princeton Plasma Physics
- *Website Developer,* QVC
- *Shared Services Co-op,* Wyeth

Career Opportunities

The demand for information systems professionals is strong. Graduates find careers in a number of areas, including designing information systems, leading project teams, planning, developing, and marketing information systems. Most information systems students enter the professional world right after graduation, but some continue their studies in advanced information technology programs.

Job titles of recent information systems graduates include:

- Security Analyst
- Network Systems Analyst
- Database Administrator
- Data Communications Analyst
- Systems Administrator
- Systems Engineer

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

3675 Market Street

In March 2019, the College of Computing & Informatics relocated to 3675 Market (https://drexel.edu/cci/about/our-facilities/). For the first time in the College's history, all CCI faculty, students and professional staff are housed under one roof. Occupying two floors in the brand new uCity Square building, CCI's new home offers state-of-the-art technology in our classrooms, labs, meeting areas and collaboration spaces. 3675 Market offers Class A laboratory, office, coworking, and convening spaces. In fall 2019, the College will open a third floor which will include additional offices, classrooms, a research lab, a maker space, and a ground-breaking DXC Technology Innovation Lab. Located at the intersection of Market Street and 37th Street, 3675 Market will act as a physical nexus, bridging academic campuses and medical centers to the east and south, the commercial corridors along Market Street and Chestnut Street, and the residential communities to the north and west.

The uCity Square building offers:

- Speculative lab/office space
- World-class facilities operated by CIC (https://cic.us/philadelphia/)

- Café/restaurant on-site
- Quorum, a two-story, 15K SF convening space and conference center
- Adjacent to future public square
- Access to Science Center's nationally renowned business acceleration and technology commercialization programs

Drexel University Libraries

Drexel University Libraries (http://www.library.drexel.edu/) is a learning enterprise, advancing the University's academic mission through serving as educators, supporting education and research, collaborating with researchers, and fostering intentional learning outside of the classroom. Drexel University Libraries engages with Drexel communities through three physical locations, including W. W. Hagerty Library, Queen Lane Library, and the Library Learning Terrace, as well as a vibrant online presence which sees, on average, over 8,000 visits per day. In the W.W. Hagerty Library location, College of Computing & Informatics students have access to private study rooms and nearly half a million books, periodicals, DVDs, videos and University Archives. All fields of inquiry are covered, including: library and information science, computer science, software engineering, health informatics, information systems, and computing technology. Resources are available online at library.drexel.edu (http://www.library.drexel.edu/) or in-person at W. W. Hagerty Library (http://www.library.drexel.edu/locations/).

The Libraries also make available laptop and desktop PC and Mac computers, printers and scanners, spaces for quiet work or group projects and designated 24/7 spaces. Librarians and library staff—including a liaison librarian for computing and informatics—are available for individual research consultations and to answer questions about materials or services.

CCI Commons

Located on the 10th floor of 3675 Market Street, the CCI Commons is an open lab and collaborative work environment for students. It features desktop computers, a wireless/laptop area, free black and white printing, and more collaborative space for its students. Students have access to 3675 Market's fully equipped conference room with 42" displays and videoconferencing capabilities. The CCI Commons provides technical support to students, faculty, and professional staff. In addition, the staff provides audio-visual support for all presentation classrooms within 3675 Market. Use of the CCI Commons is reserved for all students taking CCI courses.

The computers for general use are Microsoft Windows and Macintosh OSX machines with appropriate applications which include the Microsoft Office suite, various database management systems, modeling tools, and statistical analysis software. Library related resources may be accessed at the CCI Commons and through the W.W. Hagerty Library. The College is a member of the Rational SEED Program which provides cutting-edge software development and project management software for usage in the CCI Commons and CCI classrooms. The College is also a member of the Microsoft Academic Alliance known also as "DreamSpark" that allows students free access to a wide array of Microsoft software titles and operating systems.

The CCI Commons, student labs, and classrooms have access to networked databases, print and file resources within the College, and the Internet via the University's network. Email accounts, Internet and BannerWeb access are available through the Office of Information Resources and Technology.

CCI Learning Center

The CCI Learning Center (CCILC), located in 3675 Market Street's CCI Commons student computer lab, provides consulting and other learning resources for students taking computer science classes. The CCILC is staffed by graduate and undergraduate computer science students from the College of Computing & Informatics.

The CCILC and CCI Commons serve as a central hub for small group work, student meetings, and TA assistance.

Research Laboratories

The College houses multiple research labs, led by CCI faculty, in 3675 Market Street including: the Drexel Health and Risk Communication Lab, Interactive Systems for Healthcare, Socio-Technical Studies Group, Intelligent Information & Knowledge Computing Research Lab, Evidence-based Decision Making Lab, Applied Symbolic Computation Laboratory (ASYM), High Performance Computing Laboratory (SPIRAL), Drexel Research on Play (RePlay) Laboratory, Software Engineering Research Group (SERG), Social Computing Research Group, Vision and Cognition Laboratory (VisCog) and the Vision and Graphics Laboratory. For more information on these laboratories, please visit the College's research web page (http://cci.drexel.edu/research.aspx).

Evaluations

The College of Computing & Informatics works continually to improve its degree programs. As part of this effort, the Information Systems degree is evaluated relative to the following Objectives and Outcomes.

BS in Information Systems Program Educational Objectives

Within three to five years of graduating, alumni of the program are expected to achieve one or more of the following milestones:

a. Be valued contributors to private or public organizations as demonstrated by promotions, increased responsibility, or other professional recognition
b. Contribute to professional knowledge as demonstrated by published papers, technical reports, patents, or conference presentations
c. Succeed in continuing professional development as demonstrated by completion of graduate studies or professional certifications
d. Demonstrate commitment and leadership within their profession and community as demonstrated by professional and community activity or contributions towards society's greater good and prosperity

BS in Information Systems Student Outcomes

The program enables students to attain, by the time of graduation:

a. An ability to apply knowledge of computing and mathematics appropriate to the discipline
b. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
c. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
d. An ability to function effectively on teams to accomplish a common goal
e. An understanding of professional, ethical, legal, security and social issues
f. An ability to communicate effectively with a range of audiences

g. An ability to analyze the local and global impact of computing on individuals, organizations, and society

h. Recognition of the need for and an ability to engage in continuing professional development

i. An ability to use current techniques, skills, and tools necessary for computing practice.

j. An understanding of processes that support the delivery and management of information systems within a specific application environment

The BSIS is accredited by the Computing Accreditation Commission (CAC) of ABET, http://www.abet.org.

To view the latest BS in Information Systems program enrollment numbers, please click here (https://drexel.edu/cci/academics/undergraduate-programs/facts/).

Computing & Informatics Faculty

Denise E. Agosto, PhD *(Rutgers, The State University of New Jersey)*. Professor. Youth information behaviors, public libraries, multicultural issues in youth library services, and qualitative research methods.

Yuan An, PhD *(University of Toronto, Canada) Director of International Programs*. Associate Professor. Conceptual modeling, schema and ontology mapping, information integration, knowledge representation, requirements engineering, healthcare information systems, semantic web.

David Augenblick, MS *(University of Pennsylvania)*. Associate Teaching Professor. Introductory and object-oriented programming, data structures and database systems, computer application project management, application of computer programming principles and solutions to engineering problems.

Marcello Balduccini, PhD *(Texas Tech University) Senior Research Scientist, Applied Informatics Group*. Associate Research Professor. Logic programming, declarative programming, answer set programming, knowledge representation, various types of reasoning

Ellen Bass, PhD *(Georgia Institute of Technology) Joint Appointment with the College of Nursing and Health Professions*. Professor. Characterizing human judgement and decision making, modeling human judgement when supported by information automation, computational models of human-human and human-automation coordination.

Mark Boady, PhD *(Drexel University)*. Assistant Teaching Professor. Computer Algebra, complex symbolic calculations, automation of computation problems

David E. Breen, PhD *(Rensselaer Polytechnic Institute)*. Associate Professor. Self-organization, biomedical image/video analysis, biological simulation, geometric modeling and visualization

Matthew Burlick, PhD *(Stevens Institute of Technology)*. Assistant Teaching Professor. Image processing, machine learning, real-time video tracking, object detection and classification, statistics/probability, and acoustics

Yuanfang Cai, PhD *(University of Virginia)*. Associate Professor. Formal software design modeling and analysis, software economics, software evolution and modularity.

Christopher Carroll, MS *(Drexel University) BSCST Program Director*. Associate Teaching Professor. Information technology within healthcare companies, computer networking and design, IT infrastructure, server technology, information security, virtualization and cloud computing.

Bruce W. Char, PhD *(University of California-Berkeley)*. Professor. Symbolic mathematical computation, algorithms and systems for computer algebra, problem-solving environments parallel and distributed computation.

Chaomei Chen, PhD *(University of Liverpool)*. Professor. Information visualization, visual analytics, knowledge domain visualization, network analysis and modeling, scientific discovery, science mapping, scientometrics, citation analysis, human-computer interaction.

Catherine D. Collins, MLIS *(Indiana University)*. Associate Teaching Professor. Knowledge management, collection development, management of information organizations, information sources and services, international development.

M. Carl Drott, PhD *(University of Michigan)*. Associate Professor. Systems analysis techniques, web usage, competitive intelligence.

Andrea Forte, PhD *(Georgia Institute of Technology) PhD Program Director, and MS in Information Program Director*. Associate Professor. Social computing, human-computer interaction, computer-supported cooperative work, computer-supported collaborative learning, information literacy.

Susan Gasson, PhD *(University of Warwick)*. Associate Professor. The co-design of business and IT-systems, distributed cognition & knowledge management in boundary-spanning groups, human-centered design, social informatics, online learning communities, grounded theory.

Christopher Geib, PhD *(University of Edinburgh)*. Associate Professor. Decision making and reasoning under conditions of uncertainty, planning, scheduling, constraint, based reasoning, human computer and robot interaction, probabilistic reasoning, computer network security, large scale process control, user interfaces.

Colin Gordon, PhD *(University of Washington)*. Assistant Professor. Software reliability, program behavior, concurrent and systems-level code, formal assurance, programming models, distributed computing, even testing

Jane Greenberg, PhD *(University of Pittsburgh) Alice B. Kroeger Professor*. Metadata, ontological engineering, data science, knowledge organization, information retrieval

Peter Grillo, PhD *(Temple University) Associate Department Head for Undergraduate Affairs, Information Science*. Teaching Professor. Strategic applications of technology within organizations.

Jeremy R. Johnson, PhD *(Ohio State University)*. Professor. Computer algebra; parallel computations; algebraic algorithms; scientific computing.

Xia Lin, PhD *(University of Maryland) Department Head, Information Science*. Professor. Digital libraries, information visualization, visual interface design, knowledge mapping, human-computer interaction, object-oriented programming, information retrieval, information architecture, information-seeking behaviors in digital environments.

Geoffrey Mainland, PhD *(Harvard University)*. Assistant Professor. High-level programming languages and runtime support for non-general purpose computation.

Spiros Mancoridis, PhD *(University of Toronto) The Auerbach Berger Chair in Cybersecurity Distinguished Professor of Computer Science*.

Professor. Software engineering; software security; code analysis; evolutionary computation.

Gabriela Marcu, PhD *(Carnegie Mellon University)*. Assistant Teaching Professor. Human-computer interaction, health informatics, action research, ethnography, user experience design, designing for social change, organizational information systems, ubiquitous computing, knowledge management.

Adelaida Alban Medlock, MS *(Drexel University)*. Associate Teaching Professor. Introductory programming; computer science education.

William Mongan, MS *(Drexel University) Associate Department Head for Undergraduate Affairs, Computer Science*. Associate Teaching Professor. Service-oriented architectures, program comprehension, reverse engineering, software engineering, computer architecture, computer science education, engineering education outreach

Ko Nishino, PhD *(University of Tokyo) Associate Department Head for Graduate Affairs, Computer Science*. Professor. Computer vision, computer graphics, analysis and synthesis of visual appearance.

Danuta A. Nitecki, PhD *(University of Maryland at College Park) Dean of Libraries.* Professor. Library metrics and use in management, library as place, and academic library service models.

Krzysztof Nowak, PhD *(Washington University)*. Associate Teaching Professor. Fourier analysis, partial differential equations, image processing, wavelets, asymptotic distribution of eigenvalues, numerical methods and algorithms, computer science education.

Santiago Ontañón, PhD *(University of Barcelona)*. Assistant Professor. Game AI, computer games, artificial intelligence, machine learning, case-based reasoning

Jung-ran Park, PhD *(University of Hawaii at Manoa)*. Associate Professor. Knowledge organization and representation, metadata, computer-mediated communication, cross-cultural communication, multilingual information access.

Alex Poole, PhD *(University of North Carolina)*. Assistant Professor. Digital curation, archives and records management, digital humanities, and diversity, inclusivity, and equity.

Jeffrey L. Popyack, PhD *(University of Virginia)*. Professor. Operations research, stochastic optimization, computational methods of Markov decision processes; artificial intelligence, computer science education.

Lori Richards, PhD *(University of North Carolina)*. Assistant Professor. Archives, digital curation, electronic records management, information technology and digital collections, cloud computing and record keeping, management of information organizations.

Michelle L. Rogers, PhD *(University of Wisconsin-Madison)*. Associate Professor. Human-computer interaction, healthcare informatics, human factors engineering, socio-technical systems, health services research, patient safety.

Jeffrey Salvage, MS *(Drexel University)*. Teaching Professor. Object-oriented programming, multi-agent systems, software engineering, database theory, introductory programming, data structures.

Dario Salvucci, PhD *(Carnegie Mellon University) Department Head, Computer Science*. Professor. Human computer interaction, cognitive science, machine learning, applications for driving.

Kurt Schmidt, MS *(Drexel University)*. Associate Teaching Professor. Data structures, math foundations for computer science, programming tools, programming languages.

Ali Shokoufandeh, PhD *(Rutgers University) Senior Associate Dean of Research*. Professor. Theory of algorithms, graph theory, combinational optimization, computer vision.

Erin Solovey, PhD *(Tufts University)*. Assistant Professor. Human-computer interaction, brain-computer interfaces, tangible interaction, machine learning, human interaction with complex and autonomous systems.

Il-Yeol Song, PhD *(Louisiana State University)*. Professor. Conceptual modeling, ontology and patterns, data warehouse and OLAP, object-oriented analysis and design with UML, medical and bioinformatics data modeling & integration,.

Julia Stoyanovich, PhD *(Columbia University)*. Assistant Professor. Data and knowledge management, big data, biological data management, search and ranking.

Brian Stuart, PhD *(Purdue University)*. Associate Teaching Professor. Machine learning, networking, robotics, image processing, simulation, interpreters, data storage, operating systems, computer science, data communications, distributed/operating systems, accelerated computer programming, computer graphics.

Filippos Vokolos, PhD *(Polytechnic University)*. Assistant Teaching Professor. System architecture, principles of software design and construction, verification and validation methods for the development of large software systems, foundations of software engineering, software verification & validation, software design, programming languages, dependable software systems.

Rosina Weber, PhD *(Federal University of Santa Catarina)*. Associate Professor. Case-based reasoning, explainable artificial intelligence, machine learning, textual analytics, natural language understanding, language models, recommender systems, technological aspects of knowledge management, project management, and requirements engineering.

Erija Yan, PhD *(Indiana University)*. Assistant Professor. Network Science, information analysis and retrieval, scholarly communication methods and applications.

Emeritus Faculty

Michael E. Atwood, PhD *(University of Colorado)*. Professor Emeritus. Human-computer interaction, computer-supported cooperative work, organizational memory.

Thomas A. Childers, PhD *(Rutgers University)*. Professor Emeritus. Measurement, evaluation, and planning of information and library services, the effectiveness of information organizations.

David E. Fenske, PhD *(University of Wisconsin-Madison)*. Dean Emeritus and Professor. Digital libraries, informatics, knowledge management and information technologies.

John B. Hall, PhD *(Florida State University)*. Professor Emeritus. Academic library service, library administration, organization of materials.

Katherine W. McCain, PhD *(Drexel University)*. Professor Emeritus. Scholarly communication, information production and use in the research

process, development and structure of scientific specialties, diffusion of innovation, bibliometrics, evaluation of information retrieval systems.

Carol Hansen Montgomery, PhD *(Drexel University) Dean of Libraries Emeritus*. Research Professor. Selection and use of electronic collections, evaluation of library and information systems, digital libraries, economics of libraries and digital collections.

Delia Neuman, PhD *(The Ohio State University)*. Professor Emerita. Learning in information-rich environments, instructional systems design, the use of media for learning, and school library media.

Gerry Stahl, PhD *(University of Colorado)*. Professor Emeritus. Human-computer interaction, computer-supported cooperative work, computer-supported collaborative learning, theory of collaboration.

Howard D. White, PhD *(University of California at Berkeley)*. Professor Emeritus. Literature information systems, bibliometrics, research methods, collection development, online searching.

Susan Wiedenbeck, PhD *(University of Pittsburgh)*. Professor Emeritus. Human-computer interaction, end-user programming/end-user development, empirical studies of programmers, interface design and evaluation.

Software Engineering

Major: Software Engineering
Degree Awarded: Bachelor of Science in Software Engineering (BSSE)
Calendar Type: Quarter
Total Credit Hours: 188.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years)
Classification of Instructional Program (CIP) code: 14.0903
Standard Occupational Classification (SOC) code: *15-1132; 15-1133*

About the Program

The College of Computing & Informatics' Bachelor of Science in Software Engineering (BSSE) prepares students to design and build software systems. Software is essential to the functioning of modern society but high quality software is very challenging to create. Software engineering focuses on the knowledge and skills to meet that challenge and create high quality software on schedule within budget.

The Software Engineering curriculum addresses a full range of software activities including gathering client requirements, designing and constructing software solutions, testing software, and modifying and extending existing systems. The curriculum also recognizes that most software is developed by teams, and students develop skills in project management and team operation. Graduates are well-prepared to function as software engineering team members and also move toward software engineering management.

The core courses address programming and use of software development tools, specification and design, software architecture, verification and validation, software evolution, and team projects. These courses are supplemented with courses drawn from computer science and Informatics that provide theoretical background and application knowledge. The full curriculum prepares BSSE students to apply processes, methods, and tools to the problem of building and maintaining software with a defined level of quality, at a predictable cost, on a predictable schedule.

Additional Information

For more information about this program, please visit the BS in Software Engineering web page (https://drexel.edu/cci/academics/undergraduate-programs/bs-software-engineering/) on the College of Computing & Informatics' website.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

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Software Engineering Requirements		
CS 164	Introduction to Computer Science	3.0
CS 171	Computer Programming I	3.0
or CS 175	Advanced Computer Programming I	
CS 172	Computer Programming II	3.0
or CS 176	Advanced Computer Programming II	
SE 210	Software Specification and Design I	3.0
SE 181	Introduction to Software Engineering and Development	3.0
SE 211	Software Specification and Design II	3.0
SE 310	Software Architecture I	3.0
SE 311	Software Architecture II	3.0
SE 320	Software Verification and Validation	3.0
SE 410	Software Evolution	3.0
Computer Science Requirements		
CS 260	Data Structures	3.0
CS 265	Advanced Programming Tools and Techniques	3.0
CS 281	Systems Architecture	4.0
CS 283	Systems Programming	3.0
CS 472	Computer Networks: Theory, Applications and Programming	3.0
Information Systems Requirements		
INFO 210	Database Management Systems	3.0
INFO 310	Human-Centered Design Process & Methods	3.0
INFO 420	Software Project Management	3.0
Computing & Informatics Requirements		
CI 101	Computing and Informatics Design I	2.0
CI 102	Computing and Informatics Design II	2.0
CI 103	Computing and Informatics Design III	2.0
CI 491 [WI]	Senior Project I	3.0
CI 492 [WI]	Senior Project II	3.0
CI 493 [WI]	Senior Project III	3.0
Computing & Informatics Electives (see below)		**18.0**
Mathematics Requirements		
CS 270	Mathematical Foundations of Computer Science	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
MATH 221	Discrete Mathematics	3.0
STAT 201	Introduction to Business Statistics	4.0
STAT 202	Business Statistics II	4.0
Science Requirements		**18.0**
Select one of the following lab science sequences:		
BIO 122	Cells and Genetics	
& BIO 124	and Evolution & Organismal Diversity	
& BIO 126	and Physiology and Ecology	
CHEM 101	General Chemistry I	
& CHEM 102	and General Chemistry II	
& CHEM 103	and General Chemistry III	
PHYS 101	Fundamentals of Physics I	
& PHYS 102	and Fundamentals of Physics II	
& PHYS 201	and Fundamentals of Physics III	

Additional Science electives to reach 21 credits (see below)

Arts & Humanities Requirements		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 105	Critical Reasoning	3.0
PHIL 311	Ethics and Information Technology	3.0
COM 230	Techniques of Speaking	3.0
COM 310 [WI]	Technical Communication	3.0
PSY 101	General Psychology I	3.0
PSY 330	Cognitive Psychology	3.0
Select two of the following:		8.0
ACCT 110	Accounting for Professionals	
ECON 201	Principles of Microeconomics	
ECON 202	Principles of Macroeconomics	
Arts & Humanities, Business, or Social Studies elective (see below)		3.0
University Requirements		
UNIV CI101	The Drexel Experience	2.0
or CI 120	CCI Transfer Student Seminar	
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
Free Electives		**13.5**
Total Credits		186.5

Program Electives

Independent study courses and special topics courses must be approved by the department prior to enrollment to satisfy a program elective requirement.

- **Computing & Informatics electives**: any non-required CS, INFO, SE course numbered 300 or higher; a well as CT 210, CT 200, CT 320, CT 330
- **Science electives**: any CHEM (except CHEM 111, CHEM 112, CHEM 113, CHEM 114, CHEM 151), BIO (except BIO 161, BIO 162, BIO 163; can take only one of BIO 100, BIO 107, BIO 122; can take only one of BIO 101, BIO 109, BIO 124), PHYS (except PHYS 050, PHYS 100, PHYS 103, PHYS 104, PHYS 105, PHYS 106 [WI] , PHYS 121, PHYS 122, PHYS 151, PHYS 160, PHYS 305, PHYS 324, PHYS 405; cannot take both PHYS 131 and PHYS 181), ENVS, ENSS, PHEV.
- **Business electives**: any ACCT, BLAW, BUSN, ECON, ENTP, FIN, HRMT, INTB, MGMT, MIS, MKTG, OPM, OPR, ORGB, STAT, TAX
- **Social Studies electives**: any AFAS, ANTH, HIST, GST, JUDA, PSCI, PSY (except PSY 332, PSY 337), SOC (except SOC 364, SOC 365), WGST
- **Arts & Humanities electives**: any ARCH, ARTH, CMGT, CJS, COM, CULA, DANC, EDEX, EDUC, ENGL (except ENGL 101, ENGL 102, ENGL 103, ENGL 105), ESTM, FASH, FMST, FMVD, GST, INTR, LING, MUSC, PHIL, PHTO, THTR, VSCM, VSST, WRIT, Foreign Language courses (http://www.drexel.edu/culturecomm/academics/undergraduate/modernlang/languages/) as defined by the College of Arts and Sciences, and GMAP 260, ANIM 140, ANIM 141, ANIM 211, ANIM 212

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

5 YR UG Co-op Concentration

5 YR UG Co-op Concentration

Term 1		Credits
CI 101	Computing and Informatics Design I	2.0
CS 164	Introduction to Computer Science	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121	Calculus I	4.0
UNIV CI101	The Drexel Experience	1.0
Science lab		4.0
	Term Credits	17.0
Term 2		
CI 102	Computing and Informatics Design II	2.0
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
CS 171 or 175	Computer Programming I Advanced Computer Programming I	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122	Calculus II	4.0
Science lab		4.0
	Term Credits	17.0
Term 3		
CI 103	Computing and Informatics Design III	2.0
CS 172 or 176	Computer Programming II Advanced Computer Programming II	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 123	Calculus III	4.0
UNIV CI101	The Drexel Experience	1.0
Science lab		4.0
	Term Credits	17.0
Term 4		
COM 230	Techniques of Speaking	3.0

CS 265	Advanced Programming Tools and Techniques	3.0
CS 270	Mathematical Foundations of Computer Science	3.0
SE 181	Introduction to Software Engineering and Development	3.0
SE 210	Software Specification and Design I	3.0
	Term Credits	15.0
Term 5		
CS 260	Data Structures	3.0
INFO 210	Database Management Systems	3.0
MATH 221	Discrete Mathematics	3.0
SE 211	Software Specification and Design II	3.0
Science elective		3.0
	Term Credits	15.0
Term 6		
COM 310 [WI]	Technical Communication	3.0
CS 281	Systems Architecture	4.0
PSY 101	General Psychology I	3.0
SE 310	Software Architecture I	3.0
STAT 201	Introduction to Business Statistics	4.0
	Term Credits	17.0
Term 7		
CS 283	Systems Programming	3.0
SE 311	Software Architecture II	3.0
STAT 202	Business Statistics II	4.0
Science elective		3.0
Free elective		3.0
	Term Credits	16.0
Term 8		
INFO 420	Software Project Management	3.0
PHIL 105	Critical Reasoning	3.0
SE 320	Software Verification and Validation	3.0
Computing & Informatics elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 9		
INFO 310	Human-Centered Design Process & Methods	3.0
PHIL 311	Ethics and Information Technology	3.0
SE 410	Software Evolution	3.0
Computing & Informatics elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 10		
CI 491 [WI]	Senior Project I	3.0
CS 472	Computer Networks: Theory, Applications and Programming	3.0
Select one of the following:		4.0
ACCT 110	Accounting for Professionals	
ECON 201	Principles of Microeconomics	
ECON 202	Principles of Macroeconomics	
Computing & Informatics elective		3.0
Free elective		1.0
	Term Credits	14.0
Term 11		
CI 492 [WI]	Senior Project II	3.0
PSY 330	Cognitive Psychology	3.0
Select one of the following:		4.0
ACCT 110	Accounting for Professionals	
ECON 202	Principles of Macroeconomics	
ECON 201	Principles of Microeconomics	
Computing & Informatics electives		6.0
	Term Credits	16.0
Term 12		
CI 493 [WI]	Senior Project III	3.0

Computing & Informatics elective	3.0
Arts & Humanities elective	3.0
Free elective	3.5
Term Credits	12.5

Total Credit: 186.5

Accelerated Degrees

The College of Computing & Informatics offers several accelerated degree programs designed to allow students to complete both a bachelor's degree and a graduate degree along with cooperative educational experience in fewer years than would be typical if pursuing the degrees separately.

Students accepted in this program can combine any of the Computing and Informatics bachelor's and master's degree programs as well as other options:

- Any CCI BS/any CCI MS Accelerated Degree (BS & MS in five years, including 2 Co-ops)
- Any CCI BS /MBA Accelerated Degree (BS/MBA) (BS & MBA in four years, including 1 Co-op option only)
- Any CCI BS/JD Accelerated Degree (BS/JD)

For more information on the criteria for entering this program, visit the BS/MS Accelerated Degree (http://drexel.edu/undergrad/academics/accelerated-degrees/) page on the Drexel website.

For more information on how to apply for the BS/MS Accelerated Degree program, please visit the College of Computing & Informatics' website (https://drexel.edu/cci/admissions/undergraduate/admissions-requirements/cci-bsms-degree-admissions/).

Co-op/Career Opportunities
Co-Op Options

Three co-op options are available for this program:

- 5-year/3 co-op
- 4-year/1 co-op
- Accelerated Degree: 5-year/2 co-op

Career Opportunities

The demand for software engineering professionals is quite strong. Graduates can expect career opportunities in software design and development in a variety of application areas. Software engineering graduates are particularly well suited to work as members or leaders of software project teams. They have knowledge and skills to help them develop quality software within schedule and cost constraints.

According to the U.S. Bureau of Labor Statistics' Occupational Outlook Handbook (http://www.bls.gov/ooh/), software developer is among the fastest growing U.S. careers requiring at least a bachelor's degree, with an estimated 302,500 new jobs by 2026. Although they have jobs in most industries, many software developers work in computer systems design and related services firms or software publishers. The field's rapid growth is mainly due to the increase in demand for computer software, especially in healthcare.

Most software engineering students enter the professional world right after graduation, but some continue their studies in advanced software engineering programs.

Job titles of recent software engineering graduates include:

- Software Engineer
- Software Architect
- Software System Project Manager
- Software Project Team Leader

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

3675 Market Street

In March 2019, the College of Computing & Informatics relocated to 3675 Market (https://drexel.edu/cci/about/our-facilities/). For the first time in the College's history, all CCI faculty, students and professional staff are housed under one roof. Occupying two floors in the brand new uCity Square building, CCI's new home offers state-of-the-art technology in our classrooms, labs, meeting areas and collaboration spaces. 3675 Market offers Class A laboratory, office, coworking, and convening spaces. In fall 2019, the College will open a third floor which will include additional offices, classrooms, a research lab, a maker space, and a ground-breaking DXC Technology Innovation Lab. Located at the intersection of Market Street and 37th Street, 3675 Market will act as a physical nexus, bridging academic campuses and medical centers to the east and south, the commercial corridors along Market Street and Chestnut Street, and the residential communities to the north and west.

The uCity Square building offers:

- Speculative lab/office space
- World-class facilities operated by CIC (https://cic.us/philadelphia/)
- Café/restaurant on-site
- Quorum, a two-story, 15K SF convening space and conference center
- Adjacent to future public square
- Access to Science Center's nationally renowned business acceleration and technology commercialization programs

Drexel University Libraries

Drexel University Libraries (http://www.library.drexel.edu/) is a learning enterprise, advancing the University's academic mission through serving as educators, supporting education and research, collaborating with researchers, and fostering intentional learning outside of the classroom. Drexel University Libraries engages with Drexel communities through three physical locations, including W. W. Hagerty Library, Queen Lane Library, and the Library Learning Terrace, as well as a vibrant online presence which sees, on average, over 8,000 visits per day. In the W.W. Hagerty Library location, College of Computing & Informatics students have access to private study rooms and nearly half a million books, periodicals, DVDs, videos and University Archives. All fields of inquiry are covered, including: library and information science, computer science, software engineering, health informatics, information systems, and computing technology. Resources are available online at library.drexel.edu (http://www.library.drexel.edu/) or in-person at W. W. Hagerty Library (http://www.library.drexel.edu/locations/).

The Libraries also make available laptop and desktop PC and Mac computers, printers and scanners, spaces for quiet work or group projects and designated 24/7 spaces. Librarians and library staff—including a liaison librarian for computing and informatics—are available for individual research consultations and to answer questions about materials or services.

CCI Commons

Located on the 10th floor of 3675 Market Street, the CCI Commons is an open lab and collaborative work environment for students. It features desktop computers, a wireless/laptop area, free black and white printing, and more collaborative space for its students. Students have access to 3675 Market's fully equipped conference room with 42" displays and videoconferencing capabilities. The CCI Commons provides technical support to students, faculty, and professional staff. In addition, the staff provides audio-visual support for all presentation classrooms within 3675 Market. Use of the CCI Commons is reserved for all students taking CCI courses.

The computers for general use are Microsoft Windows and Macintosh OSX machines with appropriate applications which include the Microsoft Office suite, various database management systems, modeling tools, and statistical analysis software. Library related resources may be accessed at the CCI Commons and through the W.W. Hagerty Library. The College is a member of the Rational SEED Program which provides cutting-edge software development and project management software for usage in the CCI Commons and CCI classrooms. The College is also a member of the Microsoft Academic Alliance known also as "DreamSpark" that allows students free access to a wide array of Microsoft software titles and operating systems.

The CCI Commons, student labs, and classrooms have access to networked databases, print and file resources within the College, and the Internet via the University's network. Email accounts, Internet and BannerWeb access are available through the Office of Information Resources and Technology.

CCI Learning Center

The CCI Learning Center (CCILC), located in 3675 Market Street's CCI Commons student computer lab, provides consulting and other learning resources for students taking computer science classes. The CCILC is staffed by graduate and undergraduate computer science students from the College of Computing & Informatics.

The CCILC and CCI Commons serve as a central hub for small group work, student meetings, and TA assistance.

Research Laboratories

The College houses multiple research labs, led by CCI faculty, in 3675 Market Street including: the Drexel Health and Risk Communication Lab, Interactive Systems for Healthcare, Socio-Technical Studies Group, Intelligent Information & Knowledge Computing Research Lab, Evidence-based Decision Making Lab, Applied Symbolic Computation Laboratory (ASYM), High Performance Computing Laboratory (SPIRAL), Drexel Research on Play (RePlay) Laboratory, Software Engineering Research Group (SERG), Social Computing Research Group, Vision and Cognition Laboratory (VisCog) and the Vision and Graphics Laboratory. For more information on these laboratories, please visit the College's research web page (http://cci.drexel.edu/research.aspx).

Evaluations

The College of Computing & Informatics works continually to improve its degree programs. As part of this effort, the software engineering degree is evaluated relative to the following Objectives and Outcomes.

Program Educational Objectives

Within three to five years of graduating, alumni of the program are expected to achieve one or more of the following milestones:

a. Graduates of the program obtain employment as software developers, where their software and communication skills eventually propel them toward technical and administrative leadership positions in industry and government.

b. Graduates of the program demonstrate an ability to continue to learn throughout their career and to keep pace with changing technology as appropriate to their positions.

c. Graduates of the program specialize and enhance their software engineering knowledge by enrolling and completing technical graduate courses and other technical education to position them to advance software engineering practice as senior technical staff members or managers.

d. Graduates of the program specialize and enhance their software engineering knowledge by enrolling and graduating from MSc and PhD degree programs to position them to contribute to the intellectual foundations of the discipline of software engineering as researchers in industrial and government laboratories as well as in academia.

e. Graduates of the program advance toward becoming leaders in disciplines other than software engineering by enrolling and graduating from graduate-level degree programs in complimentary disciplines such as law and business, where the BSSE serves as an educational foundation.

f. Graduates of the program will demonstrate an awareness of their professional and social responsibility as software engineers by participation in professional activities and application of their knowledge for the good of society.

Software Engineering Student Outcomes

The program enables students to attain, by the time of graduation:

a. An ability to apply knowledge of mathematics, science and engineering

b. An ability to design and conduct experiments, as well as to analyze and interpret data

c. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability

d. An ability to function on multidisciplinary teams

e. An ability to identify, formulate and solve engineering problems

f. An understanding of professional and ethical responsibility

g. An ability to communicate effectively

h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context

i. A recognition of the need for, and an ability to engage in life-long learning

j. A knowledge of contemporary issues

k. An ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

Additional Information

The Software Engineering program is accredited by the Engineering Accreditation Commission (EAC) of ABET (http://www.abet.org).

To view the latest BS in Software Engineering program enrollment numbers, please click here (https://drexel.edu/cci/academics/undergraduate-programs/facts/).

Computing & Informatics Faculty

Denise E. Agosto, PhD *(Rutgers, The State University of New Jersey)*. Professor. Youth information behaviors, public libraries, multicultural issues in youth library services, and qualitative research methods.

Yuan An, PhD *(University of Toronto, Canada) Director of International Programs*. Associate Professor. Conceptual modeling, schema and ontology mapping, information integration, knowledge representation, requirements engineering, healthcare information systems, semantic web.

David Augenblick, MS *(University of Pennsylvania)*. Associate Teaching Professor. Introductory and object-oriented programming, data structures and database systems, computer application project management, application of computer programming principles and solutions to engineering problems.

Marcello Balduccini, PhD *(Texas Tech University) Senior Research Scientist, Applied Informatics Group*. Associate Research Professor. Logic programming, declarative programming, answer set programming, knowledge representation, various types of reasoning

Ellen Bass, PhD *(Georgia Institute of Technology) Joint Appointment with the College of Nursing and Health Professions*. Professor. Characterizing human judgement and decision making, modeling human judgement when supported by information automation, computational models of human-human and human-automation coordination.

Mark Boady, PhD *(Drexel University)*. Assistant Teaching Professor. Computer Algebra, complex symbolic calculations, automation of computation problems

David E. Breen, PhD *(Rensselaer Polytechnic Institute)*. Associate Professor. Self-organization, biomedical image/video analysis, biological simulation, geometric modeling and visualization

Matthew Burlick, PhD *(Stevens Institute of Technology)*. Assistant Teaching Professor. Image processing, machine learning, real-time video tracking, object detection and classification, statistics/probability, and acoustics

Yuanfang Cai, PhD *(University of Virginia)*. Associate Professor. Formal software design modeling and analysis, software economics, software evolution and modularity.

Christopher Carroll, MS *(Drexel University) BSCST Program Director*. Associate Teaching Professor. Information technology within healthcare companies, computer networking and design, IT infrastructure, server technology, information security, virtualization and cloud computing.

Bruce W. Char, PhD *(University of California-Berkeley)*. Professor. Symbolic mathematical computation, algorithms and systems for computer algebra, problem-solving environments parallel and distributed computation.

Chaomei Chen, PhD *(University of Liverpool)*. Professor. Information visualization, visual analytics, knowledge domain visualization,

network analysis and modeling, scientific discovery, science mapping, scientometrics, citation analysis, human-computer interaction.

Catherine D. Collins, MLIS *(Indiana University)*. Associate Teaching Professor. Knowledge management, collection development, management of information organizations, information sources and services, international development.

M. Carl Drott, PhD *(University of Michigan)*. Associate Professor. Systems analysis techniques, web usage, competitive intelligence.

Andrea Forte, PhD *(Georgia Institute of Technology) PhD Program Director, and MS in Information Program Director*. Associate Professor. Social computing, human-computer interaction, computer-supported cooperative work, computer-supported collaborative learning, information literacy.

Susan Gasson, PhD *(University of Warwick)*. Associate Professor. The co-design of business and IT-systems, distributed cognition & knowledge management in boundary-spanning groups, human-centered design, social informatics, online learning communities, grounded theory.

Christopher Geib, PhD *(University of Edinburgh)*. Associate Professor. Decision making and reasoning under conditions of uncertainty, planning, scheduling, constraint, based reasoning, human computer and robot interaction, probabilistic reasoning, computer network security, large scale process control, user interfaces.

Colin Gordon, PhD *(University of Washington)*. Assistant Professor. Software reliability, program behavior, concurrent and systems-level code, formal assurance, programming models, distributed computing, even testing

Jane Greenberg, PhD *(University of Pittsburgh) Alice B. Kroeger Professor*. Metadata, ontological engineering, data science, knowledge organization, information retrieval

Peter Grillo, PhD *(Temple University) Associate Department Head for Undergraduate Affairs, Information Science*. Teaching Professor. Strategic applications of technology within organizations.

Jeremy R. Johnson, PhD *(Ohio State University)*. Professor. Computer algebra; parallel computations; algebraic algorithms; scientific computing.

Xia Lin, PhD *(University of Maryland) Department Head, Information Science*. Professor. Digital libraries, information visualization, visual interface design, knowledge mapping, human-computer interaction, object-oriented programming, information retrieval, information architecture, information-seeking behaviors in digital environments.

Geoffrey Mainland, PhD *(Harvard University)*. Assistant Professor. High-level programming languages and runtime support for non-general purpose computation.

Spiros Mancoridis, PhD *(University of Toronto) The Auerbach Berger Chair in Cybersecurity Distinguished Professor of Computer Science*. Professor. Software engineering; software security; code analysis; evolutionary computation.

Gabriela Marcu, PhD *(Carnegie Mellon University)*. Assistant Teaching Professor. Human-computer interaction, health informatics, action research, ethnography, user experience design, designing for social change, organizational information systems, ubiquitous computing, knowledge management.

Adelaida Alban Medlock, MS *(Drexel University)*. Associate Teaching Professor. Introductory programming; computer science education.

William Mongan, MS *(Drexel University) Associate Department Head for Undergraduate Affairs, Computer Science*. Associate Teaching Professor. Service-oriented architectures, program comprehension, reverse engineering, software engineering, computer architecture, computer science education, engineering education outreach

Ko Nishino, PhD *(University of Tokyo) Associate Department Head for Graduate Affairs, Computer Science*. Professor. Computer vision, computer graphics, analysis and synthesis of visual appearance.

Danuta A. Nitecki, PhD *(University of Maryland at College Park) Dean of Libraries.* Professor. Library metrics and use in management, library as place, and academic library service models.

Krzysztof Nowak, PhD *(Washington University)*. Associate Teaching Professor. Fourier analysis, partial differential equations, image processing, wavelets, asymptotic distribution of eigenvalues, numerical methods and algorithms, computer science education.

Santiago Ontañón, PhD *(University of Barcelona)*. Assistant Professor. Game AI, computer games, artificial intelligence, machine learning, case-based reasoning

Jung-ran Park, PhD *(University of Hawaii at Manoa)*. Associate Professor. Knowledge organization and representation, metadata, computer-mediated communication, cross-cultural communication, multilingual information access.

Alex Poole, PhD *(University of North Carolina)*. Assistant Professor. Digital curation, archives and records management, digital humanities, and diversity, inclusivity, and equity.

Jeffrey L. Popyack, PhD *(University of Virginia)*. Professor. Operations research, stochastic optimization, computational methods of Markov decision processes; artificial intelligence, computer science education.

Lori Richards, PhD *(University of North Carolina)*. Assistant Professor. Archives, digital curation, electronic records management, information technology and digital collections, cloud computing and record keeping, management of information organizations.

Michelle L. Rogers, PhD *(University of Wisconsin-Madison)*. Associate Professor. Human-computer interaction, healthcare informatics, human factors engineering, socio-technical systems, health services research, patient safety.

Jeffrey Salvage, MS *(Drexel University)*. Teaching Professor. Object-oriented programming, multi-agent systems, software engineering, database theory, introductory programming, data structures.

Dario Salvucci, PhD *(Carnegie Mellon University) Department Head, Computer Science*. Professor. Human computer interaction, cognitive science, machine learning, applications for driving.

Kurt Schmidt, MS *(Drexel University)*. Associate Teaching Professor. Data structures, math foundations for computer science, programming tools, programming languages.

Ali Shokoufandeh, PhD *(Rutgers University) Senior Associate Dean of Research*. Professor. Theory of algorithms, graph theory, combinational optimization, computer vision.

Erin Solovey, PhD *(Tufts University)*. Assistant Professor. Human-computer interaction, brain-computer interfaces, tangible interaction, machine learning, human interaction with complex and autonomous systems.

Il-Yeol Song, PhD *(Louisiana State University)*. Professor. Conceptual modeling, ontology and patterns, data warehouse and OLAP, object-oriented analysis and design with UML, medical and bioinformatics data modeling & integration,.

Julia Stoyanovich, PhD *(Columbia University)*. Assistant Professor. Data and knowledge management, big data, biological data management, search and ranking.

Brian Stuart, PhD *(Purdue University)*. Associate Teaching Professor. Machine learning, networking, robotics, image processing, simulation, interpreters, data storage, operating systems, computer science, data communications, distributed/operating systems, accelerated computer programming, computer graphics.

Filippos Vokolos, PhD *(Polytechnic University)*. Assistant Teaching Professor. System architecture, principles of software design and construction, verification and validation methods for the development of large software systems, foundations of software engineering, software verification & validation, software design, programming languages, dependable software systems.

Rosina Weber, PhD *(Federal University of Santa Catarina)*. Associate Professor. Case-based reasoning, explainable artificial intelligence, machine learning, textual analytics, natural language understanding, language models, recommender systems, technological aspects of knowledge management, project management, and requirements engineering.

Erija Yan, PhD *(Indiana University)*. Assistant Professor. Network Science, information analysis and retrieval, scholarly communication methods and applications.

Emeritus Faculty

Michael E. Atwood, PhD *(University of Colorado)*. Professor Emeritus. Human-computer interaction, computer-supported cooperative work, organizational memory.

Thomas A. Childers, PhD *(Rutgers University)*. Professor Emeritus. Measurement, evaluation, and planning of information and library services, the effectiveness of information organizations.

David E. Fenske, PhD *(University of Wisconsin-Madison)*. Dean Emeritus and Professor. Digital libraries, informatics, knowledge management and information technologies.

John B. Hall, PhD *(Florida State University)*. Professor Emeritus. Academic library service, library administration, organization of materials.

Katherine W. McCain, PhD *(Drexel University)*. Professor Emeritus. Scholarly communication, information production and use in the research process, development and structure of scientific specialties, diffusion of innovation, bibliometrics, evaluation of information retrieval systems.

Carol Hansen Montgomery, PhD *(Drexel University) Dean of Libraries Emeritus*. Research Professor. Selection and use of electronic collections, evaluation of library and information systems, digital libraries, economics of libraries and digital collections.

Delia Neuman, PhD *(The Ohio State University)*. Professor Emerita. Learning in information-rich environments, instructional systems design, the use of media for learning, and school library media.

Gerry Stahl, PhD *(University of Colorado)*. Professor Emeritus. Human-computer interaction, computer-supported cooperative work, computer-supported collaborative learning, theory of collaboration.

Howard D. White, PhD *(University of California at Berkeley)*. Professor Emeritus. Literature information systems, bibliometrics, research methods, collection development, online searching.

Susan Wiedenbeck, PhD *(University of Pittsburgh)*. Professor Emeritus. Human-computer interaction, end-user programming/end-user development, empirical studies of programmers, interface design and evaluation.

Minor in Computer Science

About the Minor

The computer science minor provides students with a breadth of knowledge in areas that form the foundation of computer science. The student adds some depth by selecting courses from a list of advanced computer science courses.

Program Requirements

The Computer Science minor is available to all University students in good standing, with the exception of Computer Science majors.

Prerequisites

One of the following Mathematics sequences must be completed before entering the program:

- MATH 101 and MATH 102
- MATH 121 and MATH 122

Requirements

CS 171	Computer Programming I	3.0
or CS 175	Advanced Computer Programming I	
CS 172	Computer Programming II	3.0
or CS 176	Advanced Computer Programming II	
CS 260	Data Structures	3.0
CS 265	Advanced Programming Tools and Techniques	3.0
Additional CS courses numbered 200 or higher.		12.0
Total Credits		24.0

Note: No more than 9.0 credits from a student's major may be used to fulfill the minor requirements. Students who, because of this rule, require additional credits to reach 24.0 total credits may select additional Advanced Electives as needed.

Additional Information

For more information about this program, please visit the College of Computing & Informatics' website (https://drexel.edu/cci/academics/undergraduate-programs/undergraduate-minors/).

Minor in Computing Technology

About the Minor

The demand for individuals with technology skills is increasing and essential in today's internet-dominated society. Almost every field nowadays relies on technology. People in all fields may become responsible for building or using computer networks and increasingly more complex websites and intranets. The minor in Computing Technology combines basic courses in computing technology required to help organizations build infrastructure solutions.

Any student in any major can benefit from a minor in Computing Technology. Graduates with such background knowledge are prepared to actively participate in the application of technology within the major area of study.

The minor is available to all University students in good standing, with the exception of students majoring in Computing and Security Technology.

Program Requirements

CS 171	Computer Programming I	3.0
or INFO 151	Web Systems and Services I	
CT 140	Network Administration I	3.0
CT 200	Server I	3.0
CT 201	Information Technology Security I	3.0
CT 210	Open Server I	3.0
INFO 101	Introduction to Computing and Security Technology	3.0
INFO 210	Database Management Systems	3.0
Computer Technology Elective, select 1 of the following		3.0
CT 310	Open Server II	
CT 320	Server II	
CT 330	Network Administration II	
INFO 365	Database Administration I	
Total Credits		24.0

Additional Information

For more information, please visit the College of Computing & Informatics' website (https://drexel.edu/cci/academics/undergraduate-programs/undergraduate-minors/).

Minor in Data Science

About the Minor

Data Science provides a foundation for problem-solving in a data-driven society. The minor in Data Science combines basic courses in statistics, information and technology, and social contexts to address problems that require large and disparate datasets.

Any student in any major can benefit from a minor in data science. Graduates with such background knowledge are prepared to actively participate in the application of data science within their major area of study.

The minor is available to all University students in good standing, with the exception of students majoring in data science.

CS 171	Computer Programming I	3.0
CS 172	Computer Programming II	3.0
INFO 103	Introduction to Data Science	3.0
INFO 371	Data Mining Applications	3.0
STAT 201	Introduction to Business Statistics	4.0
STAT 202	Business Statistics II	4.0
Select 2 of the following:		6.0
CS 375	Web and Mobile App Development	
CS 380	Artificial Intelligence	
CS 383	Machine Learning	
CS 461	Database Systems	
or INFO 210	Database Management Systems	
INFO 202	Data Curation	
INFO 212	Data Science Programming I	
INFO 213	Data Science Programming II	
INFO 250	Information Visualization	
INFO 323	Cloud Computing and Big Data	
INFO 332	Exploratory Data Analytics	
INFO 350	Visual Analytics	
INFO 432	Advanced Data Analytics	
INFO 440	Social Media Data Analysis	
Total Credits		26.0

Additional Information

For more information about this program, please visit the College of Computing & Informatics' website (https://drexel.edu/cci/academics/undergraduate-programs/undergraduate-minors/).

Minor in Human Computer Interaction

About the Minor

The minor in Human Computer Interaction provides a course of study for students who would like to improve the integration of computing in the lives of individuals and to use computing to enable collaboration within groups. The minor combines courses in human computer interaction, ubiquitous computing, graphical interface design, and social computing.

The minor is available to all University students in good standing, with the exception of students already majoring in information systems, computing and security technology or data science.

Program Requirements

CS 171	Computer Programming I	3.0
or INFO 151	Web Systems and Services I	
INFO 102	Introduction to Information Systems	3.0
INFO 215	Social Aspects of Information Systems	3.0
INFO 310	Human-Centered Design Process & Methods	3.0
INFO 405	Social and Collaborative Computing	3.0
HCI Electives [**]		
Select 3 of the following:		9.0
CS 338	Graphical User Interfaces	
CS 341	Serious Game Development	
CS 342	Experimental Game Development	
CS 345	Computer Game Design and Development	
CS 375	Web and Mobile App Development	
CS 380	Artificial Intelligence	
CS 467	Security and Human Behavior	
INFO 101	Introduction to Computing and Security Technology	
INFO 103	Introduction to Data Science	
INFO 110	Introduction to Human-Computer Interaction	
INFO 150	Introduction to Ubiquitous Computing	
INFO 250	Information Visualization	
INFO 350	Visual Analytics	

INFO 405	Social and Collaborative Computing	
INFO 440	Social Media Data Analysis	
Total Credits		24.0

*   CCI majors: Replace INFO 110 with an additional HCI elective.

**   HCI Elective Recommendations:
For non-CCI majors: INFO 101 INFO 103 INFO 150 INFO 250
For CS majors: CS 338 CS 341 CS 342 CS 345 CS 380 CS 375

* An additional 9.0 credits or more are to be chosen from other course offerings in HCI pertinent to the student's overall program of study. Guidance in selecting these electives will be provided by staff and faculty of the College of Computing and Informatics.

HCI Elective Recommendations:
For non-CCI majors: INFO 101, INFO 103, INFO 110, INFO 150, INFO 250
For CS majors: CS 338, CS 341, CS 342, CS 345, CS 375, CS 380

Additional Information

For more information, please visit the College of Computing & Informatics' website (https://drexel.edu/cci/academics/undergraduate-programs/undergraduate-minors/).

Minor in Information Systems

About the Minor

The information systems minor is available to all University students in good standing, with the exception of students already majoring in computing and security technology or data science.

Program Requirements

Required Courses

CT 140	Network Administration I	3.0
INFO 101	Introduction to Computing and Security Technology	3.0
INFO 102	Introduction to Information Systems	3.0
INFO 103	Introduction to Data Science	3.0
INFO 200	Systems Analysis I	3.0
INFO 210	Database Management Systems	3.0
INFO 310	Human-Centered Design Process & Methods	3.0
One information system elective *		3.0
Total Credits		24.0

*   An additional 3 credits or more are to be chosen from other course offerings in information systems pertinent to the student's overall program of study. Guidance in selecting these electives will be provided by staff and faculty of the College of Computing and Informatics.

Additional Information

For more information, please visit the College of Computing & Informatics' website (https://drexel.edu/cci/academics/undergraduate-programs/undergraduate-minors/).

Minor in Security Technology

About the Minor

The demand for individuals with security related skills is increasing and essential in today's internet-dominated society. Computer and information systems managers are becoming more involved with the security of data, responsible for sophisticated and more efficient computer networks and increasingly more complex websites and intranets. The minor in Security Technology combines basic courses in security and technology required to help organizations keep their computer systems secure.

Any student in any major can benefit from a minor in Security Technology. Graduates with such background knowledge are prepared to actively participate in the application of security technology within the major area of study.

The minor is available to all University students in good standing, with the exception of students majoring in Computing and Security Technology.

Program Requirements

CT 140	Network Administration I	3.0
CT 201	Information Technology Security I	3.0
CT 210	Open Server I	3.0
CT 301	Information Technology Security II	3.0
CT 312	Access Control and Intrusion Detection Technology	3.0
CT 412	Information Technology Security Policies	3.0
INFO 101	Introduction to Computing and Security Technology	3.0
Security Technology Elective, Select 1 of the following:		3.0
CT 315	Security Management Practice	
CT 362	Network Auditing Tools	
CT 393	Information Technology Security Risk Assessment	
CT 415	Disaster Recovery and Continuity Planning	
Total Credits		24.0

Additional Information

For more information, please visit the College of Computing & Informatics' website (https://drexel.edu/cci/academics/undergraduate-programs/undergraduate-minors/).

Minor in Software Engineering

About the Minor

The Software Engineering minor is available to all University students in good standing, with the exception of Software Engineering majors.

Prerequisites

One of the following Mathematics sequences must be completed before entering the program:

- MATH 101 and MATH 102
- MATH 121 and MATH 122

Program Requirements

CS 171	Computer Programming I	3.0
or CS 175	Advanced Computer Programming I	
CS 172	Computer Programming II	3.0
or CS 176	Advanced Computer Programming II	
CS 260	Data Structures	3.0
CS 265	Advanced Programming Tools and Techniques	3.0
SE 210	Software Specification and Design I	3.0
SE 310	Software Architecture I	3.0
or CS 350	Software Design	
SE 320	Software Verification and Validation	3.0
Select one of the following:		3.0
SE 211	Software Specification and Design II	

SE 311	Software Architecture II	
SE 410	Software Evolution	
Total Credits		24.0

Note: No more than 9.0 credits from a student's major may be used to fulfill the minor requirements. Students who, because of this rule, require additional credits to reach 24.0 total credits may select from the following courses as needed:

INFO 210	Database Management Systems	3.0
INFO 310	Human-Centered Design Process & Methods	3.0
INFO 355	Systems Analysis II	3.0
INFO 420	Software Project Management	3.0

Additional Information

For more information, please visit the College of Computing & Informatics' website (https://drexel.edu/cci/academics/undergraduate-programs/undergraduate-minors/).

The College of Engineering

The College of Engineering curriculum is designed to provide students a thorough understanding of scientific, mathematical, and engineering fundamentals--as well as the ability to apply these areas of knowledge creatively to a wide variety of engineering problems.

Majors

- Architectural Engineering (BSAE) (p. 216)
- Chemical Engineering (BSCHE) (p. 223)
- Civil Engineering (BSCIV) (p. 226)
- Computer Engineering (BSCE) (p. 231)
- Construction Management (BSCMGT) (p. 238)
  - Real Estate Concentration (p. 240)
- Electrical Engineering (BSEE) (p. 241)
- Engineering (BSE) (p. 248)
- Engineering Technology (BSET) (p. 250)
  - Computer Engineering Technology Concentration (p. 252)
  - Electrical Engineering Technology Concentration (p. 254)
  - Healthcare Engineering Technology Concentration (p. 256)
  - Industrial Engineering Technology Concentration (p. 257)
  - Mechanical Engineering Technology Concentration (http://catalog.drexel.edu/undergraduate/collegeofengineering/mechanicalengineeringtechnology/)
  - Mechanical and Manufacturing Concentration (p. 259)
- Environmental Engineering (BSENE) (p. 261)
- Materials Science and Engineering (BSMSE) (p. 265)
- Mechanical Engineering (BSME) (p. 271)

Accelerated Degree Programs

- Any Discipline BS / Project Management MS (http://catalog.drexel.edu/graduate/collegeofengineering/projectmanagement/#advanceddualdegreeoptionstext)
- Engineering Management BS/MS (http://catalog.drexel.edu/graduate/collegeofengineering/engineeringmanagementbsms/)
- Systems Engineering BS/MS (p. 277)

Minors

- Architectural Engineering (p. 280)
- Chemical Engineering (p. 280)
- Computer Engineering (p. 281)
- Construction Management (p. 281)
- Electrical Engineering (p. 282)
- Engineering Leadership (p. 282)
- Engineering Management (p. 283)
- Engineering Policy Analysis (p. 283)
- Engineering Product Development (p. 284)
- Entertainment Engineering (p. 284)
- Environmental Engineering (p. 285)
- Global Engineering (p. 285)
- Green Energy and Sustainability (p. 286)
- Materials Science and Engineering (p. 286)
- Mechanical Engineering and Mechanics (p. 286)
- Nuclear Engineering (p. 287)
- Project Management (p. 288)
- Robotics and Automation (p. 288)
- Systems Engineering (p. 288)
- Technology (p. 289)

Certificates

- Construction Management Concepts (p. 289)
- Construction Science (p. 290)
- Fundamentals of Construction Management (p. 290)
- NAE Grand Challenge Scholars Program (p. 291)

About the College

Drexel University's College of Engineering has emphasized its strengths in engineering, science and technology to train students to become the leaders of the future. In little over a century, Drexel University has transformed itself into a large, comprehensive institution committed to excellence in education, research and service to the engineering society and to the broader community. Although much has changed, the original mission of the University still rings true today.
The College of Engineering offers students a diverse academic learning and research environment embodying the highest standards of knowledge and preparing them to impact society's greatest challenges. Through entrepreneurial risk-taking and exploration, students are encouraged to find innovative solutions that promote economic development and improve life

In addition to the traditional engineering curriculum, the college offers Engineering Technology (p. 250) and Construction Management (p. 238).

Objectives of the traditional Undergraduate Engineering Program

The profession of engineering is concerned with turning the natural elements and energies to the service of mankind. The objectives of the undergraduate program in the College of Engineering (http://www.drexel.edu/coe/) are:

- *To offer an education that will give graduates the flexibility to adjust to future changes in technology*
- *To develop a sense of professionalism and entrepreneurship*
- *To provide a framework for concentrated study in a professional area*

To implement those objectives the curricula of the College of Engineering are designed to provide a firm grounding in basic science and liberal arts, along with broad-based engineering sciences and professional engineering subjects.

Cooperative Education

In five-year cooperative programs, engineering majors spend a total of 12 terms in school and six terms on co-op assignment. Freshmen attend classes for three terms. During their sophomore, pre-junior, and junior years, students generally attend class for two terms and are assigned a cooperative employment position for two terms each year.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

About the Traditional Engineering Curriculum

Degree Requirements

The degree of Bachelor of Science in the engineering specialities is comprised of academic work and six terms of co-op or engineering experience for the five-year program. For the four-year program, only two terms of co-op are required. Transfer students must complete a minimum of two terms of co-op or engineering experience in order to earn a cooperative engineering degree accredited by ABET (http://www.abet.org).

Engineering student must maintain an overall grade point average of 2.0 in all required courses in their major.

The Bachelor of Science in Engineering (BSE) program is a customizable undergraduate engineering degree program offered in the College of Engineering. The program is designed for students who are seeking an interdisciplinary education rooted in engineering. The degree is structured so students achieve a strong foundation in science, math and engineering. Upper level engineering electives can be chosen to fit the student's individual interests and career objectives. To learn more about the Bachelor of Science in Engineering program, please visit the (http://drexel.edu/engineering/areas-of-study/engineering/BSE/)Program Overview webpage (http://drexel.edu/engineering/areas-of-study/engineering/BSE/). (http://drexel.edu/engineering/areas-of-study/engineering/BSE/)

Curricular Organization

Students in the traditional engineering programs study many of the same subjects during the three terms in the first year. During the two terms of the sophomore year, students begin taking department specific coursework.

The first five terms are devoted to those subjects that form the foundation of the engineering curriculum. Courses in the core engineering curriculum are organized and taught to provide an integrated view of the basic sciences and an introduction to the art of engineering through group projects that deal with open-ended problems characteristic of the practice of engineering. Students also learn to use the modern tools of engineering both on the computer and in the laboratory.

The College considers it essential that students entering the Drexel Engineering Curriculum be placed in courses that take advantage of their abilities and prior training. Student preparation level is determined by a review committee that evaluates the student's high school record, standardized test scores, advanced placement and/or transfer credit, and placement exams administered during the summer before Fall enrollment.

Engineering students will take placement exams which will determine their readiness in calculus, physics, and chemistry. Students who demonstrate the preparation and skills to succeed in our core math and science courses, will immediately be placed into the courses starting in the fall term. Students that may need additional preparation are strongly encouraged to participate in the online prep courses the summer before the fall term.

In the second year, professional subjects are introduced, and all the first-level professional courses are completed by the junior year. The senior year in all curricula contains at least one elective sequence so that students can study some aspect of engineering more deeply. In addition, all curricula provide a design experience in the senior year. Recognizing the importance of general education studies in the education of an engineer, all curricula require that courses be taken in this area. These requirements are described in more detail in the General Education Requirements (http://drexel.edu/engineering/resources/undergraduate-advising/current-students/electives/general-ed-electives/).

The Common Curriculum

While some programs vary in detail, the following courses are common to most engineering curricula. See each program for specifics.

University Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
UNIV E101	The Drexel Experience	2.0
Foundation Requirements		
BIO 141	Essential Biology	4.5
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
ENGR 113	First-Year Engineering Design	3.0
ENGR 131	Introductory Programming for Engineers	3.0
ENGR 210	Introduction to Thermodynamics	3.0
ENGR 220	Fundamentals of Materials	4.0
ENGR 231	Linear Engineering Systems	3.0
ENGR 232	Dynamic Engineering Systems	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 200	Multivariate Calculus	4.0
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
PHYS 201	Fundamentals of Physics III	4.0

In addition, engineering students complete a minimum of 30.0 General Education Credits (p. 215).

Electives

In addition to the electives in the General Education electives there are two types of elective sequences in the engineering curricula: technical electives and free electives. Technical electives are courses in engineering, science, or management that build on the required professional courses and lead to a specific technical specialization. Possible elective sequences should be discussed with and approved by advisors before the end of the junior year. Free electives are any courses for which students are eligible and that are not remedial in nature for engineering students.

General Education Requirements

The General Education Program is designed to give engineering students an opportunity to take a set of courses that complement their technical studies and satisfy their intellectual and/or career interests. All engineering majors must take thirty (30.0) credits. Nine (9.0) of the thirty credits are designated as follows and must be completed by all majors:

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0

or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	

General Education requirements for specific majors can be found in the degree requirements for each major. The remaining credits can be chosen from the disciplines listed below.

Course Subjects

This following list is a sampling of subject codes for courses that can be taken to fulfill General Education requirements; other courses may be accepted upon advisor approval.

Accounting (ACCT), Africana Studies (AFAS), Anthropology (ANTH), Arabic (ARBC), Architecture (ARCH), Art History (ARTH), Business Law (BLAW), Chinese (CHIN), Communication (COM), Criminology & Justice Studies (CJS), Culinary Arts (CULA), Dance (DANC), Economics (ECON), Education (EDUC), English (ENGL, except ENGL 101, ENGL 102, ENGL 103 & ENGL 105), Entertainment & Arts Management (EAM), Entrepreneurship (ENTP), Environmental Studies & Sustainability (ENSS), Film Studies (FMST), Finance (FIN), French (FREN), General Business (BUSN), German (GER), Global Studies (GST), Hebrew (HBRW), History (HIST), Hotel & Restaurant Management (HRM), Humanities (HUM, except HUM 107 & HUM 108), Interior Design (INTR), International Business (INTB), Italian (ITAL), Japanese (JAPN), Judaic Studies (JUDA), Korean (KOR), Language (LANG), Leadership (LEAD), Management (MGMT), Marketing (MKTG), Military Science (MLSC), Music (MUSC), Music Industry Program (MIP), Operations Management (OPM), Operations Research (OPR), Organizational Behavior (ORGB), Philosophy (PHIL), Photography (PHTO), Product Design (PROD) Project Management (PROJ), Political Science (PSCI), Psychology (PSY, except PSY 330 & PSY 337), Public Health (PBHL), Real Estate (REAL), Screenwriting & Playwriting (SCRP), Sociology (SOC), Spanish (SPAN), Special Education (EDEX), Sports Management (SMT), STEM Teacher Education (ESTM), Taxation (TAX), Theatre (THTR), Visual Studies (VSST), WEST Studies (WEST), Women's and Gender Studies (WGST), and Writing (WRIT).

General Education electives must be non-technical. All Computer, Math, Engineering & Science related courses will NOT count as General Education electives.

Special Programs

Accelerated Programs/ Bachelor's/Master's Dual Degree Program

The Accelerated Program of the College of Engineering provides opportunities for highly talented and strongly motivated students to progress toward their educational goals essentially at their own pace. Primarily through advanced placement, credit by examination, flexibility of scheduling, and independent study, the program makes it possible to complete the undergraduate curriculum and initiate graduate study in less than the five years required by the standard curriculum. Students enrolled in this program may take advantage of the five-year Bachelor's/Master's Dual Degree Program described on the College of Engineering's Accelerated Programs (http://drexel.edu/engineering/programs/undergraduate/accelerated-programs/) web page.

Facilities

Core Engineering Facilities

The Freshman Engineering Design Laboratories are located in the newly-created Innovation Studio. The Studio hosts activities for all class levels from Freshman Design at one end through Senior Design at the other. It includes 3D printers, multiple sensor suites and the college machine shop representing the flow of freshman initial ideas through complex fabrication.

Freshman Design courses taken by all new freshmen are held exclusively in the Innovation Studio which was completed in the fall of 2015. A team of Drexel faculty and staff designed the studio to allow activities of many scales as well as to promote open communication within and across groups of students. The lab tables accommodate work in small and larger groups.

The Innovation Studios are an example of Drexel's commitment to undergraduate education, but providing up-to-date, high-quality technology to facilitate the kind of experiential learning that keeps Drexel at the cutting edge.

Department Facilities

Departments within the College of Engineering have laboratory equipment appropriate for required lab coursework within curriculum. Most engineering department webpages describe their specialized facilities in detail.

Architectural Engineering

Major: Architectural Engineering
Degree Awarded: Bachelor of Science in Architectural Engineering (BSAE)
Calendar Type: Quarter
Total Credit Hours: 189.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 14.0401
Standard Occupational Classification (SOC) code: 17-2199

About the Program

The architectural engineering major prepares graduates for professional work in the analysis, design, construction, and operation of residential, commercial, institutional, and industrial buildings. The program develops engineers familiar with all aspects of safe and economical construction. Students study the principles of structural support and external cladding, building environmental systems, and project management and develop depth in at least one area.

The program integrates building disciplines, including coordination with architects, construction managers, civil, mechanical, and electrical engineers, and others. Students use computer-aided design tools to understand system interactions, perform analysis, design, scheduling, and cost analysis, and present their work.

The first two years of the curriculum cover fundamentals necessary for all engineers. The pre-junior and junior years emphasize building systems and the principles governing their performance. In addition to the core engineering and science, students learn architectural approaches through studio design. Seniors focus on either structural or building environmental systems design, as well as a full-year realistic design project. The

academic program is complemented by exposure to professional practice in the co-op experience.

A special feature of the major is senior design. A group of students works with a faculty advisor to develop a significant design project selected by the group. All architectural engineering students participate in a design project.

Mission Statement

The civil and architectural engineering faculty are responsible for delivering an outstanding curriculum that equips our graduates with the broad technical knowledge, design proficiency, professionalism, and communications skills required for them to make substantial contributions to society and to enjoy rewarding careers.

Program Educational Objectives

Architectural engineering graduates will become responsible professionals who analyze, design, construct, manage, or operate various types of buildings and their systems, and/or advance knowledge of the field.

Student Outcomes

The department's student outcomes reflect the skills and abilities that the curriculum is designed to provide to students by the time they graduate. These are:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of the engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Concentration Options

Mechanical Concentration (HVAC)

Students who choose the mechanical concentration (HVAC) prepare for careers dealing with the building environment. As co-ops and graduates, they will be involved in the many design aspects of building environmental control, including:

- building load definitions
- equipment selection and design
- distribution system design
- control systems design

- energy analysis and system optimization
- building operation for safety, economy and maximum performance

Structural Concentration

Students who choose the structural concentration prepare for careers dealing with the building structure. As co-ops and graduates, they will be involved in the design of the many aspects of building structure including:

- building load definitions
- structural system design
- foundation system design

Digital Building Concentration

Students who choose the digital building concentration prepare for careers dealing with the role of computer technology in building design, construction and operation. As co-ops and graduates, they will be involved in:

- development and use of Building Information Models (BIM) and databases
- configuration and operation of building sensor and actuator networks and monitoring systems
- developing and maintaining construction schedules, databases and monitoring systems

Additional Information

The Architectural Engineering program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (http://www.abet.org).

For more information about this major, contact the program director:
Michael Waring, PhD
Associate Professor
Civil, Architectural & Environmental Engineering
msw59@drexel.edu

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education/Liberal Studies Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV E101	The Drexel Experience	1.0
General Education requirements [*]		12.0
Free elective		3.0
Foundation Requirements		
BIO 141	Essential Biology	4.5
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
ENGR 113	First-Year Engineering Design	3.0

ENGR 131	Introductory Programming for Engineers	3.0
or ENGR 132	Programming for Engineers	
ENGR 210	Introduction to Thermodynamics	3.0
ENGR 220	Fundamentals of Materials	4.0
ENGR 231	Linear Engineering Systems	3.0
ENGR 232	Dynamic Engineering Systems	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 200	Multivariate Calculus	4.0
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
PHYS 201	Fundamentals of Physics III	4.0
Major Requirements		
AE 220	Introduction to HVAC	3.5
AE 340	Architectural Illumination and Electrical Systems	3.0
AE 390	Architectural Engineering Design I	4.0
AE 391	Architectural Engineering Design II	4.0
AE 544	Building Envelope Systems	3.0
ARCH 141	Architecture and Society I	3.0
ARCH 142	Architecture and Society II	3.0
ARCH 143	Architecture and Society III	3.0
ARCH 191	Studio 1-AE	3.0
ARCH 192	Studio 2-AE	3.0
CAE 491 [WI]	Senior Design Project I	3.0
CAE 492 [WI]	Senior Design Project II	3.0
CAE 493 [WI]	Senior Design Project III	3.0
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
CAEE 203	System Balances and Design in CAEE	3.0
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
CAEE 361	Statistical Analysis of Engineering Systems	3.0
CIVE 240 [WI]	Engineering Economic Analysis	3.0
CIVE 250	Construction Materials	4.0
CIVE 330	Hydraulics	4.0
CIVE 320	Introduction to Fluid Flow	3.0
MEM 202	Statics	3.0
MEM 230	Mechanics of Materials I	4.0
Concentration Courses		**29.0-34.0**

Students select one of the following concentrations for a total of 29.0-34.0 credits:

Building Systems Concentration

AE 430	Control Systems for HVAC	
CIVE 302	Structural Analysis I	
CIVE 303	Structural Design I	
MEM 345	Heat Transfer	
MEM 413	HVAC Loads	
MEM 414	HVAC Equipment	
Three professional electives		

Structural Concentration

CIVE 302	Structural Analysis I	
CIVE 303	Structural Design I	
CIVE 312	Soil Mechanics I	
CIVE 315	Soil Mechanics II	
CIVE 400	First Principles of Structural Design	
CIVE 401	Structural Design II	
CIVE 402	Structural Design III	
MEM 238	Dynamics	
Two professional electives		

Digital Building Concentration

AE 510	Intelligent Buildings	
CIVE 302	Structural Analysis I	
CIVE 303	Structural Design I	

CMGT 361	Contracts And Specifications I	
CMGT 467	Techniques of Project Control	
INFO 210	Database Management Systems	
INFO 203	Information Technology for Engineers	
Three professional electives		

| Total Credits | | 189.0-194.0 |

*   General Education Requirements. (p. 215)

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

BS Architectural Engineering, Building Systems Concentration

5 YR UG Co-op Concentration/Building Systems

Term 1		Credits
CHEM 101	General Chemistry I	3.5
COOP 101	Career Management and Professional Development	0.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
MATH 121	Calculus I	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	14.5
Term 2		
CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 131 or 132	Introductory Programming for Engineers Programming for Engineers	3.0
PHYS 101	Fundamentals of Physics I	4.0
MATH 122	Calculus II	4.0
	Term Credits	16.5
Term 3		
BIO 141	Essential Biology	4.5

ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
	English Composition II	
ENGR 113	First-Year Engineering Design	3.0
MATH 200	Multivariate Calculus	4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	18.5
Term 4		
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
ENGL 103 or CIVE 240 [WI]	Composition and Rhetoric III: Themes and Genres Engineering Economic Analysis	3.0
ENGR 220	Fundamentals of Materials	4.0
ENGR 231	Linear Engineering Systems	3.0
PHYS 201	Fundamentals of Physics III	4.0
	Term Credits	17.0
Term 5		
ARCH 191	Studio 1-AE	3.0
CAEE 203	System Balances and Design in CAEE	3.0
ENGL 103 or CIVE 240 [WI]	Composition and Rhetoric III: Themes and Genres Engineering Economic Analysis	3.0
ENGR 210	Introduction to Thermodynamics	3.0
ENGR 232	Dynamic Engineering Systems	3.0
MEM 202	Statics	3.0
	Term Credits	18.0
Term 6		
AE 340	Architectural Illumination and Electrical Systems	3.0
ARCH 141	Architecture and Society I	3.0
ARCH 192	Studio 2-AE	3.0
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
CIVE 320	Introduction to Fluid Flow	3.0
	Term Credits	16.0
Term 7		
AE 220	Introduction to HVAC	3.5
ARCH 142	Architecture and Society II	3.0
CIVE 250	Construction Materials	4.0
CIVE 330	Hydraulics	4.0
MEM 230	Mechanics of Materials I	4.0
	Term Credits	18.5
Term 8		
AE 390	Architectural Engineering Design I	4.0
ARCH 143	Architecture and Society III	3.0
MEM 345	Heat Transfer	4.0
CIVE 302	Structural Analysis I	4.0
Free elective		3.0
	Term Credits	18.0
Term 9		
AE 391	Architectural Engineering Design II	4.0
CIVE 303	Structural Design I	3.0
General Education elective*		3.0
Professional elective*		3.0
	Term Credits	13.0
Term 10		
AE 544	Building Envelope Systems	3.0
CAE 491 [WI]	Senior Design Project I	3.0
CAEE 361	Statistical Analysis of Engineering Systems	3.0
MEM 413	HVAC Loads	3.0
General Education elective*		3.0
	Term Credits	15.0
Term 11		
CAE 492 [WI]	Senior Design Project II	3.0
MEM 414	HVAC Equipment	3.0
Professional elective*		3.0

General Education elective*		3.0
	Term Credits	12.0
Term 12		
AE 430	Control Systems for HVAC	3.0
CAE 493 [WI]	Senior Design Project III	3.0
Professional elective*		3.0
General Education elective*		3.0
	Term Credits	12.0

Total Credit: 189.0

*

BS Architectural Engineering, Structural
5 YR UG Co-op Concentration/Structural

Term 1		Credits
CHEM 101	General Chemistry I	3.5
COOP 101	Career Management and Professional Development	0.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
MATH 121	Calculus I	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	14.5
Term 2		
CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 131 or 132	Introductory Programming for Engineers Programming for Engineers	3.0
MATH 122	Calculus II	4.0
PHYS 101	Fundamentals of Physics I	4.0
	Term Credits	16.5
Term 3		
BIO 141	Essential Biology	4.5
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
ENGR 113	First-Year Engineering Design	3.0
MATH 200	Multivariate Calculus	4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	18.5
Term 4		
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
ENGL 103 or CIVE 240 [WI]	Composition and Rhetoric III: Themes and Genres Engineering Economic Analysis	3.0
ENGR 220	Fundamentals of Materials	4.0
ENGR 231	Linear Engineering Systems	3.0
PHYS 201	Fundamentals of Physics III	4.0
	Term Credits	17.0
Term 5		
ARCH 191	Studio 1-AE	3.0
CAEE 203	System Balances and Design in CAEE	3.0
ENGL 103 or CIVE 240 [WI]	Composition and Rhetoric III: Themes and Genres Engineering Economic Analysis	3.0
ENGR 210	Introduction to Thermodynamics	3.0
ENGR 232	Dynamic Engineering Systems	3.0
MEM 202	Statics	3.0
	Term Credits	18.0
Term 6		
AE 340	Architectural Illumination and Electrical Systems	3.0
ARCH 141	Architecture and Society I	3.0
ARCH 192	Studio 2-AE	3.0

CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
CIVE 320	Introduction to Fluid Flow	3.0
	Term Credits	16.0
Term 7		
AE 220	Introduction to HVAC	3.5
ARCH 142	Architecture and Society II	3.0
CIVE 250	Construction Materials	4.0
CIVE 330	Hydraulics	4.0
MEM 230	Mechanics of Materials I	4.0
	Term Credits	18.5
Term 8		
AE 390	Architectural Engineering Design I	4.0
ARCH 143	Architecture and Society III	3.0
CIVE 302	Structural Analysis I	4.0
CIVE 312	Soil Mechanics I	4.0
MEM 238	Dynamics	4.0
	Term Credits	19.0
Term 9		
AE 391	Architectural Engineering Design II	4.0
CIVE 303	Structural Design I	3.0
Professional elective*		3.0
General Education elective*		3.0
Free elective		3.0
	Term Credits	16.0
Term 10		
AE 544	Building Envelope Systems	3.0
CAE 491 [WI]	Senior Design Project I	3.0
CAEE 361	Statistical Analysis of Engineering Systems	3.0
CIVE 400	First Principles of Structural Design	3.0
General Education elective*		3.0
	Term Credits	15.0
Term 11		
CAE 492 [WI]	Senior Design Project II	3.0
CIVE 315	Soil Mechanics II	4.0
CIVE 401	Structural Design II	3.0
General Education elective*		3.0
	Term Credits	13.0
Term 12		
CAE 493 [WI]	Senior Design Project III	3.0
CIVE 402	Structural Design III	3.0
Professional elective*		3.0
General Education elective*		3.0
	Term Credits	12.0

Total Credit: 194.0

*   See degree requirements (p. 217).

BS Architectural Engineering, Digital Building
5 YR UG Co-op Concentration/Digital Building

Term 1		Credits
CHEM 101	General Chemistry I	3.5
COOP 101	Career Management and Professional Development	0.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
MATH 121	Calculus I	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	14.5
Term 2		
CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 131 or 132	Introductory Programming for Engineers / Programming for Engineers	3.0
PHYS 101	Fundamentals of Physics I	4.0
MATH 122	Calculus II	4.0
	Term Credits	16.5
Term 3		
BIO 141	Essential Biology	4.5
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
ENGR 113	First-Year Engineering Design	3.0
MATH 200	Multivariate Calculus	4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	18.5
Term 4		
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
ENGL 103 or CIVE 240 [WI]	Composition and Rhetoric III: Themes and Genres / Engineering Economic Analysis	3.0
ENGR 220	Fundamentals of Materials	4.0
ENGR 231	Linear Engineering Systems	3.0
PHYS 201	Fundamentals of Physics III	4.0
	Term Credits	17.0
Term 5		
ARCH 191	Studio 1-AE	3.0
CAEE 203	System Balances and Design in CAEE	3.0
ENGL 103 or CIVE 240 [WI]	Composition and Rhetoric III: Themes and Genres / Engineering Economic Analysis	3.0
ENGR 210	Introduction to Thermodynamics	3.0
ENGR 232	Dynamic Engineering Systems	3.0
MEM 202	Statics	3.0
	Term Credits	18.0
Term 6		
AE 340	Architectural Illumination and Electrical Systems	3.0
ARCH 141	Architecture and Society I	3.0
ARCH 192	Studio 2-AE	3.0
CIVE 320	Introduction to Fluid Flow	3.0
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
	Term Credits	16.0
Term 7		
AE 220	Introduction to HVAC	3.5
ARCH 142	Architecture and Society II	3.0
CIVE 250	Construction Materials	4.0
CIVE 330	Hydraulics	4.0
MEM 230	Mechanics of Materials I	4.0
	Term Credits	18.5
Term 8		
AE 390	Architectural Engineering Design I	4.0
ARCH 143	Architecture and Society III	3.0
CIVE 302	Structural Analysis I	4.0
Free elective		3.0
Professional Elective**		3.0
	Term Credits	17.0
Term 9		
AE 391	Architectural Engineering Design II	4.0
INFO 210	Database Management Systems	3.0
CIVE 303	Structural Design I	3.0
General Education Elective*		3.0
Professional Elective**		3.0
	Term Credits	16.0
Term 10		
AE 544	Building Envelope Systems	3.0

CAE 491 [WI]	Senior Design Project I	3.0
CAEE 361	Statistical Analysis of Engineering Systems	3.0
INFO 203	Information Technology for Engineers	3.0
General Education Elective[*]		3.0
	Term Credits	15.0
Term 11		
AE 510	Intelligent Buildings	3.0
CAE 492 [WI]	Senior Design Project II	3.0
CMGT 467	Techniques of Project Control	4.0
General Education Elective[*]		3.0
	Term Credits	13.0
Term 12		
CAE 493 [WI]	Senior Design Project III	3.0
CMGT 361	Contracts And Specifications I	3.0
General Education Elective[*]		3.0
Professional Elective[**]		3.0
	Term Credits	12.0

Total Credit: 192.0

[*]   See degree requirements (p. 217).

[**]   Students are asked to speak with their program advisor before registering for the INFO elective.

Co-op/Career Opportunities

The major in architectural engineering prepares students for professional work in residential, commercial, institutional, and industrial building systems, in cooperation with architects and other engineers.

Sample Co-op Experiences

When students complete their co-op jobs, they are asked to write an overview of their experiences. These brief quotes are taken from some recent student reports:

Project technician, major university: "Studied and surveyed existing buildings and facilities for: their compliance with the Americans with Disabilities Act, heating and air conditioning equipment sizing, electrical loads, and their planning and usage of space. Designed improvements from the field surveys taken, and developed construction drawings. Worked closely with the workforce in implementing these changes."

CAD technician, private engineering firm: "Prepared computer generated construction plans for various water and sewer reconstruction projects. . . .Was able to expand my knowledge of Auto CAD to include Advanced Design Modules."

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Dual/Accelerated Degree

The Accelerated Program of the College of Engineering provides opportunities for highly talented and strongly motivated students to progress toward their educational goals essentially at their own pace. Primarily through advanced placement, credit by examination, flexibility of scheduling, and independent study, the program makes it possible to complete the undergraduate curriculum and initiate graduate study in less than the five years required by the standard curriculum.

Dual Degree Bachelor's Programs

A student completing the Bachelor of Science degree program in architectural engineering may complete additional courses (specified by the department) to earn the Bachelor of Science degree in civil engineering. (The reverse is difficult because of prerequisites in the sequence of architectural studio design courses, which begins in the sophomore year.)

Bachelor's/Master's Dual Degree Program

Exceptional students can also pursue a master of science degree in the same period as the bachelor of science. Exceptional students can also pursue a master of science degree in the same period as the bachelor of science. For more information about this program, visit the Department's BS/MS Dual Degree Program (http://www.cae.drexel.edu/dual_degree.asp) page.

Facilities

The Department is well equipped with state-of-the-art facilities:

- The department computer labs are in operation: a computer-assisted design (CAD) and computerized instructional lab; and a graduate-level lab (advanced undergraduates can become involved in graduate-level work).
- External labs are used for surveying, building diagnostics, and surface and ground-water measurements.

Civil, Architectural and Environmental Engineering Faculty

Abieyuwa Aghayere, PhD *(University of Alberta)*. Professor. Structural design - concrete, steel and wood; structural failure analysis; retrofitting of existing structures; new structural systems and materials; engineering education.

Ivan Bartoli, PhD *(University of California, San Diego)*. Associate Professor. Non-destructive evaluation and structural health monitoring; dynamic identification, stress wave propagation modeling.

Robert Brehm, PhD *(Drexel University)*. Teaching Professor. International infrastructure delivery; response to natural catastrophes; risk assessment and mitigation strategies; project management techniques.

Shannon Capps, PhD *(Georgia Institute of Technology)*. Assistant Professor. Atmospheric chemistry; data assimilation; advanced sensitivity analysis; inverse modeling.

S.C. Jonathan Cheng, PhD *(West Virginia University)*. Associate Professor. Soil mechanics; geosynthetics; geotechnical engineering; probabilistic design; landfill containments; engineering education.

Eugenia Ellis, PhD, AIA *(Virginia Polytechnic Institute and State University)*. Professor. Natural and electric light sources and effects on biological rhythms and health outcomes; ecological strategies for smart, sustainable buildings of the nexus of health, energy and technology.

Yaghoob (Amir) Farnam, PhD *(Purdue University)*. Assistant Professor. Advanced and sustainable infrastructure materials; multifunctional, self-responsive and bioinspired construction materials; advanced multiscale manufacturing; characterization, and evaluation of construction materials; durability of cement-based materials.

Patricia Gallagher, PhD *(Virginia Polytechnic Institute and State University)*. Professor. Geotechnical and geoenvironmental engineering; soil improvement; soil improvement; recycled materials in geotechnics.

Patrick Gurian, PhD *(Carnegie-Mellon University)*. Professor. Risk analysis of environmental and infrastructure systems; novel adsorbent materials; environmental standard setting; Bayesian statistical modeling; community outreach and environmental health.

Charles N. Haas, PhD *(University of Illinois-Urbana) L. D. Betz Chair Professor of Environmental Engineering and Department Head, Civil, Architectural and Environmental Engineering*. Water treatment; risk assessment; bioterrorism; environmental modeling and statistics; microbiology; environmental health.

Ahmad Hamid, PhD *(McMaster University)*. Professor. Engineered masonry; seismic behavior, design and retrofit of masonry structures; development of new materials and building systems.

Simi Hoque, PhD *(University of California - Berkeley)*. Associate Professor. Computational methods to reduce building energy and environmental impacts, urban metabolism, thermal comfort, climate resilience.

Y. Grace Hsuan, PhD *(Imperial College)*. Professor. Durability of polymeric construction materials; advanced construction materials; and performance of geosynthetics.

Joseph B. Hughes, PhD *(University of Iowa)*. Distinguished University Professor. Biological processes and applications of nanotechnology in environmental systems.

L. James Lo, PhD *(University of Texas at Austin)*. Assistant Professor. Architectural fluid mechanics; building automation and autonomy; implementation of natural and hybrid ventilation in buildings; airflow distribution in buildings; large-scale air movement in an urban built environment; building and urban informatics; data-enhanced sensing and control for optimal building operation and management; novel data gathering methods for building/urban problem solving; interdisciplinary research on occupant behaviors in the built environment.

Joseph P. Martin, PhD *(Colorado State University)*. Professor. Geotechnical and geoenvironmental engineering; hydrology; transportation; waste management.

Franco Montalto, PhD *(Cornell University)*. Professor. Effects of built infrastructure on societal water needs, ecohydrologic patterns and processes, ecological restoration, green design, and water interventions.

Nariman Mostafavi, PhD *(University of Massachusetts - Amherst)*. Assistant Teaching Professor. Simulation tools for analyzing urban metabolism; environmentally responsive design; urban resilience; engineering economics; industrial ecology.

Mira S. Olson, PhD *(University of Virginia)*. Associate Professor. Peace engineering; source water quality protection and management; contaminant and bacterial fate and transport; community engagement.

Miguel A. Pando, PhD *(Virginia Polytechnic Institute and State University)*. Associate Professor. Laboratory testing of geomaterials; geotechnical aspects of natural hazards; soil-structure-interaction; geotechnical engineering.

Michael Ryan, PhD *(Drexel University) Associate Department Head of Graduate Studies*. Associate Teaching Professor. Microbial Source Tracking (MST); Quantitative Microbial Risk Assessment (QMRA); dynamic engineering systems modeling; molecular microbial biology; phylogenetics; metagenomics; bioinformatics; environmental statistics; engineering economics; microbiology; potable and waste water quality; environmental management systems.

Christopher Sales, PhD *(University of California, Berkeley)*. Associate Professor. Environmental microbiology and biotechnology; biodegradation of environmental contaminants; microbial processes for energy and resource recovery from waste; application of molecular biology, analytical chemistry and bioinformatic techniques to study environmental biological systems.

Sabrina Spatari, PhD *(University of Toronto)*. Associate Professor. Industrial ecology; development and application of life cycle assessment (LCA) and material flow analysis (MFA) methods for guiding engineering and policy decisions; specific interest in biomass and bioenergy, biofuels, and urban infrastructure.

Robert Swan Teaching Professor. Geotechnical and geosynthetic engineering; soil/geosynthetic interaction and performance; laboratory and field geotechnical/geosynthetic testing; data acquisition and instrumentation; test equipment development and test method standardization; Quality System Management (QSM) and continuous improvement.

Sharon Walker, PhD *(Yale University) Dean of the College of Engineering*. Distinguished University Professor. Water quality systems engineering.

Michael Waring, PhD *(University of Texas-Austin) Associate Department Head for Undergraduate Programs; Director of Architectural Engineering Program*. Professor. Indoor air quality and building sustainability; indoor particulate matter fate and transport; indoor chemistry and particle formation; secondary impacts of control technologies and strategies.

Jin Wen, PhD *(University of Iowa)*. Professor. Building energy efficiency; building-grid interaction; building control and operation; fault detection and diagnosis; human-building interactions; dynamic building system simulation; big data.

Aspasia Zerva, PhD *(University of Illinois - Urbana)*. Professor. Earthquake engineering; engineering seismology; structural reliability; system identification; advanced computational methods in structural analysis.

Emeritus Faculty

A. Emin Aktan, PhD *(University of Illinois at Urbana-Champaign) John Roebling Emeritus Professor of Infrastructure Studies*. Professor Emeritus. Structural engineering; health monitoring of large infrastructure systems; infrastructure evaluation; intelligent systems.

Harry G. Harris, PhD *(Cornell University)*. Professor Emeritus. Structural models; dynamics of structures, plates and shells; industrialized building construction.

James E. Mitchell, MArch *(University of Pennsylvania)*. Professor Emeritus. Architectural engineering design; building systems; engineering education.

Joseph V. Mullin, PhD *(Pennsylvania State University) Associate Department Head*. Teaching Professor. Structural engineering; failure analysis; experimental stress analysis; materials of construction; marine structures; engineering education.

Richard Weggel, PhD *(University of Illinois) Samuel S. Baxter Professor Emeritus; Civil and Environmental Engineering.* Professor Emeritus. Coastal engineering; hydraulics engineering; hydrology.

Richard Woodring, PhD *(University of Illinois) Dean of Engineering Emeritus.* Professor Emeritus. Structural engineering, reinforced concrete.

Chemical Engineering

Major: Chemical Engineering
Degree Awarded: Bachelor of Science in Chemical Engineering (BSCHE)
Calendar Type: Quarter
Total Credit Hours: 181.5
Co-op Options: Three Co-op (Five years); One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 14.0701
Standard Occupational Classification (SOC) code: 17-2041

About the Program

The department of Chemical and Biological Engineering's chemical engineering curriculum progresses through sequences in the fundamental physical sciences, humanities, engineering sciences, and engineering design.

Chemical engineers are dedicated to designing devices and processes that convert input materials into more valuable products and often to designing those products themselves. Such end products include petrochemical derivatives, fine chemicals, pharmaceuticals, plastics, and other materials, integrated circuits, electrical energy, biologically derived fuels, and much more. Chemical engineering often begins with small laboratory scale processes that must be scaled up to production levels through carefully integrated design, optimization, economic, environmental and safety analyses.

The Department of Chemical and Biological Engineering is responsible for equipping our graduates with the broad technical knowledge and teamwork skills required for them to make substantial contributions to society.

Sample Senior Design Projects

A special feature of the major is senior design. A group of students in the chemical engineering major works with a faculty advisor to develop a significant design project. Some recent examples include:

- Design of a process to make petrochemical intermediates
- Plastics recycling design
- Process design for antibiotic products

Program Educational Objectives

The Department of Chemical and Biological Engineering has four goals pertaining to student outcomes within a few years of graduation:

- Our graduates will succeed in careers requiring strong skills in engineering, science, creative problem solving, communication, teamwork, and appropriate leadership.
- Our graduates will continue their professional development through life-long learning involving self- or group-study and on-the-job training.
- Our graduates will hold paramount the safety, health, and welfare of the public. They will conduct their work ethically and understand its global impact and sustainability.

- Our graduates will be thought leaders in their area of expertise who are prepared to contribute to research, development, and industrial innovation at the forefront of chemical engineering and related fields.

Additional Information

The Chemical Engineering program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (http://www.abet.org).

For more information about this program, visit Drexel University's Department of Chemical and Biological Engineering (https://drexel.edu/engineering/academics/departments/chemical-biological-engineering/) web page.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education/Liberal Studies Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV E101	The Drexel Experience	1.0
General Education Requirements [*]		19.0
Foundation Requirements		
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
ENGR 220	Fundamentals of Materials	4.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
ENGR 113	First-Year Engineering Design	3.0
ENGR 131	Introductory Programming for Engineers	3.0
or ENGR 132	Programming for Engineers	
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 200	Multivariate Calculus	4.0
MATH 201	Linear Algebra	4.0
MATH 210	Differential Equations	4.0
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
Bio Elective		3.0
Professional Requirements		
CHE 211	Material and Energy Balances I	4.0
CHE 212	Material and Energy Balances II	4.0
CHE 220	Computational Methods in Chemical Engineering I	3.0
CHE 230	Chemical Engineering Thermodynamics I	4.0
CHE 320	Computational Methods in Chemical Engineering II	3.0
CHE 330	Chemical Engineering Thermodynamics II	4.0
CHE 331	Separation Processes	3.0
CHE 341	Fluid Mechanics	4.0
CHE 342	Heat Transfer	4.0
CHE 343	Mass Transfer	4.0
CHE 350	Statistics and Design of Experiments	3.0
CHE 351	Chemical Engineering Laboratory I	2.5
CHE 352	Chemical Engineering Laboratory II	2.5
CHE 362	Chemical Kinetics and Reactor Design	4.0

CHE 371	Engineering Economics and Professional Practice	3.0
CHE 372	Integrated Case Studies in Chemical Engineering	3.0
CHE 453	Chemical Engineering Laboratory III	2.5
CHE 464	Process Dynamics and Control	3.0
CHE 466	Chemical Process Safety	3.0
CHE 471	Process Design I	4.0
CHE 472	Process Design II	3.0
CHE 473	Process Design III	3.0
CHEC 353	Physical Chemistry and Applications III	4.0
CHEM 241	Organic Chemistry I	4.0
CHEM 242	Organic Chemistry II	4.0
CHEM 356	Physical Chemistry Laboratory	2.0
Technical Electives		12.0
Total Credits		181.5

*   General Education Requirements (p. 215).

Graduate-Level Electives

CHE 502	Mathematical Methods in Chemical Engineering	3.0
CHE 513	Chemical Engineering Thermodynamics I	3.0
CHE 525	Transport Phenomena I	3.0
CHE 543	Kinetics & Catalysis I	3.0
CHE 554	Process Systems Engineering	3.0
CHE 562	Bioreactor Engineering	3.0
CHE 564	Unit Operations in Bioprocess Systems	3.0
CHE 614	Chemical Engineering Thermodynamics II	3.0

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

5 YR UG Co-op Concentration

Term 1		Credits
CHEM 101	General Chemistry I	3.5
COOP 101	Career Management and Professional Development	0.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
MATH 121	Calculus I	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	14.5
Term 2		
CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 131 or 132	Introductory Programming for Engineers Programming for Engineers	3.0
MATH 122	Calculus II	4.0
PHYS 101	Fundamentals of Physics I	4.0
	Term Credits	16.5
Term 3		
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
ENGR 113	First-Year Engineering Design	3.0
MATH 200	Multivariate Calculus	4.0
PHYS 102	Fundamentals of Physics II	4.0
General Education Elective		3.0
	Term Credits	17.0
Term 4		

CHE 211	Material and Energy Balances I	4.0
CHE 220	Computational Methods in Chemical Engineering I	3.0
CHEM 241	Organic Chemistry I	4.0
MATH 201	Linear Algebra	4.0
	Term Credits	15.0
Term 5		
CHE 212	Material and Energy Balances II	4.0
CHE 230	Chemical Engineering Thermodynamics I	4.0
CHEM 242	Organic Chemistry II	4.0
MATH 210	Differential Equations	4.0
	Term Credits	16.0
Term 6		
CHE 330	Chemical Engineering Thermodynamics II	4.0
CHE 341	Fluid Mechanics	4.0
CHE 350	Statistics and Design of Experiments	3.0
ENGR 220	Fundamentals of Materials	4.0
	Term Credits	15.0
Term 7		
CHE 320	Computational Methods in Chemical Engineering II	3.0
CHE 342	Heat Transfer	4.0
CHE 343	Mass Transfer	4.0
CHE 351	Chemical Engineering Laboratory I	2.5
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
	Term Credits	16.5
Term 8		
CHE 331	Separation Processes	3.0
CHE 362	Chemical Kinetics and Reactor Design	4.0
CHEC 353	Physical Chemistry and Applications III	4.0
CHEM 356	Physical Chemistry Laboratory	2.0
Bio Elective[**]		3.0
	Term Credits	16.0
Term 9		
CHE 352	Chemical Engineering Laboratory II	2.5
CHE 371	Engineering Economics and Professional Practice	3.0
CHE 372	Integrated Case Studies in Chemical Engineering	3.0
CHE Technical Elective		3.0
General Education Elective[*]		3.0
	Term Credits	14.5
Term 10		
CHE 453	Chemical Engineering Laboratory III	2.5
CHE 464	Process Dynamics and Control	3.0
CHE 471	Process Design I	4.0
CHE Technical Elective		3.0
General Education Elective[*]		3.0
	Term Credits	15.5
Term 11		
CHE 472	Process Design II	3.0
General Education Elective[*]		7.0
CHE Technical Elective		3.0
	Term Credits	13.0
Term 12		
CHE 466	Chemical Process Safety	3.0
CHE 473	Process Design III	3.0
CHE Technical Elective		3.0
General Education Elective[*]		3.0
	Term Credits	12.0

Total Credit: 181.5

*   See degree requirements (p. 223).

**   Pick from BIO 100, BIO 101, BIO 122, or BIO 141

Co-op/Career Opportunities

Chemical engineers tend to work for large corporations with such job assignments as process engineering, design engineering, plant operation, research and development, sales, and management. They also work for federal and state government agencies on projects related to environmental problems, defense, energy, and health-related research.

Some major employers of Drexel's chemical engineering graduates are DuPont, Merck, BASF, ExxonMobil, Dow Chemical, and Air Products. A number of graduates go on to pursue master's and/or doctoral degrees. Graduate schools that Drexel's chemical engineers have attended include the University of California at Berkeley and Massachusetts Institute of Technology, among others.

Co-op Experiences

Drexel is located in downtown Philadelphia with easy access to major pharmaceutical, chemical, and petroleum companies. When students complete their co-op jobs, they are asked to write an overview of their experiences. These brief quotes are taken from some recent student reports:

Research assistant, chemicals manufacturer: "Conducted research in a developmental polyamide process. Aspects included scale-up from bench-scale to batch demonstration, installation and calibration of on-line composition sensors, off-line analytical techniques to assess product quality, and interfacing with plant sites to define and standardize a critical quality lab procedure. Documented results in technical memos and in a plant presentation . . .I had a lot of freedom and responsibility. It was great interacting with other researchers and technicians. Everyone was so helpful. "

Co-op engineer, chemicals manufacturer: "Created material safety data sheets, which involved chemical composition, hazard communication, occupational safety and health, emergency response, and regulatory issues for numerous products and wastes. Handled domestic and international regulatory reviews. Determined hazardous waste reporting requirements, handling and disposal procedures. Evaluated toxicological and ecological data for assessment of hazard ratings. Provided input on product safety technical reports."

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Facilities

The Department of Chemical and Biological Engineering occupies the 2nd, 3rd, and 4th floors of the Center for Automation Technology. Approximately 35,000 square feet (gross) are available for the department.

Two thousand square feet of laboratory facilities are designed for the pre-junior and junior year laboratory courses. Experiments in these laboratory courses focus on applying concepts in thermodynamics, fluid mechanics, heat and mass transfer, separations, and reaction engineering. Laboratory courses are run with class sizes of 18 students or less.

The department has two computer laboratories:

- The senior design laboratory features nine booths designed for team projects. Each booth contains a work station loaded with the latest process simulation software produced by Aspen, Simulation Sciences and HYSIS. Seniors use the room heavily during their Capstone design experience, although pre-junior courses in separations and transport also include projects requiring use of the process simulation software.
- A second computer lab contains over 30 individual work stations with general and engineering-specific software.

Many undergraduate students participate in research projects in faculty laboratories as part of independent study coursework or BS/MS thesis work. Chemical engineering faculty are engaged in a wide range of research activities in areas including energy and the environment, polymer science and engineering, biological engineering, and multi-scale modeling and process systems engineering. Further details can be found on the Department of Chemical and Biological Engineering's Research Group (https://drexel.edu/engineering/academics/departments/chemical-biological-engineering/department-research/research-groups/) web page.

Dual/Accelerated Degree

Accelerated Program

The accelerated program of the College of Engineering provides opportunities for highly-talented and strongly-motivated students to progress toward their educational goals essentially at their own pace. Through advanced placement, credit by examination, flexibility of scheduling, and independent study, the program makes it possible to complete the undergraduate curriculum and initiate graduate study in less than the five years required by the standard curriculum.

Bachelor's/Master's Dual Degree Program

Drexel offers a combined BS/MS degree program for our top engineering students who want to obtain both degrees in the same time period as most students obtain a Bachelor's degree. In chemical engineering, the course sequence for BS/MS students involves additional graduate courses and electives.

Chemical Engineering Faculty

Cameron F. Abrams, PhD *(University of California, Berkeley)*. Professor. Molecular simulations in biophysics and materials; receptors for insulin and growth factors; and HIV-1 envelope structure and function.

Nicolas Alvarez, PhD *(Carnegie Mellon University)*. Assistant Professor. Phototonic crystal defect chromatography; extensional rheology of polymer/polymer composites; surfactant/polymer transport to fluid and solid interfaces; aqueous lubrication; interfacial instabilities.

Jason Baxter, PhD *(University of California, Santa Barbara)*. Professor. Solar cells, semiconductor nanomaterials, ultrafast spectroscopy.

Richard A. Cairncross, PhD *(University of Minnesota)*. Associate Professor. Effects of microstructure on transport and properties of polymers; moisture transport and degradation on biodegradation on biodegradable polymers; production of biofuel.

Aaron Fafarman, PhD *(Stanford University)*. Associate Professor. Photovoltaic energy conversion; solution-based synthesis of semiconductor thin films; colloidal nanocrystals; electromodulation and photomodulation spectroscopy.

Vibha Kalra, PhD *(Cornell University)*. Associate Professor. Electrodes for energy storage and conversion; supercapacitors; Li-S batteries; fuel cells; flow batteries; electrospinning for nanofibers; molecular dynamics simulations; Nanotechnology, polymer nanocomposites.

Kenneth K.S. Lau, PhD *(Massachusetts Institute of Technology) Associate Department Head*. Professor. Surface science; nanotechnology; polymer thin films and coatings; chemical vapor deposition.

Raj Mutharasan, PhD *(Drexel University) Frank A, Fletcher Professor*. Biochemical engineering; cellular metabolism in bioreactors; biosensors.

Giuseppe R. Palmese, PhD *(University of Delaware)*. George B Francis Professor. Reacting polymer systems; nanostructured polymers; radiation processing of materials; composites and interfaces.

Joshua Snyder, PhD *(Johns Hopkins University)*. Assistant Professor. Electrocatalysis (energy conversion/storage); hetergeneous catalysis corrosion (dealloying nanoporous metals); interfacial electrochemical phenomena in nanostructured materials; colloidal synthesis.

Masoud Soroush, PhD *(University of Michigan)*. Professor. Process systems engineering; polymer engineering.

John H. Speidel, BSHE, MCHE *(University of Delaware; Illinois Institute of Technology)*. Teaching Professor. Chemical process safety; process design engineering.

Maureen Tang, PhD *(University of California, Berkeley)*. Assistant Professor. Batteries and fuel cells; nonaqueous electrochemistry; charge transport at interfaces.

Michael Walters, PhD *(Drexel University)*. Assistant Teaching Professor. Undergraduate laboratory.

Stephen P. Wrenn, PhD *(University of Delaware)*. Professor. Biomedical engineering; biological colloids; membrane phase behavior and cholesterol transport.

Emeritus Faculty

Charles B. Weinberger, PhD *(University of Michigan)*. Professor Emeritus. Suspension rheology; fluid mechanics of multi-phase systems.

Civil Engineering

Major: Civil Engineering
Degree Awarded: Bachelor of Science in Civil Engineering (BSCIV)
Calendar Type: Quarter
Total Credit Hours: 188.5
Co-op Options: Three Co-op (Five years); One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 14.0801
Standard Occupational Classification (SOC) code: 17-2051

About the Program

The civil engineering major prepares students in the fundamental principles necessary to practice this profession in any of its branches, including construction management, water resources, structural, transportation, environmental, geotechnical, and public facilities engineering.

Civil engineers are active in the planning, design, construction, research and development, operation, maintenance, and rehabilitation of large engineering systems. A particular focus is the reconstruction of the nation's infrastructure through solutions that minimize the disruption of social and natural environments.

Civil engineering graduates are grounded in the fundamental principles necessary for the practice of this profession in any of its modern branches, including construction management, water resources engineering, structural engineering, geotechnical engineering, transportation engineering, and environmental engineering.

Seven of the required courses in the discipline include integral laboratories or field projects for both educational illustration and professional practice exposure.

Careful selection of the electives specified in the curriculum can lead to a wide variety of career objectives. For instance, students with an interest in water resources engineering may elect advanced courses in hydrology, ecology, and chemistry; select senior professional electives in the geotechnical and water resources areas; and choose appropriate topics for senior design and senior seminar. Seniors, with the approval of the department head, can elect certain graduate courses.

A special feature of the major is senior design. A group of students works with a faculty advisor to develop a significant design project selected by the group. All civil engineering students participate in a design project.

Mission Statement

The civil and architectural engineering faculty are responsible for delivering an outstanding curriculum that equips our graduates with the broad technical knowledge, design proficiency, professionalism, and communications skills required for them to make substantial contributions to society and to enjoy rewarding careers.

Program Educational Objectives

Civil engineering graduates will become responsible professionals who analyze, design, construct, manage or operate built and natural infrastructure and systems, and/or advance knowledge of the field.

Student Outcomes

The department's student outcomes reflect the skills and abilities that the curriculum is designed to provide to students by the time they graduate. These are:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of the engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Additional Information

The Civil Engineering program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (http://www.abet.org).

For more information about this major, contact the Department of Civil, Architectural and Environmental Engineering. (https://drexel.edu/engineering/academics/areas-of-study-programs/cvil-engineering/)

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education/Liberal Studies Requirements

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV E101	The Drexel Experience	1.0
General Education Requirements [*]		21.0
Free Electives		6.0
Foundation Requirements		
BIO 141	Essential Biology	4.5
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
ENGR 210	Introduction to Thermodynamics	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
ENGR 113	First-Year Engineering Design	3.0
ENGR 131	Introductory Programming for Engineers	3.0
or ENGR 132	Programming for Engineers	
ENGR 220	Fundamentals of Materials	4.0
ENGR 231	Linear Engineering Systems	3.0
ENGR 232	Dynamic Engineering Systems	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 200	Multivariate Calculus	4.0
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
PHYS 201	Fundamentals of Physics III	4.0
Major Requirements		
CAE 491 [WI]	Senior Design Project I	3.0
CAE 492 [WI]	Senior Design Project II	3.0
CAE 493 [WI]	Senior Design Project III	3.0
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
CAEE 203	System Balances and Design in CAEE	3.0
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
CAEE 361	Statistical Analysis of Engineering Systems	3.0
CIVE 240 [WI]	Engineering Economic Analysis	3.0
CIVE 250	Construction Materials	4.0
CIVE 302	Structural Analysis I	4.0
CIVE 303	Structural Design I	3.0
CIVE 312	Soil Mechanics I	4.0
CIVE 315	Soil Mechanics II	4.0
CIVE 320	Introduction to Fluid Flow	3.0
CIVE 330	Hydraulics	4.0

CIVE 375	Structural Material Behavior	3.0
CIVE 430	Hydrology	3.0
CIVE 477 [WI]	Seminar	2.0
CIVE 478 [WI]	Seminar	1.0
ENVE 300	Introduction to Environmental Engineering	3.0
MEM 202	Statics	3.0
MEM 238	Dynamics	4.0
MEM 230	Mechanics of Materials I	4.0
Senior Professional Electives [**]		18.0
Total Credits		188.5

[*] General Education Requirements (p. 215).

[**] A sequence of three courses in a major area of study is required, with a total of six 3-credit professional electives.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

BS Civil Engineering

5 YR UG Co-op Concentration

Term 1		Credits
CHEM 101	General Chemistry I	3.5
COOP 101	Career Management and Professional Development	0.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
MATH 121	Calculus I	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	14.5
Term 2		
CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 131 or 132	Introductory Programming for Engineers / Programming for Engineers	3.0

MATH 122	Calculus II	4.0
PHYS 101	Fundamentals of Physics I	4.0
	Term Credits	16.5
Term 3		
BIO 141	Essential Biology	4.5
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
ENGR 113	First-Year Engineering Design	3.0
MATH 200	Multivariate Calculus	4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	18.5
Term 4		
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
ENGR 220	Fundamentals of Materials	4.0
ENGL 103 or CIVE 240 [WI]	Composition and Rhetoric III: Themes and Genres Engineering Economic Analysis	3.0
ENGR 231	Linear Engineering Systems	3.0
PHYS 201	Fundamentals of Physics III	4.0
	Term Credits	17.0
Term 5		
CAEE 203	System Balances and Design in CAEE	3.0
ENGR 210	Introduction to Thermodynamics	3.0
ENGL 103 or CIVE 240 [WI]	Composition and Rhetoric III: Themes and Genres Engineering Economic Analysis	3.0
ENGR 232	Dynamic Engineering Systems	3.0
MEM 202	Statics	3.0
	Term Credits	15.0
Term 6		
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
CIVE 320	Introduction to Fluid Flow	3.0
ENVE 300	Introduction to Environmental Engineering	3.0
MEM 230	Mechanics of Materials I	4.0
General Education Elective[*]		3.0
	Term Credits	17.0
Term 7		
CIVE 250	Construction Materials	4.0
CIVE 330	Hydraulics	4.0
MEM 238	Dynamics	4.0
Free elective		3.0
General Education Elective[*]		3.0
	Term Credits	18.0
Term 8		
CAEE 361	Statistical Analysis of Engineering Systems	3.0
CIVE 302	Structural Analysis I	4.0
CIVE 312	Soil Mechanics I	4.0
CIVE 430	Hydrology	3.0
General Education Elective[*]		3.0
	Term Credits	17.0
Term 9		
CIVE 303	Structural Design I	3.0
CIVE 315	Soil Mechanics II	4.0
CIVE 375	Structural Material Behavior	3.0
General Education Electives[*]		3.0
	Term Credits	13.0
Term 10		
CAE 491 [WI]	Senior Design Project I	3.0
CIVE 477 [WI]	Seminar	2.0
Professional Electives[*]		6.0
General Education Elective[*]		3.0
	Term Credits	14.0
Term 11		

CAE 492 [WI]	Senior Design Project II	3.0
CIVE 478 [WI]	Seminar	1.0
Professional Electives[*]		6.0
General Education Elective[*]		3.0
	Term Credits	13.0
Term 12		
CAE 493 [WI]	Senior Design Project III	3.0
Free Elective		3.0
Professional Electives[*]		6.0
General Education Elective[*]		3.0
	Term Credits	15.0

Total Credit: 188.5

[*]   See degree requirements (p. 227).

Co-op/Career Opportunities

When students complete their co-op jobs, they are asked to write an overview of their experiences. These brief quotes are taken from some recent student reports:

Engineering construction inspector, state department of transportation: Supervised daily activities involved in the roadway construction of the [interstate] bypass. Recorded daily visual inspection reports for soil sub-base and materials placed on site. Aided senior roadway engineers in approving grade prior to asphalt placement. Used various instruments to check temperature and depths for asphalt placement. Took part in on-site discussions with contractor to clear up any daily construction problems that would hinder quality of construction. "

Construction inspector, municipal department of public property: "Inspected work performed by private contractors on city public works construction and rehabilitation projects for adherence to contract plans and specifications. Projects included health centers, police and fire stations, libraries, city hall, transit concourses, and prisons. Responsible for daily inspection reports and overall coordination for each respective project. Also responsible for reviewing bills and writing contract modifications and amendments. . .the variety of work was excellent. "

Environmental co-op, chemicals manufacturer: "Compiled data and wrote monthly regulatory reports, in charge of hazardous waste management and small projects as needed. . . . I had my own responsibilities that had an impact on the entire company. Employer was really interested in my opinion and gave me a chance to demonstrate my abilities, but also knew when to step in. Everybody was willing to answer any questions I may have had."

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Dual/Accelerated Degree
Accelerated program

The Accelerated Program of the College of Engineering provides opportunities for highly talented and strongly motivated students to progress toward their educational goals essentially at their own pace. Primarily through advanced placement, credit by examination, flexibility of scheduling, and independent study, the program makes it possible to complete the undergraduate curriculum and initiate graduate study in less than the five years required by the standard curriculum.

Dual Degree Bachelor's Programs

A student completing the Bachelor of Science degree program in architectural engineering may complete additional courses (specified by the department) to earn the Bachelor of Science degree in civil engineering. (The reverse is difficult because of prerequisites in the sequence of architectural studio design courses, which begins in the sophomore year.)

Civil Engineering students can also complete a dual degree with the Bachelor of Science in Environmental Engineering.

Bachelor's/Master's Dual Degree Program

Exceptional students can also pursue a master of science degree in the same period as the bachelor of science.

For more information about this program, visit the Department's BS/MS Dual Degree Program (https://drexel.edu/engineering/academics/departments/civil-architectural-environmental-engineering/academic-programs/undergraduate/accelerated-and-dual-degree-programs/) web page.

Facilities

The Civil, Architectural, and Environmental Engineering Department laboratories provide students with fully equipped space for education and research opportunities.

Structural and Geotechnical Research Laboratory Facilities and Equipment

The geotechnical and structural engineering research labs at Drexel University provide a forum to perform large-scale experimentation across a broad range of areas including infrastructure preservation and renewal, structural health monitoring, geosynthetics, nondestructive evaluation, earthquake engineering, and novel ground modification approaches among others.

The laboratory is equipped with different data acquisition systems (MTS, Campbell Scientific, and National Instruments) capable of recording strain, displacement, tilt, load and acceleration time histories. An array of sensors including LVDTs, wire potentiometers, linear and rotational accelerometers, and load cells are also available. Structural testing capabilities include two 220kips capacity loading frames (MTS 311 and Tinius Olsen), in addition to several medium capacity testing frames (Instron 1331 and 567 and MTS 370 testing frames), two 5-kips MTS actuators for dynamic testing and one degree of freedom 22kips ANCO shake table. The laboratory also features a phenomenological physical model which resembles the dynamic features of common highway bridges and is used for field testing preparation and for testing different measurement devices.

The **Woodring Laboratory** hosts a wide variety of geotechnical, geosynthetics, and materials engineering testing equipment. The geotechnical engineering testing equipment includes Geotac unconfined compression and a triaxial compression testing device, ring shear apparatus, constant rate of strain consolidometer, an automated incremental consolidometer, an automated Geotac direct shear device and a large-scale consolidometer (12" by 12" sample size). Other equipment includes a Fisher pH and conductivity meter as well as a Brookfield rotating viscometer. Electronic and digital equipment include FLIR SC 325 infrared camera for thermal measurements, NI Function generators, acoustic emission sensors and ultrasonic transducers, signal conditioners, and impulse hammers for nondestructive testing.

The geosynthetics testing equipment in the Woodring lab includes pressure cells for incubation and a new differential scanning calorimetry device including the standard-OIT. Materials testing equipment that is available through the materials and chemical engineering departments includes a scanning electron microscope, liquid chromatography, and Fourier transform infrared spectroscopy.

The Building Science and Engineering Group (BSEG) research space is also located in the Woodring Laboratory. This is a collaborative research unit working at Drexel University with the objective of achieving more comprehensive and innovative approaches to sustainable building design and operation through the promotion of greater collaboration between diverse sets of research expertise. Much of the BSEG work is simulation or model based. Researchers in this lab also share some instrumentation with the DARRL lab (see below).

Environmental Engineering Laboratory Facilities and Equipment

The environmental engineering laboratories at Drexel University allow faculty and student researchers access to state-of-the-art equipment needed to execute a variety of experiments. These facilities are located in the Alumni Engineering Laboratory Building and includes approximately 2000 SF shared laboratory space, and a 400 SF clean room for cell culture and PCR.

The major equipment used in this laboratory space consists of: Roche Applied Science LightCyclerÔ 480 Real-time PCR System, Leica fluorescence microscope with phase contrast and video camera, Spectrophotometer, Zeiss stereo microscope with heavy duty boom stand, fluorescence capability, and a SPOT cooled color camera, BIORAD iCycler thermocycler for PCR, gel readers, transilluminator and electrophoresis setups, temperature controlled circulator with immersion stirrers suitable for inactivation studies at volumes up to 2 L per reactor, BSL level 2 fume hood, laminar hood, soil sampling equipment, Percival Scientific environmental chamber (model 1-35LLVL), custom-built rainfall simulator.

The **Drexel Air Resources Research Laboratory (DARRL)** is located in the Alumni Engineering Laboratory Building and contains state-of-the-art aerosol measurement instrumentation including a Soot Particle Aerosol Mass Spectrometer (Aerodyne Research Inc.), mini-Aerosol Mass Spectrometer, (Aerodyne Research Inc.), Scanning Electrical Mobility Sizer (Brechtel Manufacturing), Scanning Mobility Particle Sizer (TSI Inc.), Fast Mobility Particle Sizer (TSI Inc.), Centrifugal Particle Mass Analyzer (Cambustion Ltd.), GC-FID, ozone monitors, and other instrumentation. These instruments are used for the detailed characterization of the properties of particles less than 1 micrometer in diameter including: chemical composition, size, density, and shape or morphology.

In addition to the analytical instrumentation in DARRL, the laboratory houses several reaction chambers. These chambers are used for controlled experiments meant to simulate chemical reactions that occur in the indoor and outdoor environments. The reaction chambers vary in size from 15 L to 1 m3, and allow for a range of experimental conditions to be conducted in the laboratory.

Computer Equipment and Software

The Civil, Architectural, and Environmental Engineering (CAEE) Department at Drexel University has hardware and software capabilities

for students to conduct research. The CAEE department operates a computer lab that is divided into two sections; one open access room, and a section dedicated to teaching. The current computer lab has 25 desktop computers that are recently updated to handle resource intensive GIS (Geographic Information Systems) and image processing software. There are a sufficient number of B&W and color laser printers that can be utilized for basic printing purposes.

Drexel University has site-licenses for a number of software, such as ESRITM ArcGIS 10, Visual Studio, SAP 2000, STAAD, Abaqus and MathworksTM Matlab. The Information Resources & Technology (IRT) department at Drexel University provides support (e.g., installation, maintenance and troubleshooting) to the above-mentioned software. It is currently supporting the lab by hosting a software image configuration that provides a series of commonly used software packages, such as MS Office and ADOBE Acrobat among others. As a part of ESRI campus license (the primary maker of GIS applications, i.e. ArcGIS) the department has access to a suite of seated licenses for GIS software with necessary extensions (e.g., LIDAR Analyst) required for conducting research.

Civil, Architectural and Environmental Engineering Faculty

Abieyuwa Aghayere, PhD *(University of Alberta)*. Professor. Structural design - concrete, steel and wood; structural failure analysis; retrofitting of existing structures; new structural systems and materials; engineering education.

Ivan Bartoli, PhD *(University of California, San Diego)*. Associate Professor. Non-destructive evaluation and structural health monitoring; dynamic identification, stress wave propagation modeling.

Robert Brehm, PhD *(Drexel University)*. Teaching Professor. International infrastructure delivery; response to natural catastrophes; risk assessment and mitigation strategies; project management techniques.

Shannon Capps, PhD *(Georgia Institute of Technology)*. Assistant Professor. Atmospheric chemistry; data assimilation; advanced sensitivity analysis; inverse modeling.

S.C. Jonathan Cheng, PhD *(West Virginia University)*. Associate Professor. Soil mechanics; geosynthetics; geotechnical engineering; probabilistic design; landfill containments; engineering education.

Eugenia Ellis, PhD, AIA *(Virginia Polytechnic Institute and State University)*. Professor. Natural and electric light sources and effects on biological rhythms and health outcomes; ecological strategies for smart, sustainable buildings of the nexus of health, energy and technology.

Yaghoob (Amir) Farnam, PhD *(Purdue University)*. Assistant Professor. Advanced and sustainable infrastructure materials; multifunctional, self-responsive and bioinspired construction materials; advanced multiscale manufacturing; characterization, and evaluation of construction materials; durability of cement-based materials.

Patricia Gallagher, PhD *(Virginia Polytechnic Institute and State University)*. Professor. Geotechnical and geoenvironmental engineering; soil improvement; soil improvement; recycled materials in geotechnics.

Patrick Gurian, PhD *(Carnegie-Mellon University)*. Professor. Risk analysis of environmental and infrastructure systems; novel adsorbent materials; environmental standard setting; Bayesian statistical modeling; community outreach and environmental health.

Charles N. Haas, PhD *(University of Illinois-Urbana) L. D. Betz Chair Professor of Environmental Engineering and Department Head, Civil, Architectural and Environmental Engineering*. Water treatment; risk assessment; bioterrorism; environmental modeling and statistics; microbiology; environmental health.

Ahmad Hamid, PhD *(McMaster University)*. Professor. Engineered masonry; seismic behavior, design and retrofit of masonry structures; development of new materials and building systems.

Simi Hoque, PhD *(University of California - Berkeley)*. Associate Professor. Computational methods to reduce building energy and environmental impacts, urban metabolism, thermal comfort, climate resilience.

Y. Grace Hsuan, PhD *(Imperial College)*. Professor. Durability of polymeric construction materials; advanced construction materials; and performance of geosynthetics.

Joseph B. Hughes, PhD *(University of Iowa)*. Distinguished University Professor. Biological processes and applications of nanotechnology in environmental systems.

L. James Lo, PhD *(University of Texas at Austin)*. Assistant Professor. Architectural fluid mechanics; building automation and autonomy; implementation of natural and hybrid ventilation in buildings; airflow distribution in buildings; large-scale air movement in an urban built environment; building and urban informatics; data-enhanced sensing and control for optimal building operation and management; novel data gathering methods for building/urban problem solving; interdisciplinary research on occupant behaviors in the built environment.

Joseph P. Martin, PhD *(Colorado State University)*. Professor. Geotechnical and geoenvironmental engineering; hydrology; transportation; waste management.

Franco Montalto, PhD *(Cornell University)*. Professor. Effects of built infrastructure on societal water needs, ecohydrologic patterns and processes, ecological restoration, green design, and water interventions.

Nariman Mostafavi, PhD *(University of Massachusetts - Amherst)*. Assistant Teaching Professor. Simulation tools for analyzing urban metabolism; environmentally responsive design; urban resilience; engineering economics; industrial ecology.

Mira S. Olson, PhD *(University of Virginia)*. Associate Professor. Peace engineering; source water quality protection and management; contaminant and bacterial fate and transport; community engagement.

Miguel A. Pando, PhD *(Virginia Polytechnic Institute and State University)*. Associate Professor. Laboratory testing of geomaterials; geotechnical aspects of natural hazards; soil-structure-interaction; geotechnical engineering.

Michael Ryan, PhD *(Drexel University) Associate Department Head of Graduate Studies*. Associate Teaching Professor. Microbial Source Tracking (MST); Quantitative Microbial Risk Assessment (QMRA); dynamic engineering systems modeling; molecular microbial biology; phylogenetics; metagenomics; bioinformatics; environmental statistics; engineering economics; microbiology; potable and waste water quality; environmental management systems.

Christopher Sales, PhD *(University of California, Berkeley)*. Associate Professor. Environmental microbiology and biotechnology; biodegradation of environmental contaminants; microbial processes for energy and resource recovery from waste; application of molecular biology, analytical chemistry and bioinformatic techniques to study environmental biological systems.

Sabrina Spatari, PhD *(University of Toronto)*. Associate Professor. Industrial ecology; development and application of life cycle assessment (LCA) and material flow analysis (MFA) methods for guiding engineering and policy decisions; specific interest in biomass and bioenergy, biofuels, and urban infrastructure.

Robert Swan Teaching Professor. Geotechnical and geosynthetic engineering; soil/geosynthetic interaction and performance; laboratory and field geotechnical/geosynthetic testing; data acquisition and instrumentation; test equipment development and test method standardization; Quality System Management (QSM) and continuous improvement.

Sharon Walker, PhD *(Yale University) Dean of the College of Engineering*. Distinguished University Professor. Water quality systems engineering.

Michael Waring, PhD *(University of Texas-Austin) Associate Department Head for Undergraduate Programs; Director of Architectural Engineering Program*. Professor. Indoor air quality and building sustainability; indoor particulate matter fate and transport; indoor chemistry and particle formation; secondary impacts of control technologies and strategies.

Jin Wen, PhD *(University of Iowa)*. Professor. Building energy efficiency; building-grid interaction; building control and operation; fault detection and diagnosis; human-building interactions; dynamic building system simulation; big data.

Aspasia Zerva, PhD *(University of Illinois - Urbana)*. Professor. Earthquake engineering; engineering seismology; structural reliability; system identification; advanced computational methods in structural analysis.

Emeritus Faculty

A. Emin Aktan, PhD *(University of Illinois at Urbana-Champaign) John Roebling Emeritus Professor of Infrastructure Studies*. Professor Emeritus. Structural engineering; health monitoring of large infrastructure systems; infrastructure evaluation; intelligent systems.

Harry G. Harris, PhD *(Cornell University)*. Professor Emeritus. Structural models; dynamics of structures, plates and shells; industrialized building construction.

James E. Mitchell, MArch *(University of Pennsylvania)*. Professor Emeritus. Architectural engineering design; building systems; engineering education.

Joseph V. Mullin, PhD *(Pennsylvania State University) Associate Department Head*. Teaching Professor. Structural engineering; failure analysis; experimental stress analysis; materials of construction; marine structures; engineering education.

Richard Weggel, PhD *(University of Illinois) Samuel S. Baxter Professor Emeritus; Civil and Environmental Engineering*. Professor Emeritus. Coastal engineering; hydraulics engineering; hydrology.

Richard Woodring, PhD *(University of Illinois) Dean of Engineering Emeritus*. Professor Emeritus. Structural engineering, reinforced concrete.

Computer Engineering

Major: Computer Engineering
Degree Awarded: Bachelor of Science in Computer Engineering (BSCE)
Calendar Type: Quarter
Total Credit Hours: 183.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 14.0901
Standard Occupational Classification (SOC) code: 15-1132; 15-1133; 15-1143; 17-2031

About the Program

The major provides a broad focus on electronic circuits and systems, computer architecture, computer networking, embedded systems, programming and system software, algorithms, and computer security.

Computer engineers design smaller, faster, and more reliable computers and digital systems, build computer networks to transfer data, embed microprocessors in larger physical systems such as cars and planes, work on theoretical issues in computing, and design large-scale software systems. Computer engineers may work in positions that apply computers in control systems, digital signal processing, telecommunications, and power systems, and may design very large-scale integration (VLSI) integrated circuits and systems.

The computer engineering degree program is designed to provide our students with breadth in engineering, the sciences, mathematics, and the humanities, as well as depth in both software and hardware disciplines appropriate for a computer engineer. It embodies the philosophy and style of the Drexel Engineering Curriculum, and will develop the student's design and analytical skills. In combination with the co-op experience, it opens to the student opportunities in engineering practice, advanced training in engineering or in other professions, and an entry to business and administration.

The computer engineering program's courses in ECE are supplemented with courses from the departments of Mathematics and Computer Science. Students gain the depth of knowledge of computer hardware and software essential for the computer engineer.

Mission Statement

The ECE Department at Drexel University (http://drexel.edu/ece/) serves the public and the university community by providing superior career-integrated education in electrical and computer engineering; by conducting research in these fields, to generate new knowledge and technologies; and by promoting among all its constituents professionalism, social responsibility, civic engagement and leadership.

Program Educational Objectives

The Electrical and Computer Engineering Program Educational Objectives are such that its alumni, in their early years after graduation can:

- Secure positions and continue as valued, creative, dependable, and proficient employees in a wide variety of fields and industries, in particular as computer engineers.
- Succeed in graduate and professional studies if pursued, such as engineering, science, law, medicine and business.

- Embrace and pursue lifelong learning for a successful and rewarding career.
- Act as an ambassador for the field of engineering through clear, professional communication with technical and non-technical audiences, including the general public.
- Accept responsibility for leadership roles in their profession, in their communities, and in the global society.
- Contribute to their professional discipline's body of knowledge.
- Function as responsible members of society with an awareness of the social and ethical ramifications of their work.

Student Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of the engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Additional Information

The Computer Engineering program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (http://www.abet.org).

Additional information about the major is available on the ECE Department website (https://drexel.edu/engineering/academics/departments/electrical-computer-engineering/).

For advising questions, please contact the ECE advisor (https://drexel.edu/engineering/academics/departments/electrical-computer-engineering/resources/current-undergrad/).

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Students must take ENGL 101

General Education/Liberal Studies Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 315	Engineering Ethics	3.0
UNIV E101	The Drexel Experience	1.0
COM Elective [*]		3.0
General Education Requirements [**]		15.0
Foundation Requirements		
CHEM 101	General Chemistry I	3.5
ECE 105	Programming for Engineers II	3.0
ECE 200	Digital Logic Design	4.0
ECE 201	Foundations of Electric Circuits I	4.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
ENGR 113	First-Year Engineering Design	3.0
ENGR 131	Introductory Programming for Engineers	3.0
or ENGR 132	Programming for Engineers	
ENGR 231	Linear Engineering Systems	3.0
ENGR 232	Dynamic Engineering Systems	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 200	Multivariate Calculus	4.0
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
PHYS 201	Fundamentals of Physics III	4.0
Science Elective [***]		4.5
Professional Requirements		
CS 260	Data Structures	3.0
CS 265	Advanced Programming Tools and Techniques	3.0
ECE 301	Foundations of Electric Circuits II	4.0
ECE 303	ECE Laboratory	3.0
ECE 361	Probability and Data Analytics for Engineers	4.0
ECE 391	Introduction to Engineering Design Methods	1.0
ECE 491 [WI]	Senior Design Project I	2.0
ECE 492 [WI]	Senior Design Project II	2.0
ECE 493	Senior Design Project III	4.0
ECEC 201	Advanced Programming for Engineers	3.0
ECEC 204	Design with Microcontrollers	3.0
ECEC 302	Digital Systems Projects	3.0
ECEC 355	Computer Organization & Architecture	3.0
ECEC 357	Introduction to Computer Networks	3.0
ECES 301	Signals and Systems I	4.0
MATH 221	Discrete Mathematics	3.0
Computer Engineering Electives		**27.0**
Free Electives		**18.0**
Total Credits		183.0

[*]   COM Elective: Choose one of the following: COM 230 or COM 310 [WI]

[**]   General Education Requirements (p. 215).

[***]   Science elective: choose one of the following: BIO 122, BIO 141, CHEM 102

Note: In addition to completing 183.0 credits, students majoring in Computer Engineering must have a 2.0 cumulative overall GPA and a 2.0 cumulative GPA in their Professional Requirements courses.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic

advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
CHEM 101	General Chemistry I	3.5
COOP 101	Career Management and Professional Development	0.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
MATH 121	Calculus I	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	14.5
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 131 or 132	Introductory Programming for Engineers Programming for Engineers	3.0
MATH 122	Calculus II	4.0
PHYS 101	Fundamentals of Physics I	4.0
General Education Elective*		3.0
	Term Credits	15.0
Term 3		
ECE 105	Programming for Engineers II	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
ENGR 113	First-Year Engineering Design	3.0
MATH 200	Multivariate Calculus	4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	17.0
Term 4		
ECE 200	Digital Logic Design	4.0
ECEC 201	Advanced Programming for Engineers	3.0
ENGR 231	Linear Engineering Systems	3.0
PHYS 201	Fundamentals of Physics III	4.0
COM Elective**		3.0
	Term Credits	17.0
Term 5		
ECE 201	Foundations of Electric Circuits I	4.0
ECEC 204	Design with Microcontrollers	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
ENGR 232	Dynamic Engineering Systems	3.0

MATH 221	Discrete Mathematics	3.0
	Term Credits	16.0
Term 6		
CS 265	Advanced Programming Tools and Techniques	3.0
ECE 301	Foundations of Electric Circuits II	4.0
ECEC 302	Digital Systems Projects	3.0
ECEC 357	Introduction to Computer Networks	3.0
	Term Credits	13.0
Term 7		
CS 260	Data Structures	3.0
ECEC 355	Computer Organization & Architecture	3.0
ECES 301	Signals and Systems I	4.0
PHIL 315	Engineering Ethics	3.0
Free Elective		3.0
	Term Credits	16.0
Term 8		
ECE 303	ECE Laboratory	3.0
ECE 361	Probability and Data Analytics for Engineers	4.0
General Education Elective*		3.0
ECE Elective		3.0
Free Elective		3.0
	Term Credits	16.0
Term 9		
ECE 391	Introduction to Engineering Design Methods (Also offered spring term.)	1.0
Science Elective†		4.5
General Education elective*		3.0
Two ECE Electives		6.0
	Term Credits	14.5
Term 10		
ECE 491 [WI]	Senior Design Project I	2.0
One ECEC 4XX Elective††		3.0
One ECE Elective***		3.0
General Education Elective*		3.0
Free Elective		3.0
	Term Credits	14.0
Term 11		
ECE 492 [WI]	Senior Design Project II	2.0
One ECEC 4XX Elective††		3.0
One ECE Elective***		3.0
General Education Elective*		3.0
Free Elective		3.0
	Term Credits	14.0
Term 12		
ECE 493	Senior Design Project III	4.0
One ECEC 4XX Elective††		3.0
One ECE Elective***		3.0
Two Free Electives		6.0
	Term Credits	16.0

Total Credit: 183.0

* General Education Electives are courses taken from the COE approved list.

** COM Elective: Choose one of the following: COM 230 or COM 310 [WI]

*** ECE Electives (ECEX Elective) are at least 27.0 credits of ECE courses. At least 9.0 credits must be in ECEC courses at the 400# level or higher. Up to 12.0 credits may be taken from other approved departments.

† Science Elective: choose one of the following: BIO 122 BIO 141, CHEM 102

†† ECEC 4XX Electives are 400 level ECEC courses.

Note: In addition to completing 183.0 credits, students majoring in Computer Engineering must have a 2.0 cumulative overall GPA and a 2.0 cumulative GPA in their Professional Requirement courses.

Co-op/Career Opportunities

Drexel University's co-op program has an 80 year history and is one of the oldest and largest co-op programs in the world. Students graduate with 6-18 months of full time employment experience, depending on their choice of a 4-year or 5-year program. The majority of Computer Engineering students in ECE choose the 5-year program and graduate with 18 months of full-time work experience, and often receive a job offer from their third co-op employer or from a connection made from one of their co-op experiences.

Computer engineers work for computer and microprocessor manufacturers; manufacturers of digital devices for telecommunications, peripherals, electronics, control, and robotics; software engineering; the computer network industry; and related fields. A degree in computer engineering can also serve as an excellent foundation to pursue graduate professional careers in medicine, law, business, and government.

Graduates are also pursuing advanced studies in electrical and computer engineering, aerospace engineering, and mechanical engineering at such schools as MIT, Stanford, Princeton, Georgia Institute of Technology, University of California at Berkeley, University of Pennsylvania, and University of Maryland.

The Steinbright Career Development Center had a co-op placement rate of approximately 99% for electrical and computer engineering majors.

Co-op employers for computer engineering majors include:

- Lockheed Martin
- Comcast Corporation
- SAP America
- Susquehanna International Group LLC
- PJM Interconnection, LLC
- Dell
- National Board of Medical Examiners
- UNISYS Corporation
- Woodward McCoach, Inc.
- NAVSEA
- ClarivateAnalytics (Thomson Reuters)
- NVIDIA
- Excelon Corporation

For more information about the co-op process, please contact the Steinbright Career Development Center (http://drexel.edu/scdc/).

Dual Degree Bachelor's Program

With careful planning, students can complete both a Computer Engineering and an Electrical Engineering degree in the time usually required to complete one degree. For detailed information the student should contact the ECE advisor (http://drexel.edu/ece/academics/undergrad/advising/).

Bachelor's/Master's Dual Degree Program

Exceptional students can also pursue a master of science degree in the same period as the bachelor of science.

For more information on these and other options, visit the Department of Electrical and Computer Engineering BS/MS (http://drexel.edu/ece/academics/undergrad/bs-ms/) page.

Facilities

Drexel University and the Electrical and Computer Engineering Department are nationally recognized for a strong history of developing innovative research. Research programs in the ECE Department prepare students for careers in research and development, and aim to endow graduates with the ability to identify, analyze, and address new technical and scientific challenges. The ECE Department is well equipped with state-of-the-art facilities in each of the following ECE Research laboratories:

Research Laboratories at the ECE Department

Adaptive Signal Processing and Information Theory Research Group

The Adaptive Signal Processing and Information Theory Research Group (http://www.ece.drexel.edu/walsh/aspitrg/home.html) conducts research in the area of signal processing and information theory. Our main interests are belief/expectation propagation, turbo decoding and composite adaptive system theory. We are currently doing projects on the following topics:
i) Delay mitigating codes for network coded systems,
ii) Distributed estimation in sensor networks via expectation propagation,
iii) Turbo speaker identification,
iv) Performance and convergence of expectation propagation,
v) Investigating bounds for SINR performance of autocorrelation based channel shorteners.

Bioimage Laboratory

Uses computer gaming hardware for enhanced and affordable 3-D visualization, along with techniques from information theory and machine learning to combine the exquisite capabilities of the human visual system with computational sensing techniques for analyzing vast quantities of image sequence data.

Data Fusion Laboratory

The Data Fusion Laboratory investigates problems in multisensory detection and estimation, with applications in robotics, digital communications, radar, and target tracking. Among the projects in progress: computationally efficient parallel distributed detection architectures, data fusion for robot navigation, modulation recognition and RF scene analysis in time-varying environments, pattern recognition in biological data sequences and large arrays, and hardware realizations of data fusion architectures for target detection and target tracking.

Drexel Network Modeling Laboratory

The Drexel Network Modeling Laboratory investigates problems in the mathematical modeling of communication networks, with specific focus on wireless ad hoc networks, wireless sensor networks, and supporting guaranteed delivery service models on best effort and multipath routed networks. Typical methodologies employed in our research include mathematical modeling, computer simulation, and performance

optimization, often with the end goal of obtaining meaningful insights into network design principles and fundamental performance tradeoffs.

Drexel Power-Aware Computing Laboratory

The Power-Aware Computing Lab (http://dpac.ece.drexel.edu/) investigates methods to increase energy efficiency across the boundaries of circuits, architecture, and systems. Our recent accomplishments include the Sigil profiling tool, scalable modeling infrastructure for accelerator implementations, microarchitecture-aware VDD gating algorithms, an accelerator architecture for ultrasound imaging, evaluation of hardware reference counting, hardware and operating system support for power-agile computing, and memory systems for accelerator-based architectures.

Drexel University Nuclear Engineering Education Laboratory

The field of nuclear engineering encompasses a wide spectrum of occupations, including nuclear reactor design, medical imaging, homeland security, and oil exploration.The Drexel University Nuclear Engineering Education Laboratory (DUNEEL) provides fundamental hands on understanding for power plant design and radiation detection and analysis.Software based study for power plant design, as well as physical laboratory equipment for radiation detection, strengthen the underlying concepts used in nuclear engineering such that the student will comprehend and appreciate the basic concepts and terminology used in various nuclear engineering professions. Additionally, students use the laboratory to develop methods for delivering remote, live time radiation detection and analysis. The goal of DUNEEL is to prepare students for potential employment in the nuclear engineering arena.

Drexel VLSI Laboratory

The Drexel VLSI Laboratory investigates problems in the design, analysis, optimization and manufacturing of high performance (low power, high throughput) integrated circuits in contemporary CMOS and emerging technologies. Suited with industrial design tools for integrated circuits, simulation tools and measurement beds, the VLSI group is involved with digital and mixed-signal circuit design to verify the functionality of the discovered novel circuit and physical design principles. The Drexel VLSI laboratory develops design methodologies and automation tools in these areas, particularly in novel clocking techniques, featuring resonant clocking, and interconnects, featuring wireless interconnects.

Drexel Wireless Systems Laboratory

The Drexel Wireless Systems Laboratory (DWSL) contains an extensive suite of equipment for constructing, debugging, and testing prototype wireless communications systems. Major equipment within DWSL includes:

- three software defined radio network testbeds (HYDRA, USRP, and WARP) for rapidly prototyping radio, optical and ultrasonic communications systems,
- a TDK RF anechoic chamber and EMSCAN desktop antenna pattern measurement system,
- a materials printer and printed circuit board milling machine for fabricating conformal antennas and
- wireless protocol conformance testing equipment from Aeroflex.

The lab is also equipped with network analyzers, high speed signal generators, oscilloscopes, and spectrum analyzers as well as several Zigbee development platforms for rapidly prototyping sensor networks.

DWSL personnel also collaborate to create wearable, fabric based transceivers through collaboration with the Shima Seiki Haute Laboratory in the Drexel ExCITe Center.The knitting equipment at Drexel includes sixteen SDS-ONE APEX3 workstations and four state-of-the-art knitting machines. The workstations accurately simulate fabric construction and provide researchers and designers the opportunity to program, create and simulate textile prototypes, import CAD specifications of final products, and produce made-to-measure or mass-produced pieces on Shima Seiki knitting machines.For testing smart textiles for biomedical, DWSL personnel also have collaborators in the Center for Interdisciplinary Clinical Simulation and Practice (CICSP) in the Drexel College of Medicine which provides access to medical mannequin simulators.

Ecological and Evolutionary Signal-processing and Informatics Laboratory

The Ecological and Evolutionary Signal-processing and Informatics Laboratory (EESI) seeks to solve problems in high-throughput genomics and engineer better solutions for biochemical applications. The lab's primary thrust is to enhance the use of high-throughput DNA sequencing technologies with pattern recognition and signal processing techniques. Applications include assessing the organism content of an environmental sample, recognizing/classifying potential and functional genes, inferring environmental factors and inter-species relationships, and inferring microbial evolutionary relationships from short-read DNA/RNA fragments. The lab also investigates higher-level biological systems such as modeling and controlling chemotaxis, the movement of cells.

Electric Power Engineering Center

This newly established facility makes possible state-of-the-art research in a wide variety of areas, ranging from detailed theoretical model study to experimental investigation in its high voltage laboratories. The mission is to advance and apply scientific and engineering knowledge associated with the generation, transmission, distribution, use, and conservation of electric power. In pursuing these goals, this center works with electric utilities, state and federal agencies, private industries, nonprofit organizations and other universities on a wide spectrum of projects. Research efforts, both theoretical and experimental, focus on the solution of those problems currently faced by the electric power industry. Advanced concepts for electric power generation are also under investigation to ensure that electric power needs will be met at the present and in the future.

Electronic Design Automation Facility

Industrial-grade electronic design automation software suite and intergrated design environment for digital, analog and mixed-signal systems development. Field Programmable Gate Array (FPGA) development hardware. Most up-to-date FPGA/embedded system development hardware kits. Printed circuit board production facility. Also see Drexel VLSI Laboratory.

Microwave-Photonics Device Laboratories

The laboratory is equipped with test and measurement equipment for high-speed analog and digital electronics and fiber optic systems. The test equipment includes network analyzers from Agilent (100kHz- 1.3 GHz and 45 Mhz-40 GHz), and Anritsu (45 MHz-6 GHz); spectrum analyzers from Tektronix, HP, and Agilent with measurement capability of DC to 40 GHz and up to 90 GHz using external mixers; signal generators and communication channel modulators from HP, Rhode-Schwartz, Systron Donner, and Agilent; microwave power meter and sensor heads, assortment of passive and active microwave components up to 40 GHz ;

data pattern generator and BER tester up to 3Gb/s; optical spectrum analyzer from Anritsu and power meters from HP; single and multimode fiber optic based optical transmitter and receiver boards covering ITU channels at data rates up to 10Gb/s; passive optical components such as isolator, filter, couplers, optical connectors and fusion splicer; LPKF milling machine for fabrication of printed circuit boards; wire-bonding and Cascade probe stations; Intercontinental test fixtures for testing of MMIC circuits and solid-state transistors; state-of-the-art microwave and electromagnetic CAD packages such as Agilent ADS, ANSYS HFSS, and COMSOL multi-physics module.

Music and Entertainment Technology Laboratory

The Music and Entertainment Technology Laboratory (MET-lab) is devoted to research in digital media technologies that will shape the future of entertainment, especially in the areas of sound and music. We employ digital signal processing and machine learning to pursue novel applications in music information retrieval, music production and processing technology, and new music interfaces. The MET-lab is also heavily involved in outreach programs for K-12 students and hosts the Summer Music Technology program, a one-week learning experience for high school students. Lab facilities include a sound isolation booth for audio and music recording, a digital audio workstation running ProTools, two large multi-touch display interfaces of our own design, and a small computing cluster for distributed processing.

NanoPhotonics+ Lab

Our research is primarily in the area of nanophotonics with a focus on the nanoscale interaction of light with matter. Interests include: liquid crystal/polymer composites for gratings, lenses and HOEs; liquid crystal interactions with surfaces and in confined nanospaces; alternative energy generation through novel photon interactions; ink-jet printed conducting materials for RF and photonic applications; and the creation and development of smart textiles technologies including soft interconnects, sensors, and wireless implementations.

Opto-Electro-Mechanical Laboratory

This lab concentrates on the system integration on optics, electronics, and mechanical components and systems, for applications in imaging, communication, and biomedical research. Research areas include: Programmable Imaging with Optical Micro-electrical-mechanical systems (MEMS), in which microscopic mirrors are used to image light into a single photodetector; Pre-Cancerous Detection using White Light Spectroscopy, which performs a cellular size analysis of nuclei in tissue; Free-space Optical Communication using Space Time Coding, which consists of diffused light for computer-to-computer communications, and also tiny lasers and detectors for chip-to-chip communication; Magnetic Particle Locomotion, which showed that particles could swim in a uniform field; and Transparent Antennas using Polymer, which enables antennas to be printed through an ink-jet printer.

Plasma and Magnetics Laboratory

Research is focused on applications of electrical and magnetic technologies to biology and medicine. This includes the subjects of non-thermal atmospheric pressure plasma for medicine, magnetic manipulation of particles for drug delivery and bio-separation, development of miniature NMR sensors for cellular imaging and carbon nanotube cellular probes.

Power Electronics Research Laboratory

The Power Electronics Research Laboratory (PERL) is involved in circuit and design simulation, device modeling and simulation, and experimental testing and fabrication of power electronic circuits. The research and development activities include electrical terminations, power quality, solar photovoltaic systems, GTO modeling, protection and relay coordination, and solid-state circuit breakers. The analysis tools include EMPT, SPICE, and others, which have been modified to incorporate models of such controllable solid-state switches as SCRs, GTOs, and MOSFETs. These programs have a wide variety and range of modeling capabilities used to model electromagnetics and electromechanical transients ranging from microseconds to seconds in duration. The PERL is a fully equipped laboratory with 42 kVA AC and 70 kVA DC power sources and data acquisition systems, which have the ability to display and store data for detailed analysis. Some of the equipment available is a distribution and HV transformer and three phase rectifiers for power sources and digital oscilloscopes for data measuring and experimental analysis. Some of the recent studies performed by the PERL include static VAR compensators, power quality of motor controllers, solid-state circuit breakers, and power device modeling which have been supported by PECO, GE, Gould, and EPRI.

Testbed for Power-Performance Management of Enterprise Computing Systems

This computing testbed is used to validate techniques and algorithms aimed at managing the performance and power consumption of enterprise computing systems. The testbed comprises a rack of Dell 2950 and Dell 1950 PowerEdge servers, as well as assorted desktop machines, networked via a gigabit switch. Virtualization of this cluster is enabled by VMWare's ESX Server running the Linux RedHat kernel. It also comprises of a rack of ten Apple Xserve machines networked via a gigabit switch. These servers run the OS X Leopard operating systems and have access to a RAID with TBs of total disk capacity.

Computer Engineering Faculty

Tom Chmielewski, PhD *(Drexel University)*. Teaching Professor. Modeling and simulation of electro-mechanical systems; optimal, adaptive and non-linear control; DC motor control; system identification; kalman filters (smoothing algorithms, tracking); image processing; robot design; biometric technology and design of embedded systems for control applications utilizing MATLAB and SIMULINK

Fernand Cohen, PhD *(Brown University)*. Professor. Surface modeling; tissue characterization and modeling; face modeling; recognition and tracking.

Andrew Cohen, PhD *(Rensselaer Polytechnic Institute)*. Associate Professor. Image processing; multi-target tracking; statistical pattern recognition and machine learning; algorithmic information theory; 5-D visualization

Kapil Dandekar, PhD *(University of Texas-Austin) Director of the Drexel Wireless Systems Laboratory (DWSL); Associate Dean of Research, College of Engineering.* Professor. Cellular/mobile communications and wireless LAN; smart antenna/MIMO for wireless communications; applied computational electromagnetics; microwave antenna and receiver development; free space optical communication; ultrasonic communication; sensor networks for homeland security; ultrawideband communication.

Afshin Daryoush, ScD *(Drexel University)*. Professor. Digital and microwave photonics; nonlinear microwave circuits; RFIC; medical imaging.

Anup Das, PhD *(Universit of Singapore)*. Assistant Professor. Design of algorithms for neuromorphic computing, particularly using spiking neural networks, dataflow-based design of neuromorphic computing system, design of scalable computing system; hardware-software co-design and management, and thermal and power management of many-core embedded systems

Bruce A. Eisenstein, PhD *(University of Pennsylvania)*. Arthur J. Rowland Professor of Electrical and Computer Engineering. Pattern recognition; estimation; decision theory.

Adam K. Fontecchio, PhD *(Brown University) Director, Center for the Advancement of STEM Teaching and Learning Excellence (CASTLE)*. Professor. Electro-optics; remote sensing; active optical elements; liquid crystal devices.

Gary Friedman, PhD *(University of Maryland-College Park) Associate Department Head for Graduate Affairs*. Professor. Biological and biomedical applications of nanoscale magnetic systems.

Allon Guez, PhD *(University of Florida)*. Professor. Intelligent control systems; robotics, biomedical, automation and manufacturing; business systems engineering.

Peter R. Herczfeld, PhD *(University of Minnesota)*. Professor. Lightwave technology; microwaves; millimeter waves; fiberoptic and integrated optic devices.

Leonid Hrebien, PhD *(Drexel University)*. Professor. Tissue excitability; acceleration effects on physiology; bioinformatics.

Nagarajan Kandasamy, PhD *(University of Michigan) Associate Department Head for Undergraduate Affairs*. Associate Professor. Embedded systems, self-managing systems, reliable and fault-tolerant computing, distributed systems, computer architecture, and testing and verification of digital systems.

Youngmoo Kim, PhD *(MIT) Director, Expressive and Creative Interactive Technologies (ExCITe) Center*. Professor. Audio and music signal processing, voice analysis and synthesis, music information retrieval, machine learning.

Fei Lu, PhD *(University of Michigan)*. Assistant Professor. Power electronics; wireless power transfer technology for the high-power electric vehicles and the low-power electronic devices.

Karen Miu, PhD *(Cornell University)*. Professor. Power systems; distribution networks; distribution automation; optimization; system analysis.

Bahram Nabet, PhD *(University of Washington)*. Professor. Optoelectronics; fabrication and modeling; fiber optic devices; nanoelectronics; nanowires.

Prawat Nagvajara, PhD *(Boston University)*. Associate Professor. System on a chip; embedded systems; power grid computation; testing of computer hardware; fault-tolerant computing; VLSI systems; error control coding.

Dagmar Niebur, PhD *(Swiss Federal Institute of Technology)*. Associate Professor. Intelligent systems; dynamical systems; power system monitoring and control.

Christopher Peters, PhD *(University of Michigan)*. Teaching Professor. Nuclear reactor design; ionizing radiation detection; nuclear forensics; power plant reliability and risk analysis; naval/marine power and propulsion; directed energy/high power microwaves; nonstationary signal processing; radar; electronic survivability/susceptibility to harsh environments; electronic warfare

Karkal Prabhu, PhD *(Harvard University)*. Teaching Professor. Computer engineering education; computer architecture; embedded systems

Gail L. Rosen, PhD *(Georgia Institute of Technology)*. Associate Professor. Signal processing, signal processing for biological analysis and modeling, bio-inspired designs, source localization and tracking.

Ioannis Savidis, PhD *(University of Rochester)*. Associate Professor. Analysis, modeling, and design methodologies for high performance digital and mixed-signal integrated circuits; Emerging integrated circuit technologies; Electrical and thermal modeling and characterization, signal and power integrity, and power and clock delivery for 3-D IC technologies

Kevin J. Scoles, PhD *(Dartmouth College) Associate Dean for Undergraduate Affairs*. Associate Professor. Microelectronics; electric vehicles; solar energy; biomedical electronics.

Harish Sethu, PhD *(Lehigh University)*. Associate Professor. Protocols, architectures and algorithms in computer networks; computer security; mobile ad hoc networks; large-scale complex adaptive networks and systems.

James Shackleford, PhD *(Drexel University)*. Associate Professor. Medical image processing, high performance computing, embedded systems, computer vision, machine learning

P. Mohana Shankar, PhD *(Indian Institute of Technology) Allen Rothwarf Professor of Electrical and Computer Engineering*. Professor. Wireless communications; biomedical ultrasonics; fiberoptic bio-sensors.

Matthew Stamm, PhD *(University of Maryland, College Park)*. Associate Professor. Information Security; multimedia forensics and anti-forensics; information verification; adversarial dynamics; signal processing

Baris Taskin, PhD *(University of Pittsburgh)*. Professor. Very large-scal integration (VLSI) systems, computer architecture, circuits and systems, electronic design automation (EDA), energy efficient computing.

John Walsh, PhD *(Cornell University)*. Associate Professor. Bounding the region of entropic vectors and its implications for the limits of communication networks, big data distributed storage systems, and graphical model based machine learning; efficient computation and analysis of rate regions for network coding and distributed storage; code construction, polyhedral computation, hierarchy, and symmetry

Steven Weber, PhD *(University of Texas-Austin) Department Head*. Professor. Mathematical modeling of computer and communication networks, specifically streaming multimedia and ad hoc networks.

Jaudelice de Oliveira, PhD *(Georgia Institute of Technology)*. Associate Professor. Software-defined networking; social and economic networks; network security; design and analysis of protocols, algorithms and architectures in computer networks, particularly solutions for the Internet of Things

Emeritus Faculty

Suryadevara Basavaiah, PhD *(University of Pennsylvania)*. Professor Emeritus. Computer engineering; computer engineering education; custom circuit design; VLSI technology; process and silicon fabrication

Eli Fromm, PhD *(Jefferson Medical College)*. Professor Emeritus. Engineering education; academic research policy; bioinstrumentation; physiologic systems.

Edwin L. Gerber, PhD *(University of Pennsylvania)*. Professor Emeritus. Computerized instruments and measurements; undergraduate engineering education.

Construction Management

Major: Construction Management
Degree Awarded: Bachelor of Science in Construction Management (BSCMGT)
Calendar Type: Quarter
Total Credit Hours: 186.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 52.2001
Standard Occupational Classification (SOC) code: 11-9021

About the Program

Construction management is a dynamic profession that is a combination of art and science. While an understanding of the technical aspects of construction is extremely important, it is also essential that construction professionals have knowledge of the business and management aspects of the profession. While construction has traditionally been a very conservative industry, the increasing rate of technological development and competition in the industry serves to accelerate the development of new construction methods, equipment, materials, and management techniques. As a result of these forces, there is an increasing need for innovative and professionally competent construction professionals.

The Construction Management major prepares students for all phases of operation and management of the construction organization including cost estimating, project scheduling, and planning, in addition to technology courses, sustainability, BIM and Virtual Design and Construction. Students are able to choose from a wide range of subjects in the social sciences and humanities to satisfy electives in the liberal arts and free elective requirements. Pursuing part-time, degree completion on average takes six years.

Students in Drexel's Construction Management program receive broad academic, technical, business, and construction management courses that are designed to produce well-rounded construction professionals. Students interested in extending their construction management studies into real estate development should consider the concentration in real estate. This concentration in real estate is designed for students to attain the knowledge and skills required to create and maintain built environments for living, working and entertainment purposes, as well as to explore issues in the real estate development process and the industry as a whole.

Program Delivery Options

Program delivery options for the Construction Management program include:

- A traditional 5-year with co-op
- 4-year with one co-op
- A part-time study option

Additional Information

For additional information, visit the Construction Management (https://drexel.edu/engineering/academics/departments/construction-engineering-project-management-systems-engineering/) website or contact:

Jessica Cruz
215.895.5943
jc635@drexel.edu

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

English/Communication		
COM 230	Techniques of Speaking	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
Mathematics		
MATH 110	Precalculus	3.0
MATH 121	Calculus I	4.0
Science		
GEO 101	Physical Geology	4.0
PHYS 151	Applied Physics	3.0
One Physical Science Elective		3.0
Business		
ACCT 110	Accounting for Professionals	4.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
STAT 201	Introduction to Business Statistics	4.0
One Business Elective		4.0
Humanities and Social Science		
PHIL 315	Engineering Ethics	3.0
Three Humanities and Social Science Electives		9.0
Engineering Core		
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
ENGR 113	First-Year Engineering Design	3.0
Professional Core - Construction Science		
CMGT 161	Building Materials and Construction Methods I	3.0
CMGT 162	Building Materials and Construction Methods II	3.0
CMGT 163	Building Materials and Construction Methods III	3.0
CMGT 251	Construction Surveying	3.0
CMGT 265	Information Technologies in Construction	3.0
CMGT 266	Building Systems I	3.0
CMGT 267	Building Systems II	3.0
CMGT 270	Principles of Statics for Construction Management	3.0
CMGT 365	Soil Mechanics in Construction	4.0
CMGT 371	Structural Aspects in Construction I	3.0
CMGT 372	Structural Aspects in Construction II	3.0
Professional Core - Construction		

CMGT 101	Introduction to Construction Management	3.0
CMGT 240 [WI]	Economic Planning for Construction	3.0
CMGT 261	Construction Safety	3.0
CMGT 263	Understanding Construction Drawings	3.0
CMGT 355	Introduction to Sustainability in Construction	3.0
CMGT 361	Contracts And Specifications I	3.0
CMGT 362	Contracts and Specifications II	3.0
CMGT 363	Estimating I	3.0
CMGT 364	Estimating II	3.0
CMGT 375	Building Information Modeling in Construction	3.0
CMGT 450	Management of Field Operations	3.0
CMGT 461	Construction Project & Company Management	3.0
CMGT 463	Value Engineering	3.0
CMGT 467	Techniques of Project Control	4.0
Professional Core - Professional Techniques		
CMGT 385 [WI]	Selling and Negotiation Techniques in Construction	3.0
CMGT 485	Habits of Successful Design and Build Construction	3.0
CMGT 486	Leading in the Construction Industry	3.0
Construction Electives		
Select three of the following:		9.0
CMGT 262	Building Codes	
CMGT 451	Heavy Construction Principles & Practices	
CMGT 468	Real Estate	
CMGT 469	Construction Seminar: Contemporary Issues	
CMGT 470	Productivity in Construction	
CMGT I499	Independent Study in CMGT	
Other Approved CMGT Elective [*]		
Construction Capstone		
CMGT 491	Senior Capstone I	3.0
CMGT 492	Senior Capstone II	3.0
CMGT 493	Senior Capstone III	3.0
University Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
UNIV G101	The Drexel Experience	1.0
Free Electives		**9.0**
Total Credits		186.0

[*]   Students may choose another construction elective but the permission of the Program is required.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		**Credits**
CMGT 161	Building Materials and Construction Methods I	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
MATH 110	Precalculus	3.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	13.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
CMGT 101	Introduction to Construction Management	3.0
CMGT 162	Building Materials and Construction Methods II	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 121	Calculus I	4.0
PHYS 151	Applied Physics	3.0
	Term Credits	17.0
Term 3		
ACCT 110	Accounting for Professionals	4.0
CMGT 163	Building Materials and Construction Methods III	3.0
CMGT 263	Understanding Construction Drawings	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
ENGR 113	First-Year Engineering Design	3.0
	Term Credits	16.0
Term 4		
CMGT 261	Construction Safety	3.0
CMGT 251	Construction Surveying	3.0
ECON 201	Principles of Microeconomics	4.0
GEO 101	Physical Geology	4.0
Free elective		3.0
	Term Credits	17.0
Term 5		
CMGT 240 [WI]	Economic Planning for Construction	3.0
CMGT 270	Principles of Statics for Construction Management	3.0
COM 230	Techniques of Speaking	3.0
ECON 202	Principles of Macroeconomics	4.0
Physical Science Elective		3.0
	Term Credits	16.0
Term 6		
CMGT 266	Building Systems I	3.0
CMGT 363	Estimating I	3.0
CMGT 371	Structural Aspects in Construction I	3.0
PHIL 315	Engineering Ethics	3.0
STAT 201	Introduction to Business Statistics	4.0
	Term Credits	16.0
Term 7		
CMGT 265	Information Technologies in Construction	3.0
CMGT 267	Building Systems II	3.0
CMGT 364	Estimating II	3.0
CMGT 372	Structural Aspects in Construction II	3.0

CMGT 385 [WI]	Selling and Negotiation Techniques in Construction	3.0
	Term Credits	15.0
Term 8		
CMGT 355	Introduction to Sustainability in Construction	3.0
CMGT 361	Contracts And Specifications I	3.0
CMGT 375	Building Information Modeling in Construction	3.0
FIN 301	Introduction to Finance	4.0
Humanities/Social science elective		3.0
	Term Credits	16.0
Term 9		
CMGT 362	Contracts and Specifications II	3.0
CMGT 365	Soil Mechanics in Construction	4.0
CMGT 485	Habits of Successful Design and Build Construction	3.0
Business elective		4.0
Construction Management elective*		3.0
	Term Credits	17.0
Term 10		
CMGT 463	Value Engineering	3.0
CMGT 467	Techniques of Project Control	4.0
CMGT 491	Senior Capstone I	3.0
Construction Management elective*		3.0
Humanities/Social science elective		3.0
	Term Credits	16.0
Term 11		
CMGT 450	Management of Field Operations	3.0
CMGT 461	Construction Project & Company Management	3.0
CMGT 486	Leading in the Construction Industry	3.0
CMGT 492	Senior Capstone II	3.0
Humanities/Social science elective		3.0
	Term Credits	15.0
Term 12		
CMGT 493	Senior Capstone III	3.0
Construction Management elective*		3.0
Free electives		6.0
	Term Credits	12.0

Total Credit: 186.0

*   See degree requirements (p.   ).

Real Estate Concentration

The concentration in real estate provides students with training in issues such as project finance, real estate as investment, design and construction, operations, development law, environmental remediation, public policy, market analysis, and architecture. For this specialization, students take the same Construction Management (CMGT) core requirements, replacing some electives with the concentration-specific courses.

English/Communication		
COM 230	Techniques of Speaking	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
Mathematics		
MATH 110	Precalculus	3.0
MATH 121	Calculus I	4.0
Science		

GEO 101	Physical Geology	4.0
PHYS 151	Applied Physics	3.0
One Physical Science Elective		3.0
Business		
ACCT 110	Accounting for Professionals	4.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
STAT 201	Introduction to Business Statistics	4.0
One Business Elective		4.0
Humanities and Social Science		
PHIL 315	Engineering Ethics	3.0
Two Humanities and Social Science Electives		6.0
Engineering Core		
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
ENGR 113	First-Year Engineering Design	3.0
Professional Core - Construction Science		
CMGT 161	Building Materials and Construction Methods I	3.0
CMGT 162	Building Materials and Construction Methods II	3.0
CMGT 163	Building Materials and Construction Methods III	3.0
CMGT 251	Construction Surveying	3.0
CMGT 265	Information Technologies in Construction	3.0
CMGT 266	Building Systems I	3.0
CMGT 267	Building Systems II	3.0
CMGT 270	Principles of Statics for Construction Management	3.0
CMGT 365	Soil Mechanics in Construction	4.0
CMGT 371	Structural Aspects in Construction I	3.0
CMGT 372	Structural Aspects in Construction II	3.0
Professional Core - Construction		
CMGT 101	Introduction to Construction Management	3.0
CMGT 240 [WI]	Economic Planning for Construction	3.0
CMGT 261	Construction Safety	3.0
CMGT 263	Understanding Construction Drawings	3.0
CMGT 355	Introduction to Sustainability in Construction	3.0
CMGT 361	Contracts And Specifications I	3.0
CMGT 362	Contracts and Specifications II	3.0
CMGT 363	Estimating I	3.0
CMGT 364	Estimating II	3.0
CMGT 375	Building Information Modeling in Construction	3.0
CMGT 450	Management of Field Operations	3.0
CMGT 461	Construction Project & Company Management	3.0
CMGT 463	Value Engineering	3.0
CMGT 467	Techniques of Project Control	4.0
Professional Core - Professional Techniques		
CMGT 385 [WI]	Selling and Negotiation Techniques in Construction	3.0
CMGT 485	Habits of Successful Design and Build Construction	3.0
CMGT 486	Leading in the Construction Industry	3.0
Construction Capstone		
CMGT 491	Senior Capstone I	3.0
CMGT 492	Senior Capstone II	3.0
CMGT 493	Senior Capstone III	3.0
Concentration in Real Estate		
ARCH 432	The Development Process	3.0
CMGT 468	Real Estate	3.0
REAL 310	Introduction to Real Estate	3.0
REAL 320	Real Estate Law - Principle & Practice	3.0
REAL 330	Facilities Management	3.0
REAL 470	Real Estate Investments - Market & Feasibility Analysis	3.0
University Requirements		
Free Electives		**3.0**
CIVC 101	Introduction to Civic Engagement	1.0

UNIV E101	The Drexel Experience	1.0
Total Credits		186.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Career Opportunities

The graduates of the construction management program have secured positions as project managers, estimators, schedulers, and field superintendents for general contractors, subcontractors, and construction managers. Many are employed as owner representatives working for architectural firms, consulting engineering firms, commercial companies and institutions that have needs for building or other construction projects. Some have risen to executive positions within companies while others own their own firms. Graduates have also returned to the program after obtaining positions in the field to teach and share expertise.

The College of Engineering offers a Bachelor of Science in Construction Management as well as a Certificate Program in Construction Management. Depending on student goals, each option provides a strong educational foundation for successful performance and/or entrance into the construction industry.

Employers

Some of the companies that have hired Drexel students as co-op or full-time employees:

- Gilbane Building Company
- L.F. Driscoll Construction Company
- Allan Myers
- Pennoni Associates
- Brandywine Realty Trust
- Turner Construction Company
- Intech Construction Managers
- Urban Engineers, Inc.

Potential Careers

Construction Manager: Coordinates a venture from its initial development through final construction. Develops a schedule and ensures the project is completed on time and within budget. Obtains necessary licenses and permits and oversees the progress of the project.

Cost Estimator: Prepares information about costs that are necessary for a business to bid on a contract or to determine the profitability of a proposed product. Assembles information about factors that can influence costs such as materials, labor, location, and special machinery requirements, including computer hardware and software.

Project Manager: Develops requirements, budgets, and timetables for a firm's construction plans to ensure that the projects are successful. Determines the tasks to complete, assigns responsibilities to team members, and sees the project through from conception to completion.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more information on career opportunities.

Construction Management Faculty

Jeffrey Beard, PhD *(Georgia Institute of Technology)*. Associate Clinical Professor. Project and Program Management; Entrepreneurship in design and construction; Integrated project delivery systems; History of engineering and construction; Sustainable design and construction.

Douglas Carney, MBA, AIA *(Eastern University)*. Clinical Professor. Architecture; Contract management; Master planning; Site analysis; Feasibility and zoning issues; Space needs and program development; Code analysis and compliance studies; project scheduling.

Johanna Casale, PhD *(Rutgers University)*. Assistant Teaching Professor. Engineering education, first year design, structural aspects of construction.

Charles Cook, PhD *(New York University)*. Assistant Clinical Professor. Construction management; project management; leadership and teambuilding; oral and written communication.

Christine M. Fiori, PhD *(Drexel University) Program Director*. Clinical Professor. Improving the delivery of safety education in construction curriculum; Ancient construction techniques; Design and construction in developing countries; Leadership in construction; Workforce development

Kathleen M. Short, PhD *(Virginia Tech)*. Assistant Teaching Professor. Workforce development and women in construction; transformative safety leadership; construction education.

Electrical Engineering

Major: Electrical Engineering
Degree Awarded: Bachelor of Science in Electrical Engineering (BSEE)
Calendar Type: Quarter
Total Credit Hours: 184.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 14.1001
Standard Occupational Classification (SOC) code: 17-2071

About the Program

Electrical engineers contribute to industry and research in diverse areas such as electronic circuits, lasers and photonics, semiconductor devices, computer and communication networks, wireless networks, biomedical engineering, bioinformatics, machine learning, automation and control, and power and energy systems. The electrical engineering major emphasizes the fundamentals of electrical engineering, hands-on learning, and flexibility in course selection to satisfy diverse career goals.

Students choose one or more areas of study beginning in their pre-junior year.

State-of-the-art interdisciplinary courses have been developed to prepare the Drexel engineer for the technical challenges and the business atmosphere of the 21st century. Strong emphasis is given to the role of the engineer in the global competitive economy, and to the need to work closely with experts and practitioners in many fields.

Students can choose courses in various areas of study, including telecommunications, digital signal processing, electronics, automation, and power and systems and control.

Mission Statement

The ECE Department at Drexel University serves the public and the university community by providing superior career-integrated education in electrical and computer engineering; by conducting research in these fields, to generate new knowledge and technologies; and by promoting among all its constituents professionalism, social responsibility, civic engagement and leadership.

Program Educational Objectives

The Electrical and Computer Engineering Program Educational Objectives are that its alumni in their early years after graduation:

- Secure positions and continue as valued, creative, dependable, and proficient employees in a wide variety of fields and industries, in particular as electrical engineers.
- Succeed in graduate and professional studies if pursued, such as engineering, science, law, medicine, and business.
- Embrace and pursue lifelong learning for a successful and rewarding career.
- Act as an ambassador for the field of engineering through clear, professional communication with technical and non-technical audiences, including the general public.
- Accept responsibility for leadership roles in their profession, in their communities, and in the global society.
- Contribute to their professional discipline's body of knowledge.
- Function as responsible members of society with an awareness of the social and ethical ramifications of their work.

Student Outcomes

The department's student outcomes reflect the skills and abilities that the curriculum is designed to provide to students by the time they graduate. These are:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of the engineering solutions in global, economic, environmental, and societal contexts

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Areas of Study

Telecommunications and Digital Signal Processing (DSP)

Telecommunications and digital signal processing (DSP) are two of the fastest-growing fields of electrical engineering. The telecommunications and DSP areas of study prepare students for mastery of fundamental and applied knowledge in the theory and the technology of the transmission and processing of information-bearing signals such as voice, audio, data, images, and video. The curriculum includes core courses in electromagnetic propagation, communication devices and media, signal processing, analog and digital communication. Complementary electives can be taken in computers, electronics, control systems, and electric power systems.

Career opportunities include design and development of digital communications systems and telephony, speech recognition systems, fiber-optic networks, digital radio, medical diagnostic image processing, high-definition television, cellular and wireless communications, satellite communications, networked multimedia communications, and personal communication systems.

Electronics

The electronics area of study constitutes the study of electronic and optical semiconductor devices; analog and digital electronic circuits; and generation, transmission, and reception of information both in optical and microwave frequency ranges and guided or free-space conditions.

Career opportunities include jobs in telecommunications (optical, wireless, wired, satellite, and radar), VLSI (analog and digital), aerospace, remote sensing and instrumentation, computer circuitry interface, biomedical instrumentation, semiconductor device fabrication, and transportation.

Power and Systems/Control

Power and Systems/Control has at its core the areas of controls engineering and electric power engineering, the classic core of electrical engineering, and exploits the synergies between these two areas. These areas of study explores subjects such as modeling, analysis and control of dynamic systems including power systems, planning and optimization, electromechanical energy conversion, motor operation and control, transformers, power electronics, sensors and actuators, and the electrical and economic structure of the power industry. These areas of study offer access to two state-of-the-art laboratories. In the Interconnected Power System Laboratory, students can operate and control a small power system through the fusing of computer software and hardware technology with high-voltage, high-power technology. The Ortlip Systems Laboratory houses various experiments in sensing, feedback, and control. Both laboratories stress the use of modeling software, especially MATLAB, and the integrated use of computers and hardware.

Career opportunities include options ranging from manufacturing, the power industry (generation, transmission, distribution, marketing, and consumption), robotics, and transportation to Wall Street.

Additional Information

The Electrical Engineering program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (http://www.abet.org).

Additional information about the major is available on the ECE Department website (https://drexel.edu/engineering/academics/departments/electrical-computer-engineering/).

For advising questions, please contact the ECE advisor (https://drexel.edu/engineering/academics/departments/electrical-computer-engineering/resources/current-undergrad/).

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

In addition to completing 184.0 credits, students majoring in electrical engineering student must have a 2.0 cumulative overall GPA and a 2.0 cumulative GPA in their Electrical Engineering courses.

General Education/Liberal Studies Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 315	Engineering Ethics	3.0
UNIV E101	The Drexel Experience	1.0
COM Elective *		3.0
General Education Courses **		15.0
Foundation Requirements		
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 200	Multivariate Calculus	4.0
Math Elective ***		3.0
CHEM 101	General Chemistry I	3.5
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
PHYS 201	Fundamentals of Physics III	4.0
Science Elective †		4.5
ECE 105	Programming for Engineers II	3.0
ECE 200	Digital Logic Design	4.0
ECE 201	Foundations of Electric Circuits I	4.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
ENGR 113	First-Year Engineering Design	3.0
ENGR 131	Introductory Programming for Engineers	3.0
or ENGR 132	Programming for Engineers	
ENGR 220	Fundamentals of Materials	4.0
ENGR 231	Linear Engineering Systems	3.0
ENGR 232	Dynamic Engineering Systems	3.0
Sophomore Engineering Elective Options		
Select one of the following:		3.0-5.0

CHEM 103	General Chemistry III	
ECES 201	Introduction to Audio-Visual Signals	
ENGR 210	Introduction to Thermodynamics	
MATH 221	Discrete Mathematics	
Professional Requirements		
ECE 301	Foundations of Electric Circuits II	4.0
ECE 303	ECE Laboratory	3.0
ECE 361	Probability and Data Analytics for Engineers	4.0
ECE 391	Introduction to Engineering Design Methods	1.0
ECE 491 [WI]	Senior Design Project I	2.0
ECE 492 [WI]	Senior Design Project II	2.0
ECE 493	Senior Design Project III	4.0
ECES 301	Signals and Systems I	4.0
ECES 303	Signals and Systems II	3.0
ECE Electives ††		42.0
Free Electives		**15.0**
Total Credits		184.0-186.0

* COMs Elective: Choose one of the following: COM 230 or COM 310 [WI]

** General Education Courses (p. 215).

*** The math elective is a 3.0-4.5 credit course from MATH at a 200-level or higher. MATH 291 (*Complex & Vector Analysis*) is recommended for EE majors.

† Science elective: choose one of the following: BIO 122, BIO 141, CHEM 102

†† ECE Electives (ECEX Elective) are at least 42.0 credits of ECE courses. At least 9.0 credits must be in the major at the 400#level or higher. Up to 12.0 credits may be taken from other approved departments.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

5 YR UG Co-op Concentration

Term 1		Credits
CHEM 101	General Chemistry I	3.5
COOP 101	Career Management and Professional Development	0.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
MATH 121	Calculus I	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	14.5
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 131 or 132	Introductory Programming for Engineers / Programming for Engineers	3.0
MATH 122	Calculus II	4.0
PHYS 101	Fundamentals of Physics I	4.0
General Education Elective*		3.0
	Term Credits	15.0
Term 3		
ECE 105	Programming for Engineers II	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
ENGR 113	First-Year Engineering Design	3.0
MATH 200	Multivariate Calculus	4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	17.0
Term 4		
ECE 200	Digital Logic Design	4.0
ENGR 220	Fundamentals of Materials	4.0
ENGR 231	Linear Engineering Systems	3.0
PHYS 201	Fundamentals of Physics III	4.0
	Term Credits	15.0
Term 5		
ECE 201	Foundations of Electric Circuits I	4.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
ENGR 232	Dynamic Engineering Systems	3.0
Math Elective**		3.0
Free elective		3.0
	Term Credits	16.0
Term 6		
ECE 301	Foundations of Electric Circuits II	4.0
ECE 361	Probability and Data Analytics for Engineers	4.0
ECES 301	Signals and Systems I	4.0
COM Elective††		3.0
ECE Elective***		3.0
	Term Credits	18.0
Term 7		
ECES 303	Signals and Systems II	3.0
PHIL 315	Engineering Ethics	3.0
Two ECE Electives***		6.0
Sophomore Engineering Elective†		3.0
	Term Credits	15.0
Term 8		
ECE 303	ECE Laboratory	3.0
Two ECE Electives***		6.0
Free Elective		3.0
General Education Elective*		3.0
	Term Credits	15.0
Term 9		
ECE 391	Introduction to Engineering Design Methods (Also offered spring term.)	1.0
General Education Elective*		3.0
Two ECE Electives***		6.0
Science Elective†††		4.5
	Term Credits	14.5
Term 10		
ECE 491 [WI]	Senior Design Project I	2.0
ECE Elective***		3.0
ECEP/S/E 4XX Elective		4.0
General Education Elective*		3.0
Free Elective		3.0
	Term Credits	15.0
Term 11		
ECE 492 [WI]	Senior Design Project II	2.0
ECE Elective***		3.0
ECEP/S/E 4XX Elective		4.0
General Education Elective*		3.0
Free Elective		3.0
	Term Credits	15.0
Term 12		
ECE 493	Senior Design Project III	4.0
ECE Elective***		3.0
ECEP/S/E 4XX Elective		4.0
Free Elective		3.0
	Term Credits	14.0

Total Credit: 184.0

* General Education Electives must be taken from the COE approved list.

** The math elective is a 3.0-4.5 credit course from MATH at a 200-level or higher. MATH 291 (*Complex & Vector Analysis*) is recommended for EE majors.

*** ECE Electives (ECEX Elective) are at least 42.0 credits of ECE courses. At least 9.0 credits must be in the major at the 400#level or higher. Up to 12.0 credits may be taken from other approved departments.

† Sophomore Engineering Elective - Choose one of the following: ENGR 210, ECES 201, MATH 221, and CHEM 103

†† COM Elective: Choose one of the following: COM 230 or COM 310 [WI]

††† Science Elective - Choose one of the following: BIO 122, BIO 141, CHEM 102

Note: 184.0 credits are needed for graduation. In addition, an ECE student must have a 2.0 cumulative overall GPA and a 2.0 cumulative GPA in their ECE Professional Requirements.

Co-op/Career Opportunities

Top co-op employers for electrical engineering majors include:

- PJM Interconnection LLC
- Exelon Corporation (PECO)
- Lockheed Martin
- Woodward McCoach, Inc.
- NAVSEA
- EwingCole
- Schweitzer Engineering Laboratories Inc.
- Ametek, Inc.
- SAP America

- Comcast Corporation
- Susquehanna Int'l Group LLP
- L-3 Communications
- Philadelphia Department of Commerce
- Philadelphia Water Department

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) for more detailed information on co-op and post-graduate opportunities.

Drexel University's co-op program has an 80 year history and is one of the oldest and largest co-op programs in the world. Students graduate with 6-18 months of full time employment experience, depending on their choice of a 4-year or 5-year program. The majority of Computer Engineering students in ECE choose the 5-year program and graduate with 18 months of full-time work experience, and often receive a job offer from their third co-op employer or from a connection made from one of their co-op experiences.

Electrical engineers are employed in corporations, government agencies, and other organizations. In their work, these engineers are developers of electrical equipment for digital communications (such as satellite communication, fiber-optic networks, and coding and cryptography), mobile radio, radar and surveillance, process control, robotics, speech processing, aerospace circuitry, power generation and distribution, computer hardware and software, computer networks, sensor technology, counter-crime measures, electronic compatibility, consumer electronics, and related fields.
Graduates are also pursuing advanced studies in electrical and computer engineering, aerospace engineering, and mechanical engineering at such schools as MIT, Stanford, Princeton, Georgia Institute of Technology, University of California at Berkeley, University of Pennsylvania, and University of Maryland.

The Steinbright Career Development Center had a co-op placement rate of approximately 99% for electrical and computer engineering majors.

A degree in electrical engineering can also serve as an excellent foundation to pursue graduate professional careers in medicine, law, business, and government.

Dual Degrees

Dual Degree Bachelor's Program

With careful planning, students can complete both an Electrical Engineering degree and a Computer Engineering degree in the time usually required to complete one degree. For detailed information the student should contact the ECE advisor (http://drexel.edu/ece/academics/undergrad/advising/).

Bachelor's/Master's Dual Degree Program

Exceptional students can also pursue a master of science degree in the same period as the bachelor of science.

For more information on these and other options, visit the Department of Electrical and Computer Engineering BS/MS (http://drexel.edu/ece/academics/undergrad/bs-ms/) page.

Facilities

Drexel University and the Electrical and Computer Engineering Department are nationally recognized for a strong history of developing innovative research. Research programs in the ECE Department prepare students for careers in research and development, and aim to endow graduates with the ability to identify, analyze, and address new technical and scientific challenges. The ECE Department is well equipped with state-of-the-art facilities in each of the following ECE Research laboratories:

Research Laboratories at the ECE Department

Adaptive Signal Processing and Information Theory Research Group

The Adaptive Signal Processing and Information Theory Research Group (http://www.ece.drexel.edu/walsh/aspitrg/home.html) conducts research in the area of signal processing and information theory. Our main interests are belief/expectation propagation, turbo decoding and composite adaptive system theory. We are currently doing projects on the following topics:
i) Delay mitigating codes for network coded systems,
ii) Distributed estimation in sensor networks via expectation propagation,
iii) Turbo speaker identification,
iv) Performance and convergence of expectation propagation,
v) Investigating bounds for SINR performance of autocorrelation based channel shorteners.

Bioimage Laboratory

Uses computer gaming hardware for enhanced and affordable 3-D visualization, along with techniques from information theory and machine learning to combine the exquisite capabilities of the human visual system with computational sensing techniques for analyzing vast quantities of image sequence data.

Data Fusion Laboratory

The Data Fusion Laboratory investigates problems in multisensory detection and estimation, with applications in robotics, digital communications, radar, and target tracking. Among the projects in progress: computationally efficient parallel distributed detection architectures, data fusion for robot navigation, modulation recognition and RF scene analysis in time-varying environments, pattern recognition in biological data sequences and large arrays, and hardware realizations of data fusion architectures for target detection and target tracking.

Drexel Network Modeling Laboratory

The Drexel Network Modeling Laboratory investigates problems in the mathematical modeling of communication networks, with specific focus on wireless ad hoc networks, wireless sensor networks, and supporting guaranteed delivery service models on best effort and multipath routed networks. Typical methodologies employed in our research include mathematical modeling, computer simulation, and performance optimization, often with the end goal of obtaining meaningful insights into network design principles and fundamental performance tradeoffs.

Drexel Power-Aware Computing Laboratory

The Power-Aware Computing Lab (http://dpac.ece.drexel.edu/) investigates methods to increase energy efficiency across the boundaries of circuits, architecture, and systems. Our recent accomplishments include the Sigil profiling tool, scalable modeling infrastructure for accelerator implementations, microarchitecture-aware VDD gating algorithms, an accelerator architecture for ultrasound imaging, evaluation of hardware reference counting, hardware and operating system support

for power-agile computing, and memory systems for accelerator-based architectures.

Drexel University Nuclear Engineering Education Laboratory

The field of nuclear engineering encompasses a wide spectrum of occupations, including nuclear reactor design, medical imaging, homeland security, and oil exploration. The Drexel University Nuclear Engineering Education Laboratory (DUNEEL) provides fundamental hands on understanding for power plant design and radiation detection and analysis. Software based study for power plant design, as well as physical laboratory equipment for radiation detection, strengthen the underlying concepts used in nuclear engineering such that the student will comprehend and appreciate the basic concepts and terminology used in various nuclear engineering professions. Additionally, students use the laboratory to develop methods for delivering remote, live time radiation detection and analysis. The goal of DUNEEL is to prepare students for potential employment in the nuclear engineering arena.

Drexel VLSI Laboratory

The Drexel VLSI Laboratory (http://vlsi.ece.drexel.edu/?title=Main_Page) investigates problems in the design, analysis, optimization and manufacturing of high performance (low power, high throughput) integrated circuits in contemporary CMOS and emerging technologies. Suited with industrial design tools for integrated circuits, simulation tools and measurement beds, the VLSI group is involved with digital and mixed-signal circuit design to verify the functionality of the discovered novel circuit and physical design principles. The Drexel VLSI laboratory develops design methodologies and automation tools in these areas, particularly in novel clocking techniques, featuring resonant clocking, and interconnects, featuring wireless interconnects.

Drexel Wireless Systems Laboratory

The Drexel Wireless Systems Laboratory (DWSL) contains an extensive suite of equipment for constructing, debugging, and testing prototype wireless communications systems. Major equipment within DWSL includes:

- three software defined radio network testbeds (HYDRA, USRP, and WARP) for rapidly prototyping radio, optical and ultrasonic communications systems,
- a TDK RF anechoic chamber and EMSCAN desktop antenna pattern measurement system,
- a materials printer and printed circuit board milling machine for fabricating conformal antennas and
- wireless protocol conformance testing equipment from Aeroflex.

The lab is also equipped with network analyzers, high speed signal generators, oscilloscopes, and spectrum analyzers as well as several Zigbee development platforms for rapidly prototyping sensor networks.

DWSL personnel also collaborate to create wearable, fabric based transceivers through collaboration with the Shima Seiki Haute Laboratory in the Drexel ExCITe Center.The knitting equipment at Drexel includes sixteen SDS-ONE APEX3 workstations and four state-of-the-art knitting machines. The workstations accurately simulate fabric construction and provide researchers and designers the opportunity to program, create and simulate textile prototypes, import CAD specifications of final products, and produce made-to-measure or mass-produced pieces on Shima Seiki knitting machines.For testing smart textiles for biomedical, DWSL personnel also have collaborators in the Center for Interdisciplinary

Clinical Simulation and Practice (CICSP) in the Drexel College of Medicine which provides access to medical mannequin simulators.

Ecological and Evolutionary Signal-processing and Informatics Laboratory

The Ecological and Evolutionary Signal-processing and Informatics Laboratory (EESI) seeks to solve problems in high-throughput genomics and engineer better solutions for biochemical applications. The lab's primary thrust is to enhance the use of high-throughput DNA sequencing technologies with pattern recognition and signal processing techniques. Applications include assessing the organism content of an environmental sample, recognizing/classifying potential and functional genes, inferring environmental factors and inter-species relationships, and inferring microbial evolutionary relationships from short-read DNA/RNA fragments. The lab also investigates higher-level biological systems such as modeling and controlling chemotaxis, the movement of cells.

Electric Power Engineering Center

This newly established facility makes possible state-of-the-art research in a wide variety of areas, ranging from detailed theoretical model study to experimental investigation in its high voltage laboratories. The mission is to advance and apply scientific and engineering knowledge associated with the generation, transmission, distribution, use, and conservation of electric power. In pursuing these goals, this center works with electric utilities, state and federal agencies, private industries, nonprofit organizations and other universities on a wide spectrum of projects. Research efforts, both theoretical and experimental, focus on the solution of those problems currently faced by the electric power industry. Advanced concepts for electric power generation are also under investigation to ensure that electric power needs will be met at the present and in the future.

Electronic Design Automation Facility

Industrial-grade electronic design automation software suite and integrated design environment for digital, analog and mixed-signal systems development. Field Programmable Gate Array (FPGA) development hardware. Most up-to-date FPGA/embedded system development hardware kits. Printed circuit board production facility. Also see Drexel VLSI Laboratory.

Microwave-Photonics Device Laboratories

The laboratory is equipped with test and measurement equipment for high-speed analog and digital electronics and fiber optic systems. The test equipment includes network analyzers from Agilent (100kHz- 1.3 GHz and 45 Mhz-40 GHz), and Anritsu (45 MHz-6 GHz); spectrum analyzers from Tektronix, HP, and Agilent with measurement capability of DC to 40 GHz and up to 90 GHz using external mixers; signal generators and communication channel modulators from HP, Rhode-Schwartz, Systron Donner, and Agilent; microwave power meter and sensor heads, assortment of passive and active microwave components up to 40 GHz ; data pattern generator and BER tester up to 3Gb/s; optical spectrum analyzer from Anritsu and power meters from HP; single and multimode fiber optic based optical transmitter and receiver boards covering ITU channels at data rates up to 10Gb/s; passive optical components such as isolator, filter, couplers, optical connectors and fusion splicer; LPKF milling machine for fabrication of printed circuit boards; wire-bonding and Cascade probe stations; Intercontinental test fixtures for testing of MMIC circuits and solid-state transistors; state-of-the-art microwave and

electromagnetic CAD packages such as Agilent ADS, ANSYS HFSS, and COMSOL multi-physics module.

Music and Entertainment Technology Laboratory

The Music and Entertainment Technology Laboratory (MET-lab) is devoted to research in digital media technologies that will shape the future of entertainment, especially in the areas of sound and music. We employ digital signal processing and machine learning to pursue novel applications in music information retrieval, music production and processing technology, and new music interfaces. The MET-lab is also heavily involved in outreach programs for K-12 students and hosts the Summer Music Technology program, a one-week learning experience for high school students. Lab facilities include a sound isolation booth for audio and music recording, a digital audio workstation running ProTools, two large multi-touch display interfaces of our own design, and a small computing cluster for distributed processing.

NanoPhotonics Laboratory

Our research is primarily in the area of nanophotonics with a focus on the nanoscale interaction of light with matter. Interests include: liquid crystal/polymer composites for gratings, lenses and HOEs; liquid crystal interactions with surfaces and in confined nanospaces; alternative energy generation through novel photon interactions; ink-jet printed conducting materials for RF and photonic applications; and the creation and development of smart textiles technologies including soft interconnects, sensors, and wireless implementations.

Opto-Electro-Mechanical Laboratory

This lab concentrates on the system integration on optics, electronics, and mechanical components and systems, for applications in imaging, communication, and biomedical research. Research areas include: Programmable Imaging with Optical Micro-electrical-mechanical systems (MEMS), in which microscopic mirrors are used to image light into a single photodetector; Pre-Cancerous Detection using White Light Spectroscopy, which performs a cellular size analysis of nuclei in tissue; Free-space Optical Communication using Space Time Coding, which consists of diffused light for computer-to-computer communications, and also tiny lasers and detectors for chip-to-chip communication; Magnetic Particle Locomotion, which showed that particles could swim in a uniform field; and Transparent Antennas using Polymer, which enables antennas to be printed through an ink-jet printer.

Plasma and Magnetics Laboratory

Research is focused on applications of electrical and magnetic technologies to biology and medicine. This includes the subjects of non-thermal atmospheric pressure plasma for medicine, magnetic manipulation of particles for drug delivery and bio-separation, development of miniature NMR sensors for cellular imaging and carbon nanotube cellular probes.

Power Electronics Research Laboratory

The Power Electronics Research Laboratory (PERL) is involved in circuit and design simulation, device modeling and simulation, and experimental testing and fabrication of power electronic circuits. The research and development activities include electrical terminations, power quality, solar photovoltaic systems, GTO modeling, protection and relay coordination, and solid-state circuit breakers. The analysis tools include EMPT, SPICE, and others, which have been modified to incorporate models of such controllable solid-state switches as SCRs, GTOs, and MOSFETs. These programs have a wide variety and range of modeling capabilities used

to model electromagnetics and electromechanical transients ranging from microseconds to seconds in duration. The PERL is a fully equipped laboratory with 42 kVA AC and 70 kVA DC power sources and data acquisition systems, which have the ability to display and store data for detailed analysis. Some of the equipment available is a distribution and HV transformer and three phase rectifiers for power sources and digital oscilloscopes for data measuring and experimental analysis. Some of the recent studies performed by the PERL include static VAR compensators, power quality of motor controllers, solid-state circuit breakers, and power device modeling which have been supported by PECO, GE, Gould, and EPRI.

Testbed for Power-Performance Management of Enterprise Computing Systems

This computing testbed is used to validate techniques and algorithms aimed at managing the performance and power consumption of enterprise computing systems. The testbed comprises a rack of Dell 2950 and Dell 1950 PowerEdge servers, as well as assorted desktop machines, networked via a gigabit switch. Virtualization of this cluster is enabled by VMWare's ESX Server running the Linux RedHat kernel. It also comprises of a rack of ten Apple Xserve machines networked via a gigabit switch. These servers run the OS X Leopard operating systems and have access to a RAID with TBs of total disk capacity.

Electrical Engineering Faculty

Tom Chmielewski, PhD *(Drexel University)*. Teaching Professor. Modeling and simulation of electro-mechanical systems; optimal, adaptive and non-linear control; DC motor control; system identification; kalman filters (smoothing algorithms, tracking); image processing; robot design; biometric technology and design of embedded systems for control applications utilizing MATLAB and SIMULINK

Fernand Cohen, PhD *(Brown University)*. Professor. Surface modeling; tissue characterization and modeling; face modeling; recognition and tracking.

Andrew Cohen, PhD *(Rensselaer Polytechnic Institute)*. Associate Professor. Image processing; multi-target tracking; statistical pattern recognition and machine learning; algorithmic information theory; 5-D visualization

Kapil Dandekar, PhD *(University of Texas-Austin) Director of the Drexel Wireless Systems Laboratory (DWSL); Associate Dean of Research, College of Engineering*. Professor. Cellular/mobile communications and wireless LAN; smart antenna/MIMO for wireless communications; applied computational electromagnetics; microwave antenna and receiver development; free space optical communication; ultrasonic communication; sensor networks for homeland security; ultrawideband communication.

Afshin Daryoush, ScD *(Drexel University)*. Professor. Digital and microwave photonics; nonlinear microwave circuits; RFIC; medical imaging.

Anup Das, PhD *(Universit of Singapore)*. Assistant Professor. Design of algorithms for neuromorphic computing, particularly using spiking neural networks, dataflow-based design of neuromorphic computing system, design of scalable computing system; hardware-software co-design and management, and thermal and power management of many-core embedded systems

Bruce A. Eisenstein, PhD *(University of Pennsylvania)*. Arthur J. Rowland Professor of Electrical and Computer Engineering. Pattern recognition; estimation; decision theory.

Adam K. Fontecchio, PhD *(Brown University) Director, Center for the Advancement of STEM Teaching and Learning Excellence (CASTLE).* Professor. Electro-optics; remote sensing; active optical elements; liquid crystal devices.

Gary Friedman, PhD *(University of Maryland-College Park) Associate Department Head for Graduate Affairs.* Professor. Biological and biomedical applications of nanoscale magnetic systems.

Allon Guez, PhD *(University of Florida)*. Professor. Intelligent control systems; robotics, biomedical, automation and manufacturing; business systems engineering.

Leonid Hrebien, PhD *(Drexel University)*. Professor. Tissue excitability; acceleration effects on physiology; bioinformatics.

Nagarajan Kandasamy, PhD *(University of Michigan) Associate Department Head for Undergraduate Affairs.* Associate Professor. Embedded systems, self-managing systems, reliable and fault-tolerant computing, distributed systems, computer architecture, and testing and verification of digital systems.

Youngmoo Kim, PhD *(MIT) Director, Expressive and Creative Interactive Technologies (ExCITe) Center.* Professor. Audio and music signal processing, voice analysis and synthesis, music information retrieval, machine learning.

Fei Lu, PhD *(University of Michigan)*. Assistant Professor. Power electronics; wireless power transfer technology for the high-power electric vehicles and the low-power electronic devices.

Karen Miu, PhD *(Cornell University)*. Professor. Power systems; distribution networks; distribution automation; optimization; system analysis.

Bahram Nabet, PhD *(University of Washington)*. Professor. Optoelectronics; fabrication and modeling; fiber optic devices; nanoelectronics; nanowires.

Prawat Nagvajara, PhD *(Boston University)*. Associate Professor. System on a chip; embedded systems; power grid computation; testing of computer hardware; fault-tolerant computing; VLSI systems; error control coding.

Dagmar Niebur, PhD *(Swiss Federal Institute of Technology)*. Associate Professor. Intelligent systems; dynamical systems; power system monitoring and control.

Christopher Peters, PhD *(University of Michigan)*. Teaching Professor. Nuclear reactor design; ionizing radiation detection; nuclear forensics; power plant reliability and risk analysis; naval/marine power and propulsion; directed energy/high power microwaves; nonstationary signal processing; radar; electronic survivability/susceptibility to harsh environments; electronic warfare

Gail L. Rosen, PhD *(Georgia Institute of Technology)*. Associate Professor. Signal processing, signal processing for biological analysis and modeling, bio-inspired designs, source localization and tracking.

Ioannis Savidis, PhD *(University of Rochester)*. Associate Professor. Analysis, modeling, and design methodologies for high performance digital and mixed-signal integrated circuits; Emerging integrated circuit technologies; Electrical and thermal modeling and characterization, signal and power integrity, and power and clock delivery for 3-D IC technologies

Kevin J. Scoles, PhD *(Dartmouth College) Associate Dean for Undergraduate Affairs.* Associate Professor. Microelectronics; electric vehicles; solar energy; biomedical electronics.

Harish Sethu, PhD *(Lehigh University)*. Associate Professor. Protocols, architectures and algorithms in computer networks; computer security; mobile ad hoc networks; large-scale complex adaptive networks and systems.

James Shackleford, PhD *(Drexel University)*. Associate Professor. Medical image processing, high performance computing, embedded systems, computer vision, machine learning

P. Mohana Shankar, PhD *(Indian Institute of Technology) Allen Rothwarf Professor of Electrical and Computer Engineering.* Professor. Wireless communications; biomedical ultrasonics; fiberoptic bio-sensors.

Jonathan E. Spanier, PhD *(Columbia University) Department Head, Mechanical Engineering and Mechanics.* Professor. Light-matter interactions in electronic materials, including ferroelectric semiconductors, complex oxide thin film science; laser spectroscopy, including Raman scattering.

Matthew Stamm, PhD *(University of Maryland, College Park)*. Associate Professor. Information Security; multimedia forensics and anti-forensics; information verification; adversarial dynamics; signal processing

Baris Taskin, PhD *(University of Pittsburgh)*. Professor. Very large-scal integration (VLSI) systems, computer architecture, circuits and systems, electronic design automation (EDA), energy efficient computing.

John Walsh, PhD *(Cornell University)*. Associate Professor. Bounding the region of entropic vectors and its implications for the limits of communication networks, big data distributed storage systems, and graphical model based machine learning; efficient computation and analysis of rate regions for network coding and distributed storage; code construction, polyhedral computation, hierarchy, and symmetry

Steven Weber, PhD *(University of Texas-Austin) Department Head.* Professor. Mathematical modeling of computer and communication networks, specifically streaming multimedia and ad hoc networks.

Jaudelice de Oliveira, PhD *(Georgia Institute of Technology)*. Associate Professor. Software-defined networking; social and economic networks; network security; design and analysis of protocols, algorithms and architectures in computer networks, particularly solutions for the Internet of Things

Emeritus Faculty

Eli Fromm, PhD *(Jefferson Medical College)*. Professor Emeritus. Engineering education; academic research policy; bioinstrumentation; physiologic systems.

Edwin L. Gerber, PhD *(University of Pennsylvania)*. Professor Emeritus. Computerized instruments and measurements; undergraduate engineering education.

Engineering

Major: Engineering
Degree Awarded: Bachelor of Science in Engineering (BSE)

Calendar Type: Quarter
Total Credit Hours: 180.5
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional (CIP) code: 14.0101
Standard Occupational Classification (SOC) code: 17-2199

About the Program

The Bachelor of Science in Engineering major is an interdisciplinary engineering major for students who do not intend to be practicing engineers. Students in the Bachelor of Science in Engineering major combine a rigorous engineering education in the College of Engineering with interdisciplinary studies in fields outside of engineering such as law, medicine, business, entrepreneurship, teaching, international studies, public policy, music, art, environmental studies, and more. The Bachelor of Science in Engineering major provides a strong grounding in the foundations of engineering, in quantitative skills, and in the analytic processes that engineers use in design of practical technology.

Drexel's Bachelor of Science in Engineering major was developed to provide students with educational and professional challenges not available in the traditional engineering curriculum.

Program Objectives

The key objectives of the Bachelor of Science in Engineering program are to provide the student with:

- a strong foundation in science and mathematics
- a foundation of the fundamentals of engineering as a discipline
- a strong grounding in a second cognate area (either technical, pre-professional, cultural, global, or another area worked out between the student and his/her advisor)
- an integrating experience that ties the technical and the cognate areas together. Examples of such experiences may be, but are not limited to, research projects, capstone designs, a public service assignment, etc.

Additional Information

Additional information about the Bachelor of Science in Engineering program is available on the Bachelor of Science in Engineering website. (https://drexel.edu/engineering/academics/areas-of-study-programs/engineering/bs/)

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education/Liberal Studies Requirements

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV E101	The Drexel Experience	1.0
General Education Requirements [*]		24.0

Free Electives	24.0
Math and Science Requirements	
BIO 141	Essential Biology	4.5
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 200	Multivariate Calculus	4.0
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
PHYS 201	Fundamentals of Physics III	4.0
Core Curriculum Requirements	
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
ENGR 113	First-Year Engineering Design	3.0
ENGR 131	Introductory Programming for Engineers	3.0
or ENGR 132	Programming for Engineers	
ENGR 231	Linear Engineering Systems	3.0
ENGR 232	Dynamic Engineering Systems	3.0
Engineering Requirements	
Senior Design Sequence or Research Project		8.0
200+ Level Courses [**]		22.0
300+ Level Courses [**]		22.0
Technical Electives	
200+ Level Courses [***]		18.0
Total Credits		180.5

[*] General Education Requirements. (p. 215)

[**] Students may choose between AE, BMES, CHE, CAE, CS, ECE, ENGR, ENVE, MATE or MEM.

[***] Students may choose between BMES, CS, MATH, CHEM, PHYS, BIO or approved College of Engineering courses. Advisor approval is required for technical electives.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

5 YR UG Co-op Concentration

Term 1		Credits
CHEM 101	General Chemistry I	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
MATH 121	Calculus I	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	14.5
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
CHEM 102	General Chemistry II	4.5
ENGR 131 or 132	Introductory Programming for Engineers Programming for Engineers	3.0
MATH 122	Calculus II	4.0
PHYS 101	Fundamentals of Physics I	4.0
	Term Credits	16.5
Term 3		
BIO 141	Essential Biology	4.5
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0

ENGR 113	First-Year Engineering Design	3.0
MATH 200	Multivariate Calculus	4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	18.5
Term 4		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
ENGR 231	Linear Engineering Systems	3.0
PHYS 201	Fundamentals of Physics III	4.0
Two Engineering courses[*]		7.0
	Term Credits	17.0
Term 5		
ENGR 232	Dynamic Engineering Systems	3.0
Two Engineering courses[*]		7.0
General Education elective[*]		3.0
Free elective		3.0
	Term Credits	16.0
Term 6		
Two Engineering courses[*]		6.0
General Education elective[*]		3.0
Free elective		3.0
	Term Credits	12.0
Term 7		
Two Engineering courses[*]		6.0
Technical elective		3.0
General Education elective[*]		3.0
Free elective		3.0
	Term Credits	15.0
Term 8		
Two Engineering courses[*]		6.0
Technical elective		3.0
General Education elective[*]		3.0
Free elective		3.0
	Term Credits	15.0
Term 9		
Two Engineering courses[*]		6.0
Technical elective		3.0
General Education elective[*]		3.0
Free elective		3.0
	Term Credits	15.0
Term 10		
Senior Design Project I or Capstone course[*]		2.0
Engineering course[*]		3.0
Technical elective		3.0
General Education elective[*]		3.0
Free elective		3.0
	Term Credits	14.0
Term 11		
Senior Design Project II or Capstone course[*]		2.0
Engineering course[*]		3.0
Technical elective		3.0
General Education elective[*]		3.0
Free elective		3.0
	Term Credits	14.0
Term 12		
Senior Design Project III or Capstone course[*]		4.0
Technical elective		3.0
General Education elective[*]		3.0
Free elective		3.0
	Term Credits	13.0

Total Credit: 180.5

[*]   See degree requirements (p. 249).

Facilities

From the start of their freshman year, students learn to use the equipment they are likely to need in their careers, such as oscilloscopes, signal generators, amplifiers, and power supplies. These skills make students more useful as co-op employees and give them a competitive advantage in their engineering careers.

Computer/Design Center

The Drexel Curriculum boasts two types of lab experience: Instrumentation and Computer Design. Instrumentation Labs introduce Engineering Majors to the sight, sound, and feel of equipment such as digital multimeters, power supplies, oscilloscopes, and waveform generators. The Computer Labs imbue these pre-engineers with knowledge of software which will be vital in today's work environment.

Engineering Technology

Major: Engineering Technology
Degree Awarded: Bachelor of Science in Engineering Technology (BSET)
Calendar Type: Quarter
Total Credit Hours: 185.5
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional (CIP) code: 15.0401; 15.9999; 15.1299; 15.0699; 15.0805
Standard Occupational Classification (SOC) code: 17-3029; 17-3027

About the Program

The degree is *Engineering Technology*, the career is *Engineering.*™

The BS in Engineering Technology program at Drexel University is organized around a practice-based learning, with extensive use of hands-on laboratory exercises in a majority of the classes. Due to its application-oriented focus, the program is suited for students who learn best by seeing concepts put into practice, "learn by doing" and plan to pursue careers in a variety of design-, production-, and service-related positions. In addition, the program teaches how the different engineering fields work together as a system.

Engineering Technology is a branch of engineering that emphasizes practice and the application of theory to solve real-world problems. Although the subject areas of core courses in both engineering technology and traditional engineering are similar, engineering technology courses stress the application of engineering techniques, while traditional engineering courses focus on the development of concepts.

Engineering Technology graduates integrate electrical, mechanical, and industrial engineering disciplines to solve problems and meet opportunities and technical challenges in healthcare, energy, transportation, communications, environmental protection, defense and homeland security, and buildings and infrastructure.

The state-of-the-art technology at the heart of the practice-based laboratories, allows graduates to be well versed in the application of modern technology to production-level engineering problems. Through real world industry-sponsored capstone projects, internships with local and international companies, students in the Engineering Technology

program frequently become closely connected to the regional industry and often end up employed with those local industries.

The following concentrations are available under the Engineering Technology degree:

- Computer Engineering Technology (p. 252)
- Electrical Engineering Technology (p. 254)
- Healthcare Engineering Technology (p. 256)
- Industrial Engineering Technology (p. 257)
- Mechanical and Manufacturing Engineering Technology (p. 259)

All students enrolled in the program are required to take general education courses, including mathematics, sciences and general education electives. All concentrations consist of core fundamental courses, technical electives, free electives, and a three-term senior design project, reflecting industrial practices. During pre-junior year, students need to choose one of the five available concentrations.

Full-time students can opt for a four-year program with a six-month co-op or a five-year program with three six-month co-op cycles.

Engineering technology graduates are uniquely qualified to serve in a variety of functions requiring traditional and nontraditional technological skills. The program also prepares students for graduate study in a variety of fields, including engineering technology, engineering management, business administration, and health-care.

Mission

The mission of the Engineering Technology program is to provide contemporary students with an academic foundation and practical education in engineering technology through an outstanding curriculum and applied research program, and the participation of our students in one of the nation's most successful cooperative educational programs.

Engineering Technology Program Educational Objectives

Produces Graduates who:

- Apply discipline-specific theory, experiments and real-world experience to interpret, analyze and solve current and emerging technical problems.
- Communicate clearly and persuasively with technical and non-technical people in oral, written and graphical forms.
- Function individually or a member of a team, or as a leader on teams to design quality systems, components or processes in a timely, responsible and creative manner.
- Demonstrate behavior consistent with professional ethics and are cognizant of social concerns as they relate to the practice of engineering technology.
- Strive for professional growth and engage in lifelong learning.

Engineering Technology Student Outcomes

The program's outcomes reflect the skills and abilities that the curriculum is designed to provide to students by the time they graduate. These are:

- an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly defined engineering problems appropriate to the discipline;

- an ability to design systems, components, or processes meeting specified needs for broadly defined engineering problems appropriate to the discipline;
- an ability to apply written, oral, and graphical communication in broadly defined technical and non-technical environments, and an ability to identify and use appropriate technical literature;
- an ability to conduct standard tests, measurements, and experiments to analyze and interpret the results to improve processes; and
- An ability to function effectively as a member or leader on a technical team.

Additional Information

The Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of ABET. (http://www.abet.org)

For additional information, please contact Gerry Willis at gtm23@drexel.edu or 215-895-6253 or visit the Engineering Technology (https://drexel.edu/engineering/academics/departments/engineering-technology/) web page.

Career Opportunities

The Engineering Technology program is designed to meet employers' growing needs for college-educated problem-solvers, created by the technology revolution. Career opportunities in engineering technology are virtually limitless with at least 5,500 companies in the region offering jobs for engineering technologists. As a leading urban university in the Greater Philadelphia region, Drexel's location offers access to a vast number of industries including:

- Defense
- Aerospace
- Power generation
- Public utilities
- Shipbuilding
- Railroad
- Manufacturing
- Environmental
- Chemical
- Pharmaceutical
- Medical care

With the skills developed in this program, students will be able to integrate academic theory and professional practice in order to communicate effectively with engineers from different fields, scientists, the production workforce, marketing professionals, company management, and ultimately the customer. Students may participate in the design, development, testing, and manufacturing of industrial machinery, electric and electronic equipment, medical devices, consumer products, and other equipment.

Engineering technologists can serve in industry in many capacities; some fields include:

- Automation design and process engineering
- Mechanical/production engineering
- Electrical engineering and electronics
- Field engineering
- Systems engineering and management
- Environmental engineering

- Quality control
- Sales and customer service
- Systems/programming
- Testing engineering

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on post-graduate opportunities.

Engineering Technology Faculty

M. Eric Carr, MsCpE *(Drexel University)*. Instructor. Computer Engineering, Digital Design, Programmable Devices, Genetic Algorithms, Programming, Additive Manufacturing, Maker Movement.

Richard Chiou, PhD *(Georgia Institute of Technology)*. Associate Professor. Green manufacturing, mechatronics, Internet-based robotics and automation, and remote sensors and monitoring.

Yalcin Ertekin, PhD *(University of Missouri-Rolla)*. Associate Clinical Professor. High speed machining with micromachining applications, machining process optimization and condition monitoring using multiple sensors, FEA simulation with 3D solid modeling applications, rapid prototyping and reverse engineering, quality and reliability improvement through statistically designed experiments, neural networks and data mining and Taguchi methods, CNC machine tool calibration characterization of cold fastening, clinching and self-pierced riveting processes, non-invasive surgical tool design, student learning enhancement using online simulation tools.

Vladimir Genis, PhD *(Kiev State University, Ukraine) Department Head, Engineering Technology*. Professor. Ultrasound wave propagation and scattering, ultrasound imaging, electronic instrumentation, piezoelectric transducers, and engineering education. Designed and developed diagnostic and therapeutic equipment for medical applications and electronic systems and techniques for defense-related and industrial applications.

Irina Ciobanescu Husanu, PhD *(Drexel University)*. Assistant Clinical Professor. Microgravity combustion, thermal-fluid science with applications in micro-combustion, fuel cells and research of alternative and green fuels, energy conversion and renewable energy, industrial experience in aerospace engineering areas (theoretical analysis, numerical simulations and experimental investigations), design and testing of propulsion systems, mechanical instrumentation, and developing industrial applications of aircraft engines.

Lunal Khuon, PhD *(Massachusetts Institute of Technology)*. Clinical Associate Professor. Radio frequency, analog, and biomedical integrated circuits, biomedical instrumentation, neural interfaces, wireless systems, and engineering education. Research topics include area-efficient and power-efficient integrated circuits, plasmonics, adiabatic circuits, rotary clocks, and medical cyber-physical systems.

Michael Mauk, PhD, PE *(University of Delaware)*. Assistant Clinical Professor. Rapid prototyping, microfluidics, alternative energy including solar energy and photovoltaics, semiconductor materials science, nanotechnology.

Engineering Technology

Computer Engineering Technology Concentration

Effective March 15, 2020, new students are no longer being accepted into this concentration, however similar options are available. Contact Gerry Willis at gtm23@drexel.edu **or 215-895-6253 for additional information.**

The Computer Engineering Technology Concentration provides in-depth knowledge of hardware and software design, development, and maintenance. Through our solid, laboratory-centric curriculum, students gain a strong background in software and hardware development with programming languages and HDLs currently used in industry. In addition, students learn state-of-the-art techniques for developing robust technological solutions, including network- and web-based applications and Internet of Things (IoT) considerations.

The focus of the curriculum is on embedded systems design and development. From low-level gate-based design to the use of high-end microprocessors and current bus standards, students gain a thorough architectural understanding of computer systems. The curriculum includes in-depth design and analysis of combinational logic, sequential logic and state machines, microcontroller systems, microprocessor systems, and state-of-the-art computer technology.

Additional Information

For more information on the Technology minor, please contact Gerry Willis at gtm23@drexel.edu or 215-895-6253.

Computer Engineering Technology Concentration Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements		
COM 230	Techniques of Speaking	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
HIST 285	Technology in Historical Perspective	4.0
PHIL 315	Engineering Ethics	3.0
General Educational Electives		10.0
Basic Science Requirements		
CHEM 101	General Chemistry I	3.5
PHYS 152	Introductory Physics I	4.0
PHYS 153	Introductory Physics II	4.0
PHYS 154	Introductory Physics III	4.0
Mathematics Requirements		
MATH 110	Precalculus	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
STAT 201	Introduction to Business Statistics	4.0
Computer Technology Core		

EET 102	Introduction to Engineering Technology	3.0
EET 201	Circuit Analysis I	4.0
EET 202	Circuit Analysis II	4.0
EET 205	Digital Electronics	4.0
EET 206	Analog Electronics I	4.0
EET 208	Introduction to Programming for Embedded Systems	3.0
EET 209	Fundamentals of Virtual Instrumentation	3.0
EET 319	PLC Fundamentals	4.0
EET 325	Microprocessors	3.0
EET 401	Applied Microcontrollers	4.0
INDE 240	Technology Economics	3.0
INDE 370	Industrial Project Management	3.0
MET 100	Graphical Communication	3.0
Computer Technology Concentration Requirements		
CET 201	Microcomputer Hardware	3.0
CET 301	Advanced Digital Electronics	4.0
CET 303	Computer Architecture with Verilog HDL	4.0
CET 401	Real-Time Operating Systems	4.0
CET 402	Applied Embedded Systems	4.0
CET 403	Computer Networking Technologies	4.0
CET 405	Electronic Device Design	4.0
CS 171	Computer Programming I	3.0
CS 172	Computer Programming II	3.0
CS 260	Data Structures	3.0
CS 265	Advanced Programming Tools and Techniques	3.0
CT 201	Information Technology Security I	3.0
ECEC 204	Design with Microcontrollers	3.0
ECEC 302	Digital Systems Projects	3.0
INFO 151	Web Systems and Services I	3.0
INFO 152	Web Systems and Services II	3.0
CET Technical Electives		6.0
Capstone Course Requirements		
CET 421	Senior Design Project I	3.0
CET 422	Senior Design Project II	3.0
CET 423	Senior Design Project III	3.0
Miscellaneous		
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
UNIV E101	The Drexel Experience	1.0
Free Electives		10.0
Total Credits		185.5

Computer Engineering Technology Concentration Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
CHEM 101	General Chemistry I	3.5
EET 102	Introduction to Engineering Technology	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 110	Precalculus	3.0
PHYS 152	Introductory Physics I	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	17.5
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
EET 208	Introduction to Programming for Embedded Systems	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 121	Calculus I	4.0
MET 100	Graphical Communication	3.0
PHYS 153	Introductory Physics II	4.0
	Term Credits	18.0
Term 3		
COOP 101	Career Management and Professional Development	0.0
CET 201	Microcomputer Hardware	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
EET 209	Fundamentals of Virtual Instrumentation	3.0
MATH 122	Calculus II	4.0
PHYS 154	Introductory Physics III	4.0
	Term Credits	17.0
Term 4		
CS 171	Computer Programming I	3.0
EET 201	Circuit Analysis I	4.0
HIST 285	Technology in Historical Perspective	4.0
STAT 201	Introduction to Business Statistics	4.0
	Term Credits	15.0
Term 5		
CS 172	Computer Programming II	3.0
CT 201	Information Technology Security I	3.0
EET 202	Circuit Analysis II	4.0
EET 205	Digital Electronics	4.0
INFO 151	Web Systems and Services I	3.0
	Term Credits	17.0
Term 6		
COM 230	Techniques of Speaking	3.0
ECEC 302	Digital Systems Projects	3.0
EET 206	Analog Electronics I	4.0
EET 319	PLC Fundamentals	4.0
General Educational Elective		3.0
	Term Credits	17.0
Term 7		
CET 301	Advanced Digital Electronics	4.0
EET 401	Applied Microcontrollers	4.0
INDE 370	Industrial Project Management	3.0
INFO 152	Web Systems and Services II	3.0
PHIL 315	Engineering Ethics	3.0
	Term Credits	17.0
Term 8		
CET 401	Real-Time Operating Systems	4.0
CET 402	Applied Embedded Systems	4.0
CS 265	Advanced Programming Tools and Techniques	3.0
ECEC 204	Design with Microcontrollers	3.0
	Term Credits	14.0
Term 9		
CS 260	Data Structures	3.0
CET 303	Computer Architecture with Verilog HDL	4.0
CET 403	Computer Networking Technologies	4.0
INDE 240	Technology Economics	3.0
	Term Credits	14.0
Term 10		
CET 405	Electronic Device Design	4.0
CET 421	Senior Design Project I	3.0
Free electives		3.0
General Education elective		4.0
	Term Credits	14.0
Term 11		

CET 422	Senior Design Project II	3.0
Technical Elective		3.0
Free elective		3.0
General Education elective		3.0
	Term Credits	12.0
Term 12		
CET 423	Senior Design Project III	3.0
EET 325	Microprocessors	3.0
Technical elective		3.0
Free elective		4.0
	Term Credits	13.0

Total Credit: 185.5

Engineering Technology

Electrical Engineering Technology Concentration

The Electrical Engineering Technology (EET) concentration prepares graduates who are able to design, develop, test, or supervise the manufacturing and installation of electrical and electronic equipment, components, or systems for commercial, industrial, military, or scientific use. The EET graduates are problem solvers that can work through technical challenges and present pragmatic solutions.

The EET concentration provides an extensive background in electric circuit analysis and electronics. Students are required to study digital and analog electronics, digital computer design, analysis of electric power systems, and renewable energy.

During the first three years, students of all concentrations in engineering technology take electrical, mechanical, and industrial courses to get a solid, systematic background in different engineering fields. Students are required to complete general and concentration engineering technology courses, technical electives, and free elective courses that permit students great latitude in tailoring the program of study to match their career goals.

Additional Information

For more information, please contact Gerry Willis at gtm23@drexel.edu or 215-895-6253.

Electrical Engineering Technology Concentration

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Degree Requirements

Humanites and Social Sciences Requirements

COM 230	Techniques of Speaking	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
HIST 285	Technology in Historical Perspective	4.0
PHIL 315	Engineering Ethics	3.0
General Educational Ellectives		9.0
Basic Science Requirements		
CHEM 101	General Chemistry I	3.5
PHYS 152	Introductory Physics I	4.0
PHYS 153	Introductory Physics II	4.0
PHYS 154	Introductory Physics III	4.0
Mathematics Requirements		
MATH 110	Precalculus	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
STAT 201	Introduction to Business Statistics	4.0
Engineering Technology Core		
EET 102	Introduction to Engineering Technology	3.0
EET 201	Circuit Analysis I	4.0
EET 202	Circuit Analysis II	4.0
EET 204	Introduction to Nanotechnology	3.0
EET 205	Digital Electronics	4.0
EET 208	Introduction to Programming for Embedded Systems	3.0
EET 209	Fundamentals of Virtual Instrumentation	3.0
EET 311	Modeling of Engineering Systems	4.0
EET 319	PLC Fundamentals	4.0
EET 320	Renewable Energy Systems	3.0
EET 333 [WI]	Non-Destructive Evaluation of Materials	4.0
EET 401	Applied Microcontrollers	4.0
INDE 240	Technology Economics	3.0
INDE 370	Industrial Project Management	3.0
MET 100	Graphical Communication	3.0
MET 101	Engineering Materials	3.0
MET 204	Applied Quality Control	3.0
MET 205	Robotics and Mechatronics	3.0
MET 209	Fluid Power	4.0
MET 213	Applied Mechanics	4.0
MHT 205	Thermodynamics I	3.0
MHT 226	Measurement Techniques and Instrumentation	3.0
Electrical Engineering Technology Concentration Requirements		
EET 206	Analog Electronics I	4.0
EET 313	Signals and Systems I	4.0
EET 317	Analog Electronics II	4.0
EET 322	Energy Conversion	4.0
EET 323	Electrical Systems Design	3.0
EET 324	Power Electronics	4.0
EET 325	Microprocessors	3.0
Electrical Engineering Technology (EET) Electives		**6.0**

Select 6.0 additional credits from any BET, EET, MET, MHT or INDE courses not already required. See advisor for specific courses.

Capstone Course Requirements		
MET 421 [WI]	Senior Design Project I	3.0
MET 422	Senior Design Project II	3.0
MET 423 [WI]	Senior Design Project III	3.0
Miscellaneous		
COOP 101	Career Management and Professional Development	0.0
CIVC 101	Introduction to Civic Engagement	1.0
UNIV E101	The Drexel Experience	1.0
Free electives		9.0
Total Credits		185.5

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are

advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Electrical Engineering Technology Concentration

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Sample Plan of Study

5 YR UG Co-op

Term 1		Credits
CHEM 101	General Chemistry I	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
EET 102	Introduction to Engineering Technology	3.0
MATH 110	Precalculus	3.0
PHYS 152	Introductory Physics I	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	17.5
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
EET 208	Introduction to Programming for Embedded Systems	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 121	Calculus I	4.0
MET 100	Graphical Communication	3.0
PHYS 153	Introductory Physics II	4.0
	Term Credits	18.0
Term 3		
COOP 101	Career Management and Professional Development	0.0
EET 209	Fundamentals of Virtual Instrumentation	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 122	Calculus II	4.0
MET 101	Engineering Materials	3.0
PHYS 154	Introductory Physics III	4.0
	Term Credits	17.0
Term 4		
EET 201	Circuit Analysis I	4.0
EET 333 [WI]	Non-Destructive Evaluation of Materials	4.0
MET 209	Fluid Power	4.0

STAT 201	Introduction to Business Statistics	4.0
	Term Credits	16.0
Term 5		
EET 202	Circuit Analysis II	4.0
EET 204	Introduction to Nanotechnology	3.0
EET 205	Digital Electronics	4.0
MET 205	Robotics and Mechatronics	3.0
MHT 205	Thermodynamics I	3.0
	Term Credits	17.0
Term 6		
COM 230	Techniques of Speaking	3.0
EET 311	Modeling of Engineering Systems	4.0
EET 319	PLC Fundamentals	4.0
MET 213	Applied Mechanics	4.0
	Term Credits	15.0
Term 7		
EET 320	Renewable Energy Systems	3.0
EET 401	Applied Microcontrollers	4.0
INDE 240	Technology Economics	3.0
MET 204	Applied Quality Control	3.0
MHT 226	Measurement Techniques and Instrumentation	3.0
	Term Credits	16.0
Term 8		
EET 206	Analog Electronics I	4.0
EET 322	Energy Conversion	4.0
EET 324	Power Electronics	4.0
PHIL 315	Engineering Ethics	3.0
	Term Credits	15.0
Term 9		
EET 313	Signals and Systems I	4.0
EET 317	Analog Electronics II	4.0
EET 323	Electrical Systems Design	3.0
INDE 370	Industrial Project Management	3.0
Free Elective		3.0
	Term Credits	17.0
Term 10		
MET 421 [WI]	Senior Design Project I	3.0
HIST 285	Technology in Historical Perspective	4.0
General Educational Elective		3.0
Technical Elective		3.0
	Term Credits	13.0
Term 11		
MET 422	Senior Design Project II	3.0
Free elective		3.0
General Educational Elective		3.0
Technical Elective		3.0
	Term Credits	12.0
Term 12		
EET 325	Microprocessors	3.0
MET 423 [WI]	Senior Design Project III	3.0
Free Elective		3.0
General Educational Elective		3.0
	Term Credits	12.0

Total Credit: 185.5

Engineering Technology

Healthcare Engineering Technology Concentration

Effective March 15, 2020, new students are no longer being accepted into this concentration, however similar options are available. Contact Gerry Willis at gtm23@drexel.edu **or 215-895-6253 for additional information.**

The Healthcare Engineering Technology concentration focuses on the practice of medical equipment operation and support in the clinical environment. This concentration provides students with the knowledge they need to work in the medical field, operating complicated diagnostic and patient care equipment.

During the first three years, students of all concentrations in engineering technology take electrical, mechanical, and industrial courses to get a solid, systematic background in different engineering fields. Students are required to complete general and concentration engineering technology courses, technical electives, and free elective courses that permit students great latitude in tailoring the program of study to match their career goals.

Additional Information

For more information on the Healthcare Engineering Technology concentration, please contact Gerry Willis at gtm23@drexel.edu or 215-895-6253.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Humanities and Social Sciences Requirements

COM 230	Techniques of Speaking	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
HIST 285	Technology in Historical Perspective	4.0
PHIL 315	Engineering Ethics	3.0
General Educational Electives		9.0

Basic Science Requirements

CHEM 101	General Chemistry I	3.5
PHYS 152	Introductory Physics I	4.0
PHYS 153	Introductory Physics II	4.0
PHYS 154	Introductory Physics III	4.0

Mathematics Requirements

MATH 110	Precalculus	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
STAT 201	Introduction to Business Statistics	4.0

Engineering Technology Core

EET 102	Introduction to Engineering Technology	3.0
EET 201	Circuit Analysis I	4.0
EET 202	Circuit Analysis II	4.0
EET 204	Introduction to Nanotechnology	3.0
EET 205	Digital Electronics	4.0
EET 208	Introduction to Programming for Embedded Systems	3.0
EET 209	Fundamentals of Virtual Instrumentation	3.0
EET 311	Modeling of Engineering Systems	4.0
EET 319	PLC Fundamentals	4.0
EET 320	Renewable Energy Systems	3.0
EET 333 [WI]	Non-Destructive Evaluation of Materials	4.0
EET 401	Applied Microcontrollers	4.0
MET 100	Graphical Communication	3.0
MET 101	Engineering Materials	3.0
MET 204	Applied Quality Control	3.0
MET 205	Robotics and Mechatronics	3.0
MET 209	Fluid Power	4.0
MET 213	Applied Mechanics	4.0
MHT 205	Thermodynamics I	3.0
MHT 226	Measurement Techniques and Instrumentation	3.0
INDE 240	Technology Economics	3.0
INDE 370	Industrial Project Management	3.0
Healthcare Engineering Technology Concentration Requirements		
BET 301	Healthcare Technology	3.0
BET 302	Biomedical Electronics	4.0
BET 303	Medical Imaging Systems	3.0
BET 307	Applied Biomedical Instrumentation	3.0
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
BMES 302	Laboratory II: Biomeasurements	2.0
BMES 335	Biomedical Informatics I	3.0
BMES 391	Biomedical Instrumentation I	3.0
BMES 488	Medical Device Development	3.0
Technical Electives		
Students select 6.0 additional credits from any BET, EET, MET, MHT, or INDE courses not already required. See advisor for specific courses.		6.0
Capstone Course Requirements		
MET 421 [WI]	Senior Design Project I	3.0
MET 422	Senior Design Project II	3.0
MET 423 [WI]	Senior Design Project III	3.0
Miscellaneous		
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
UNIV E101	The Drexel Experience	1.0
Free Electives		**7.0**
Total Credits		185.5

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/

english-philosophy/university-writing-program/drexel-writing-center/)
Students scheduling their courses can also conduct a search for courses
with the attribute "WI" to bring up a list of all writing-intensive courses
available that term.

Sample Plan of Study

Students participating in the cooperative education program will be
enrolled in the required prep course, COOP 101, generally three terms
before their co-op begins. As of September 2020, COOP 101 will be one
credit.

5 YR UG Co-op Concentration

Term 1		Credits
CHEM 101	General Chemistry I	3.5
EET 102	Introduction to Engineering Technology	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 110	Precalculus	3.0
PHYS 152	Introductory Physics I	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	17.5
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
EET 208	Introduction to Programming for Embedded Systems	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 121	Calculus I	4.0
MET 100	Graphical Communication	3.0
PHYS 153	Introductory Physics II	4.0
	Term Credits	18.0
Term 3		
COOP 101	Career Management and Professional Development	0.0
EET 209	Fundamentals of Virtual Instrumentation	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 122	Calculus II	4.0
MET 101	Engineering Materials	3.0
PHYS 154	Introductory Physics III	4.0
	Term Credits	17.0
Term 4		
EET 201	Circuit Analysis I	4.0
EET 333 [WI]	Non-Destructive Evaluation of Materials	4.0
MET 209	Fluid Power	4.0
STAT 201	Introduction to Business Statistics	4.0
	Term Credits	16.0
Term 5		
EET 202	Circuit Analysis II	4.0
EET 204	Introduction to Nanotechnology	3.0
EET 205	Digital Electronics	4.0
MET 205	Robotics and Mechatronics	3.0
MHT 205	Thermodynamics I	3.0
	Term Credits	17.0
Term 6		
COM 230	Techniques of Speaking	3.0
EET 311	Modeling of Engineering Systems	4.0
EET 319	PLC Fundamentals	4.0
MET 213	Applied Mechanics	4.0
	Term Credits	15.0
Term 7		
EET 401	Applied Microcontrollers	4.0

INDE 240	Technology Economics	3.0
MET 204	Applied Quality Control	3.0
MHT 226	Measurement Techniques and Instrumentation	3.0
EET 320	Renewable Energy Systems	3.0
	Term Credits	16.0
Term 8		
BET 301	Healthcare Technology	3.0
BET 302	Biomedical Electronics	4.0
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
BMES 302	Laboratory II: Biomeasurements	2.0
PHIL 315	Engineering Ethics	3.0
	Term Credits	16.0
Term 9		
BET 303	Medical Imaging Systems	3.0
BMES 335	Biomedical Informatics I	3.0
BMES 391	Biomedical Instrumentation I	3.0
INDE 370	Industrial Project Management	3.0
Free Elective		3.0
	Term Credits	15.0
Term 10		
BET 307	Applied Biomedical Instrumentation	3.0
MET 421 [WI]	Senior Design Project I	3.0
HIST 285	Technology in Historical Perspective	4.0
General Educational Elective		3.0
	Term Credits	13.0
Term 11		
BMES 488	Medical Device Development	3.0
MET 422	Senior Design Project II	3.0
General Educational Elective		3.0
Technical Elective		3.0
	Term Credits	12.0
Term 12		
MET 423 [WI]	Senior Design Project III	3.0
Free elective		4.0
General Educational Elective		3.0
Technical Elective		3.0
	Term Credits	13.0

Total Credit: 185.5

Engineering Technology

Industrial Engineering Technology Concentration

**Effective March 15, 2020, new students are no longer being accepted
into this concentration, however similar options are available.
Contact Gerry Willis at** gtm23@drexel.edu **or 215-895-6253 for
additional information.**

The industrial engineering technology concentration provides students
with knowledge and skills in management and relevant engineering
technology disciplines for manufacturing, service, and healthcare
enterprises, including automation, logistics, scheduling, simulation,
maintainability, and advanced manufacturing processes. Students learn
how to co-ordinate, integrate, and optimize people, machines, materials,
and energy to improve efficiency, sustainability, quality, and environment.

During the first three years, students of all concentrations in engineering
technology take electrical, mechanical, and industrial courses to get a
solid, systematic background in different engineering fields. Students are
required to complete general and concentration engineering technology

courses, technical electives, and free elective courses that permit students great latitude in tailoring the program of study to match their career goals.

Additional Information

For more information, please contact Gerry Willis at gtm23@drexel.edu or 215-895-6253.

Industrial Engineering Technology Concentration

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Degree Requirements

Humanities and Social Sciences Requirements		
COM 230	Techniques of Speaking	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
HIST 285	Technology in Historical Perspective	4.0
PHIL 315	Engineering Ethics	3.0
General Educational Electives		9.0
Basic Science Requirements		
CHEM 101	General Chemistry I	3.5
PHYS 152	Introductory Physics I	4.0
PHYS 153	Introductory Physics II	4.0
PHYS 154	Introductory Physics III	4.0
Mathematics Requirements		
MATH 110	Precalculus	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
STAT 201	Introduction to Business Statistics	4.0
Engineering Technology Core		
EET 102	Introduction to Engineering Technology	3.0
EET 201	Circuit Analysis I	4.0
EET 202	Circuit Analysis II	4.0
EET 204	Introduction to Nanotechnology	3.0
EET 205	Digital Electronics	4.0
EET 208	Introduction to Programming for Embedded Systems	3.0
EET 209	Fundamentals of Virtual Instrumentation	3.0
EET 311	Modeling of Engineering Systems	4.0
EET 319	PLC Fundamentals	4.0
EET 320	Renewable Energy Systems	3.0
EET 333 [WI]	Non-Destructive Evaluation of Materials	4.0
EET 401	Applied Microcontrollers	4.0
INDE 240	Technology Economics	3.0
INDE 370	Industrial Project Management	3.0
MET 100	Graphical Communication	3.0
MET 101	Engineering Materials	3.0
MET 204	Applied Quality Control	3.0
MET 205	Robotics and Mechatronics	3.0
MET 209	Fluid Power	4.0
MET 213	Applied Mechanics	4.0
MHT 205	Thermodynamics I	3.0

MHT 226	Measurement Techniques and Instrumentation	3.0
Industrial Engineering Technology Concentration Requirements		
ACCT 110	Accounting for Professionals	4.0
FIN 301	Introduction to Finance	4.0
INDE 331	Lean Manufacturing	3.0
INDE 350	Industrial Engineering Simulation	3.0
INDE 365	Systems Analysis Methods I	3.0
INDE 366	Systems Analysis Methods II	3.0
INDE 420	Industrial Energy Systems	4.0
MET 408	MFG Information Management	3.0
IET Technical Electives		
Students select 6.0 additional credits from any BET, EET, MET, MHT, INDE, OPM, or MKTG courses not already required. See advisor for specific courses.		6.0
Capstone Course Requirements		
MET 421 [WI]	Senior Design Project I	3.0
MET 422	Senior Design Project II	3.0
MET 423 [WI]	Senior Design Project III	3.0
Miscellaneous		
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
UNIV E101	The Drexel Experience	1.0
Free Electives		**8.0**
Total Credits		185.5

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Industrial Engineering Technology Concentration

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Sample Plan of Study

5 YR UG Co-op Concentration

Term 1		Credits
CHEM 101	General Chemistry I	3.5
EET 102	Introduction to Engineering Technology	3.0

ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 110	Precalculus	3.0
PHYS 152	Introductory Physics I	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	17.5
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
EET 208	Introduction to Programming for Embedded Systems	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 121	Calculus I	4.0
MET 100	Graphical Communication	3.0
PHYS 153	Introductory Physics II	4.0
	Term Credits	18.0
Term 3		
COOP 101	Career Management and Professional Development	0.0
EET 209	Fundamentals of Virtual Instrumentation	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 122	Calculus II	4.0
MET 101	Engineering Materials	3.0
PHYS 154	Introductory Physics III	4.0
	Term Credits	17.0
Term 4		
EET 201	Circuit Analysis I	4.0
EET 333 [WI]	Non-Destructive Evaluation of Materials	4.0
MET 209	Fluid Power	4.0
STAT 201	Introduction to Business Statistics	4.0
	Term Credits	16.0
Term 5		
EET 202	Circuit Analysis II	4.0
EET 204	Introduction to Nanotechnology	3.0
EET 205	Digital Electronics	4.0
MET 205	Robotics and Mechatronics	3.0
MHT 205	Thermodynamics I	3.0
	Term Credits	17.0
Term 6		
COM 230	Techniques of Speaking	3.0
EET 311	Modeling of Engineering Systems	4.0
EET 319	PLC Fundamentals	4.0
MET 213	Applied Mechanics	4.0
	Term Credits	15.0
Term 7		
EET 320	Renewable Energy Systems	3.0
EET 401	Applied Microcontrollers	4.0
INDE 240	Technology Economics	3.0
MET 204	Applied Quality Control	3.0
MHT 226	Measurement Techniques and Instrumentation	3.0
	Term Credits	16.0
Term 8		
ACCT 110	Accounting for Professionals	4.0
INDE 365	Systems Analysis Methods I	3.0
INDE 331	Lean Manufacturing	3.0
MET 408	MFG Information Management	3.0
PHIL 315	Engineering Ethics	3.0
	Term Credits	16.0
Term 9		
FIN 301	Introduction to Finance	4.0
INDE 366	Systems Analysis Methods II	3.0
INDE 370	Industrial Project Management	3.0

INDE 420	Industrial Energy Systems	4.0
	Term Credits	14.0
Term 10		
MET 421 [WI]	Senior Design Project I	3.0
HIST 285	Technology in Historical Perspective	4.0
Free electives		4.0
General Educational Elective		3.0
	Term Credits	14.0
Term 11		
MET 422	Senior Design Project II	3.0
INDE 350	Industrial Engineering Simulation	3.0
General Educational Elective		3.0
Technical elective (See advisor)		3.0
	Term Credits	12.0
Term 12		
MET 423 [WI]	Senior Design Project III	3.0
Free elective		4.0
General Educational Elective		3.0
Technical elective (See advisor)		3.0
	Term Credits	13.0

Total Credit: 185.5

Engineering Technology

Mechanical and Manufacturing Concentration

During the first three years, students of all concentrations in engineering technology take electrical, mechanical, and industrial courses to get a solid, systematic background in different engineering fields. Students are required to complete general and concentration engineering technology courses, technical electives, and free elective courses that permit students great latitude in tailoring the program of study to match their career goals.

Additional Information

For more information on the Green Energy and Sustainability minor, please contact Gerry Willis at gtm23@drexel.edu or 215-895-6253.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Humanities and Social Sciences Requirements

COM 230	Techniques of Speaking	3.0
ENGL 101 or ENGL 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENGL 102 or ENGL 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
ENGL 103 or ENGL 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
HIST 285	Technology in Historical Perspective	4.0
PHIL 315	Engineering Ethics	3.0
General Educational Electives		9.0
Basic Science Requirements		
CHEM 101	General Chemistry I	3.5
PHYS 152	Introductory Physics I	4.0
PHYS 153	Introductory Physics II	4.0

PHYS 154	Introductory Physics III	4.0
Mathematics Requirements		
MATH 110	Precalculus	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
STAT 201	Introduction to Business Statistics	4.0
Engineering Technology Core		
EET 102	Introduction to Engineering Technology	3.0
EET 201	Circuit Analysis I	4.0
EET 202	Circuit Analysis II	4.0
EET 204	Introduction to Nanotechnology	3.0
EET 205	Digital Electronics	4.0
EET 208	Introduction to Programming for Embedded Systems	3.0
EET 209	Fundamentals of Virtual Instrumentation	3.0
EET 311	Modeling of Engineering Systems	4.0
EET 319	PLC Fundamentals	4.0
EET 320	Renewable Energy Systems	3.0
EET 333 [WI]	Non-Destructive Evaluation of Materials	4.0
EET 401	Applied Microcontrollers	4.0
INDE 240	Technology Economics	3.0
INDE 370	Industrial Project Management	3.0
MET 100	Graphical Communication	3.0
MET 101	Engineering Materials	3.0
MET 204	Applied Quality Control	3.0
MET 205	Robotics and Mechatronics	3.0
MET 209	Fluid Power	4.0
MET 213	Applied Mechanics	4.0
MHT 205	Thermodynamics I	3.0
MHT 226	Measurement Techniques and Instrumentation	3.0
Mechanical Engineering Technology Concentration Requirements		
MET 316	Computer Numerical Control	3.0
MET 407	Manufacturing Processes	3.0
MET 408	MFG Information Management	3.0
MHT 206	Thermodynamics II	3.0
MHT 222	Applied Dynamics I	4.0
MHT 301	Fluid Mechanics I	3.0
MHT 314	Thermo and Heat Transfer Analysis	3.0
MHT 401	Mechanical Design I	4.0
MHT Technical Electives		
Students select 6.0 additional credits from any BET, EET, MET, MHT or INDE courses not already required. See advisor for specific courses.		6.0
Capstone Course Requirements		
MET 421 [WI]	Senior Design Project I	3.0
MET 422	Senior Design Project II	3.0
MET 423 [WI]	Senior Design Project III	3.0
Miscellaneous		
COOP 101	Career Management and Professional Development	0.0
CIVC 101	Introduction to Civic Engagement	1.0
UNIV E101	The Drexel Experience	1.0
Free Electives		**9.0**
Total Credits		185.5

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Mechanical and Manufacturing Engineering Technology Concentration

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Sample Plan of Study

5 YR UG Co-op Concentration

Term 1		Credits
CHEM 101	General Chemistry I	3.5
EET 102	Introduction to Engineering Technology	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 110	Precalculus	3.0
PHYS 152	Introductory Physics I	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	17.5
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
EET 208	Introduction to Programming for Embedded Systems	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 121	Calculus I	4.0
MET 100	Graphical Communication	3.0
PHYS 153	Introductory Physics II	4.0
	Term Credits	18.0
Term 3		
COOP 101	Career Management and Professional Development	0.0
EET 209	Fundamentals of Virtual Instrumentation	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 122	Calculus II	4.0
MET 101	Engineering Materials	3.0
PHYS 154	Introductory Physics III	4.0
	Term Credits	17.0
Term 4		
MET 209	Fluid Power	4.0
EET 201	Circuit Analysis I	4.0
EET 333 [WI]	Non-Destructive Evaluation of Materials	4.0
STAT 201	Introduction to Business Statistics	4.0
	Term Credits	16.0
Term 5		
EET 202	Circuit Analysis II	4.0
EET 204	Introduction to Nanotechnology	3.0
EET 205	Digital Electronics	4.0

MET 205	Robotics and Mechatronics	3.0
MHT 205	Thermodynamics I	3.0
	Term Credits	17.0
Term 6		
COM 230	Techniques of Speaking	3.0
EET 311	Modeling of Engineering Systems	4.0
EET 319	PLC Fundamentals	4.0
MET 213	Applied Mechanics	4.0
	Term Credits	15.0
Term 7		
EET 320	Renewable Energy Systems	3.0
EET 401	Applied Microcontrollers	4.0
INDE 240	Technology Economics	3.0
MET 204	Applied Quality Control	3.0
MHT 226	Measurement Techniques and Instrumentation	3.0
	Term Credits	16.0
Term 8		
MET 316	Computer Numerical Control	3.0
MHT 206	Thermodynamics II	3.0
MHT 222	Applied Dynamics I	4.0
MHT 301	Fluid Mechanics I	3.0
PHIL 315	Engineering Ethics	3.0
	Term Credits	16.0
Term 9		
INDE 370	Industrial Project Management	3.0
MET 407	Manufacturing Processes	3.0
MHT 314	Thermo and Heat Transfer Analysis	3.0
MHT 401	Mechanical Design I	4.0
Free Elective		3.0
	Term Credits	16.0
Term 10		
HIST 285	Technology in Historical Perspective	4.0
MET 421 [WI]	Senior Design Project I	3.0
MET 408	MFG Information Management	3.0
General Educational Elective		3.0
	Term Credits	13.0
Term 11		
MET 422	Senior Design Project II	3.0
Free elective		3.0
General Educational Elective		3.0
Technical elective (See advisor)		3.0
	Term Credits	12.0
Term 12		
MET 423 [WI]	Senior Design Project III	3.0
Free elective		3.0
General Educational Elective		3.0
Technical elective (See advisor)		3.0
	Term Credits	12.0

Total Credit: 185.5

Environmental Engineering

Major: Environmental Engineering
Degree Awarded: Bachelor of Science in Environmental Engineering (BSENE)
Calendar Type: Quarter
Total Credit Hours: 190.5
Co-op Options: Three Co-op (Five years); One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 14.1401
Standard Occupational Classification (SOC) code: 17-2081

About the Program

Environmental engineering is concerned with the design of systems, policies and processes to protect human, animal, and plant populations from the effects of adverse environmental factors, including toxic chemicals and wastes, pathogenic bacteria, and global warming, and to design systems that enable a more sustainable society.

Environmental engineers design systems, processes and policies to minimize the effect of human activities on the physical and living environment so that we can all live more healthy and sustainable lives. Environmental engineers work to meet human needs for resources in ways to minimize impact on the ecosystem and adverse effects on health. This field builds on other branches of engineering, especially civil, chemical, and mechanical engineering. It also builds on information from many of the sciences, such as chemistry, physics, hydrology, geology, atmospheric science, and several specializations of biology (ecology, microbiology, and biochemistry). Students who elect to study environmental engineering will become familiar with many of these areas because maintaining and improving the environment requires that problems be evaluated and solutions found using a multidisciplinary approach.

Mission

The mission of the undergraduate environmental engineering program at Drexel University is to graduate outstanding engineers who can identify, evaluate and solve complex environmental problems, and who desire to continue their education on a lifelong basis.

Program Educational Objectives

Environmental engineering graduates will become responsible professionals who analyze, design, construct, manage or operate facilities or systems to protect or enhance the environment of people and other living things, or advance knowledge of the field.

Student Outcomes

The department's student outcomes reflect the skills and abilities that the curriculum is designed to provide to students by the time they graduate. These are:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

3. An ability to communicate effectively with a range of audiences

4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Additional Information

The Environmental Engineering program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (http://www.abet.org).

For more information about this major, visit the Civil, Architectural and Environmental Engineering Department (http://www.cae.drexel.edu/) and the BS in Environmental Engineering (http://www.drexel.edu/cae/academics/bs-environmental-engineering/) page.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education/Liberal Studies Requirements

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 315	Engineering Ethics	3.0
UNIV E101	The Drexel Experience	1.0
General Education Requirements [*]		15.0

Engineering Core Courses

BIO 141	Essential Biology	4.5
CAEE 361	Statistical Analysis of Engineering Systems	3.0
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
ENGR 113	First-Year Engineering Design	3.0
ENGR 131	Introductory Programming for Engineers	3.0
or ENGR 132	Programming for Engineers	
ENGR 210	Introduction to Thermodynamics	3.0
ENGR 220	Fundamentals of Materials	4.0
ENGR 231	Linear Engineering Systems	3.0
ENGR 232	Dynamic Engineering Systems	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 200	Multivariate Calculus	4.0
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
PHYS 201	Fundamentals of Physics III	4.0

Environmental Engineering Requirements

BIO 221	Microbiology	3.0
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
CAEE 203	System Balances and Design in CAEE	3.0
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
CHE 211	Material and Energy Balances I	4.0
CHEM 230	Quantitative Analysis	4.0
CHEM 231 [WI]	Quantitative Analysis Laboratory	2.0
CHEM 241	Organic Chemistry I	4.0
CHEM 242	Organic Chemistry II	4.0
CIVE 240 [WI]	Engineering Economic Analysis	3.0
CIVE 320	Introduction to Fluid Flow	3.0
CIVE 330	Hydraulics	4.0
CIVE 430	Hydrology	3.0
CIVE 431	Hydrology-Ground Water	3.0
ENVE 300	Introduction to Environmental Engineering	3.0
ENVE 302	Environmental Transport and Kinetics	3.0
ENVE 410	Solid and Hazardous Waste	3.0
ENVE 421	Water and Waste Treatment II	3.0
ENVE 422	Water and Waste Treatment Design	3.0
ENVE 435	Groundwater Remediation	3.0
ENVE 460	Fundamentals of Air Pollution Control	3.0
or ENVE 465	Indoor Air Quality	
ENVE 485	Professional Environmental Engineering Practice	1.0
ENVE 486	Environmental Engineering Processes Laboratory I	2.0
ENVE 487	Environmental Engineering Processes Laboratory II	2.0
ENVE 491 [WI]	Senior Project Design I	3.0
ENVE 492 [WI]	Senior Design Project II	3.0
ENVE 493 [WI]	Senior Design Project III	3.0
ENVS 230	General Ecology	3.0
ENVS 401	Chemistry of the Environment	3.0
Technical Electives		**12.0**
Total Credits		190.5

[*] General Education Requirements (p. 215).

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

5 YR UG Co-op Concentration

Term 1		Credits
CHEM 101	General Chemistry I	3.5
COOP 101	Career Management and Professional Development	0.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
MATH 121	Calculus I	4.0

UNIV E101	The Drexel Experience	1.0
	Term Credits	14.5
Term 2		
CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 131 or 132	Introductory Programming for Engineers Programming for Engineers	3.0
MATH 122	Calculus II	4.0
PHYS 101	Fundamentals of Physics I	4.0
	Term Credits	16.5
Term 3		
BIO 141	Essential Biology	4.5
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
ENGR 113	First-Year Engineering Design	3.0
MATH 200	Multivariate Calculus	4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	18.5
Term 4		
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
ENGL 103 or CIVE 240 [WI]	Composition and Rhetoric III: Themes and Genres Engineering Economic Analysis	3.0
ENGR 220	Fundamentals of Materials	4.0
ENGR 231	Linear Engineering Systems	3.0
PHYS 201	Fundamentals of Physics III	4.0
	Term Credits	17.0
Term 5		
CAEE 203	System Balances and Design in CAEE	3.0
ENGL 103 or CIVE 240 [WI]	Composition and Rhetoric III: Themes and Genres Engineering Economic Analysis	3.0
ENGR 210	Introduction to Thermodynamics	3.0
ENGR 232	Dynamic Engineering Systems	3.0
ENVS 230	General Ecology	3.0
	Term Credits	15.0
Term 6		
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
CHE 211	Material and Energy Balances I	4.0
CHEM 230	Quantitative Analysis	4.0
CIVE 320	Introduction to Fluid Flow	3.0
ENVE 300	Introduction to Environmental Engineering	3.0
	Term Credits	18.0
Term 7		
CHEM 231 [WI]	Quantitative Analysis Laboratory	2.0
CIVE 330	Hydraulics	4.0
ENVE 302	Environmental Transport and Kinetics	3.0
PHIL 315	Engineering Ethics	3.0
General Education elective[*]		3.0
	Term Credits	15.0
Term 8		
CAEE 361	Statistical Analysis of Engineering Systems	3.0
CHEM 241	Organic Chemistry I	4.0
CIVE 430	Hydrology	3.0
ENVS 401	Chemistry of the Environment	3.0
General Education elective[*]		3.0
	Term Credits	16.0
Term 9		
BIO 221	Microbiology	3.0
CHEM 242	Organic Chemistry II	4.0
Technical elective		3.0
General Education elective[*]		6.0
	Term Credits	16.0

Term 10		
ENVE 485	Professional Environmental Engineering Practice	1.0
ENVE 491 [WI]	Senior Project Design I	3.0
ENVE 465 or 460	Indoor Air Quality Fundamentals of Air Pollution Control	3.0
Technical elective		3.0
Technical Elective		3.0
	Term Credits	13.0
Term 11		
CIVE 431	Hydrology-Ground Water	3.0
ENVE 410	Solid and Hazardous Waste	3.0
ENVE 421	Water and Waste Treatment II	3.0
ENVE 486	Environmental Engineering Processes Laboratory I	2.0
ENVE 492 [WI]	Senior Design Project II	3.0
Technical elective		3.0
	Term Credits	17.0
Term 12		
ENVE 422	Water and Waste Treatment Design	3.0
ENVE 435	Groundwater Remediation	3.0
ENVE 487	Environmental Engineering Processes Laboratory II	2.0
ENVE 493 [WI]	Senior Design Project III	3.0
General Education elective[*]		3.0
	Term Credits	14.0

Total Credit: 190.5

[*]   See degree requirements (p. 262).

Co-op/Career Opportunities

Environmental Engineers pursue careers with many different industries, such as chemical, pharmaceutical and manufacturing, in groundwater and hazardous waste remediation, in water or wastewater treatment, in air pollution abatement and control, and in mining. Some also join environmental consulting firms which serve several engineering areas. In addition, some students go to graduate school. The breadth of an environmental engineering education prepares the student to follow many career paths.

Co-op Experiences

Past co-op employers of Environmental Engineering majors have included:

- Exelon, Philadelphia, PA
- U.S. Environmental Protection Agency, Philadelphia, PA
- Philadelphia Water Department, Philadelphia, PA
- Sun Co., Philadelphia, PA
- Aqua America, Bryn Mawr, PA
- Fairmount Park Commission, Philadelphia, PA
- Weston Solutions, West Chester, PA
- CDM Consultants, Philadelphia PA and other offices

Dual/Accelerated Degree

The Accelerated Program of the College of Engineering provides opportunities for highly talented and strongly motivated students to progress toward their educational goals essentially at their own pace. Through advanced placement, credit by examination, flexibility of scheduling, and independent study, the program makes it possible to complete the undergraduate curriculum and initiate graduate study in less than the five years required by the standard curriculum.

Bachelor's/Master's Dual Degree Program

Drexel offers a combined BS/MS degree program for our top engineering students who want to obtain both degrees in the same time period as most students obtain a Bachelors degree.

For more information on this program visit the Department's BS/MS Dual Degree Program (https://drexel.edu/engineering/academics/departments/civil-architectural-environmental-engineering/academic-programs/undergraduate/accelerated-and-dual-degree-programs/) page.

Facilities

The Department is well equipped with state-of-the-art facilities:

- The department computer labs are in operation: a computer-assisted design (CAD) and computerized instructional lab; and a graduate-level lab (advanced undergraduates can become involved in graduate-level work)
- External labs are used for surveying, building diagnostics, and surface and ground-water measurements
- Molecular microbiology laboratory to conduct PCR and qPCR analyses, as well as classical measurements
- Analytical equipment for chemical contaminants
- Instrumentation for characterization of indoor and outdoor atmospheric aerosols

Civil, Architectural and Environmental Engineering Faculty

Abieyuwa Aghayere, PhD *(University of Alberta)*. Professor. Structural design - concrete, steel and wood; structural failure analysis; retrofitting of existing structures; new structural systems and materials; engineering education.

Ivan Bartoli, PhD *(University of California, San Diego)*. Associate Professor. Non-destructive evaluation and structural health monitoring; dynamic identification, stress wave propagation modeling.

Robert Brehm, PhD *(Drexel University)*. Teaching Professor. International infrastructure delivery; response to natural catastrophes; risk assessment and mitigation strategies; project management techniques.

Shannon Capps, PhD *(Georgia Institute of Technology)*. Assistant Professor. Atmospheric chemistry; data assimilation; advanced sensitivity analysis; inverse modeling.

S.C. Jonathan Cheng, PhD *(West Virginia University)*. Associate Professor. Soil mechanics; geosynthetics; geotechnical engineering; probabilistic design; landfill containments; engineering education.

Eugenia Ellis, PhD, AIA *(Virginia Polytechnic Institute and State University)*. Professor. Natural and electric light sources and effects on biological rhythms and health outcomes; ecological strategies for smart, sustainable buildings of the nexus of health, energy and technology.

Yaghoob (Amir) Farnam, PhD *(Purdue University)*. Assistant Professor. Advanced and sustainable infrastructure materials; multifunctional, self-responsive and bioinspired construction materials; advanced multiscale manufacturing; characterization, and evaluation of construction materials; durability of cement-based materials.

Patricia Gallagher, PhD *(Virginia Polytechnic Institute and State University)*. Professor. Geotechnical and geoenvironmental engineering; soil improvement; soil improvement; recycled materials in geotechnics.

Patrick Gurian, PhD *(Carnegie-Mellon University)*. Professor. Risk analysis of environmental and infrastructure systems; novel adsorbent materials; environmental standard setting; Bayesian statistical modeling; community outreach and environmental health.

Charles N. Haas, PhD *(University of Illinois-Urbana) L. D. Betz Chair Professor of Environmental Engineering and Department Head, Civil, Architectural and Environmental Engineering*. Water treatment; risk assessment; bioterrorism; environmental modeling and statistics; microbiology; environmental health.

Ahmad Hamid, PhD *(McMaster University)*. Professor. Engineered masonry; seismic behavior, design and retrofit of masonry structures; development of new materials and building systems.

Simi Hoque, PhD *(University of California - Berkeley)*. Associate Professor. Computational methods to reduce building energy and environmental impacts, urban metabolism, thermal comfort, climate resilience.

Y. Grace Hsuan, PhD *(Imperial College)*. Professor. Durability of polymeric construction materials; advanced construction materials; and performance of geosynthetics.

Joseph B. Hughes, PhD *(University of Iowa)*. Distinguished University Professor. Biological processes and applications of nanotechnology in environmental systems.

L. James Lo, PhD *(University of Texas at Austin)*. Assistant Professor. Architectural fluid mechanics; building automation and autonomy; implementation of natural and hybrid ventilation in buildings; airflow distribution in buildings; large-scale air movement in an urban built environment; building and urban informatics; data-enhanced sensing and control for optimal building operation and management; novel data gathering methods for building/urban problem solving; interdisciplinary research on occupant behaviors in the built environment.

Joseph P. Martin, PhD *(Colorado State University)*. Professor. Geotechnical and geoenvironmental engineering; hydrology; transportation; waste management.

Franco Montalto, PhD *(Cornell University)*. Professor. Effects of built infrastructure on societal water needs, ecohydrologic patterns and processes, ecological restoration, green design, and water interventions.

Nariman Mostafavi, PhD *(University of Massachusetts - Amherst)*. Assistant Teaching Professor. Simulation tools for analyzing urban metabolism; environmentally responsive design; urban resilience; engineering economics; industrial ecology.

Mira S. Olson, PhD *(University of Virginia)*. Associate Professor. Peace engineering; source water quality protection and management; contaminant and bacterial fate and transport; community engagement.

Miguel A. Pando, PhD *(Virginia Polytechnic Institute and State University)*. Associate Professor. Laboratory testing of geomaterials; geotechnical aspects of natural hazards; soil-structure-interaction; geotechnical engineering.

Michael Ryan, PhD *(Drexel University) Associate Department Head of Graduate Studies*. Associate Teaching Professor. Microbial Source

Tracking (MST); Quantitative Microbial Risk Assessment (QMRA); dynamic engineering systems modeling; molecular microbial biology; phylogenetics; metagenomics; bioinformatics; environmental statistics; engineering economics; microbiology; potable and waste water quality; environmental management systems.

Christopher Sales, PhD *(University of California, Berkeley)*. Associate Professor. Environmental microbiology and biotechnology; biodegradation of environmental contaminants; microbial processes for energy and resource recovery from waste; application of molecular biology, analytical chemistry and bioinformatic techniques to study environmental biological systems.

Sabrina Spatari, PhD *(University of Toronto)*. Associate Professor. Industrial ecology; development and application of life cycle assessment (LCA) and material flow analysis (MFA) methods for guiding engineering and policy decisions; specific interest in biomass and bioenergy, biofuels, and urban infrastructure.

Robert Swan Teaching Professor. Geotechnical and geosynthetic engineering; soil/geosynthetic interaction and performance; laboratory and field geotechnical/geosynthetic testing; data acquisition and instrumentation; test equipment development and test method standardization; Quality System Management (QSM) and continuous improvement.

Sharon Walker, PhD *(Yale University) Dean of the College of Engineering*. Distinguished University Professor. Water quality systems engineering.

Michael Waring, PhD *(University of Texas-Austin) Associate Department Head for Undergraduate Programs; Director of Architectural Engineering Program*. Professor. Indoor air quality and building sustainability; indoor particulate matter fate and transport; indoor chemistry and particle formation; secondary impacts of control technologies and strategies.

Jin Wen, PhD *(University of Iowa)*. Professor. Building energy efficiency; building-grid interaction; building control and operation; fault detection and diagnosis; human-building interactions; dynamic building system simulation; big data.

Aspasia Zerva, PhD *(University of Illinois - Urbana)*. Professor. Earthquake engineering; engineering seismology; structural reliability; system identification; advanced computational methods in structural analysis.

Emeritus Faculty

A. Emin Aktan, PhD *(University of Illinois at Urbana-Champaign) John Roebling Emeritus Professor of Infrastructure Studies*. Professor Emeritus. Structural engineering; health monitoring of large infrastructure systems; infrastructure evaluation; intelligent systems.

Harry G. Harris, PhD *(Cornell University)*. Professor Emeritus. Structural models; dynamics of structures, plates and shells; industrialized building construction.

James E. Mitchell, MArch *(University of Pennsylvania)*. Professor Emeritus. Architectural engineering design; building systems; engineering education.

Joseph V. Mullin, PhD *(Pennsylvania State University) Associate Department Head*. Teaching Professor. Structural engineering; failure analysis; experimental stress analysis; materials of construction; marine structures; engineering education.

Richard Weggel, PhD *(University of Illinois) Samuel S. Baxter Professor Emeritus; Civil and Environmental Engineering*. Professor Emeritus. Coastal engineering; hydraulics engineering; hydrology.

Richard Woodring, PhD *(University of Illinois) Dean of Engineering Emeritus*. Professor Emeritus. Structural engineering, reinforced concrete.

Materials Science and Engineering

Major: Materials Science and Engineering
Degree Awarded: Bachelor of Science in Materials Science and Engineering (BSMSE)
Calendar Type: Quarter
Total Credit Hours: 185.5
Co-op Options: Three Co-op (Five years); One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 14.1801
Standard Occupational Classification (SOC) code: 17-2131

About the Program

Materials science and engineering (MSE) is concerned with the production, structure, characterization, properties and utilization of metals, ceramics, polymers, composites, electronic, optical, nano- and bio-compatible materials. Materials scientists and engineers play a key role in our increasingly complex technological society by extending the limited supply of materials, improving existing materials, and developing and designing new and superior materials and processes with an awareness of their cost, reliability, safety, and societal/environmental implications.

Students majoring in materials science and engineering (MSE) receive a thorough grounding in the basic sciences and engineering of all materials. All students are required to take course sequences that include materials processing, thermodynamics and kinetics of materials, and their physical and mechanical behavior, plus laboratories designed to familiarize them with the instruments and advanced techniques used to characterize materials and evaluate their structure, properties and performance. A number of tracks allow upper-level students to focus their technical electives in areas of specialization, including nanoscale materials and nanotechnology, biomaterials, electronic and photonic materials, soft materials and polymers, advanced materials design and processing, or in a custom track. In addition, several required senior level courses emphasize the role of materials selection and specification in design.

Throughout the senior year, students majoring in materials science and engineering (MSE) work on a capstone senior design project over the course of three terms, with guidance from a faculty advisor and graduate student mentor. Students, generally working in small groups, synthesize information from their courses to arrive at solutions to real-world engineering problems.

Some recent senior design project topics include:

- Low Cost Plasma Cleaner Using Microwave Radiation
- Characterization of γ' as a Function of Thermal Handling
- Grain Boundary Engineering in Alloy 625 Plus
- Effect of Titanium Additions to HSLA-100 Steel
- Synthesis and Characterizations of Metal-Halide Perovskite Containing Micelles
- Materials Discovery Through Machine Learning
- Biomimetic Mineralization of Bone

- Novel Use of Biomimetic Aggrecan to Regenerate and Molecularly Repair Damaged Skin
- 3-D Printing of PLA and Bone Scaffold Mimetic with Microstructural Analyses

Mission Statement

The Department of Materials Science and Engineering (http://www.drexel.edu/materials/) will provide our BS, MS and PhD graduates with the technical and theoretical knowledge, design capabilities, professionalism, and communications skills necessary for them to excel in leadership positions in academia, industry, and government at the national and international levels.

Vision

Materials science and engineering is a multi-disciplinary field that is at the forefront of all emerging technologies. Advances in the understanding of the process-structure-property-performance relationships of materials will be critical for future developments, including in energy storage and power generation, biomaterials and nanomaterials. The Department of Materials Science and Engineering at Drexel University is recognized as a leader in these areas through its teaching and scholarly research.

Program Educational Objectives

The educational objectives of the Materials Science and Engineering BS degree program are:

- Materials Science and Engineering program graduates possess the core technical competencies in their field necessary to successfully interface with other engineering disciplines in the workplace.
- At least 30% of Materials Science and Engineering program graduates have progressed towards graduate education, to become leaders in industry, academia, etc.
- Materials Science and Engineering program graduates are leaders in their chosen fields.
- Materials Science and Engineering program graduates are engaged in lifelong learning.
- Materials Science and Engineering program graduates possess written and verbal communication skills appropriate for professional materials engineers and/or scientists.

Student Outcomes

The department's student outcomes reflect the skills and abilities that the curriculum is designed to provide to students by the time they graduate. These are:

1. An ability to apply, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Additional Information

The Materials Science and Engineering program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (http://www.abet.org).

For additional information about this major, contact:

Sarit Kunz
Academic Program Coordinator
215.895.2328
skunz@coe.drexel.edu

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education/Liberal Studies Requirements

CIVC 101	Introduction to Civic Engagement	1.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 315	Engineering Ethics	3.0
UNIV E101	The Drexel Experience	1.0
Technical Electives/Track Courses [*]		12.0
Non-designated General Education Requirements [**]		12.0
Free Electives		6.0
Foundation Requirements		
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
CHE 350	Statistics and Design of Experiments	3.0
CHEC 353	Physical Chemistry and Applications III	4.0
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
CHEM 241	Organic Chemistry I	4.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
ENGR 113	First-Year Engineering Design	3.0
ENGR 131	Introductory Programming for Engineers	3.0
or ENGR 132	Programming for Engineers	
ENGR 210	Introduction to Thermodynamics	3.0
ENGR 220	Fundamentals of Materials	4.0
ENGR 231	Linear Engineering Systems	3.0
ENGR 232	Dynamic Engineering Systems	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0

MATH 200	Multivariate Calculus	4.0
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
PHYS 201	Fundamentals of Physics III	4.0
Professional Requirements		
MATE 214	Introduction to Polymers	4.0
MATE 230	Fundamentals of Materials II	4.0
MATE 240	Thermodynamics of Materials	4.0
MATE 245	Kinetics of Materials	4.0
MATE 280	Advanced Materials Laboratory	4.0
MATE 315	Processing Polymers	4.5
MATE 341	Defects in Solids	3.0
MATE 345	Processing of Ceramics	4.5
MATE 351	Electronic and Photonic Properties of Materials	4.0
MATE 355	Structure and Characterization of Crystalline Materials	3.0
MATE 366 [WI]	Processing of Metallic Materials	4.5
MATE 370	Mechanical Behavior of Solids	3.0
MATE 410	Case Studies in Materials	3.0
MATE 455	Biomedical Materials	3.0
MATE 460	Engineering Computational Laboratory	4.0
MATE 491 [WI]	Senior Project Design I	2.0
MATE 492	Senior Project Design II	3.0
MATE 493 [WI]	Senior Project Design III	3.0
Total Credits		185.5

*   A "Track" is a sequence of 4-5 technical electives (12.0-18.0 credits) with an underlying connection to a specific area of materials science and engineering. With the rapid expansion of the technical and scientific knowledge in the field of materials science and engineering, organizing technical electives into thematic tracks benefits students. Combined with relevant co-op experiences and senior design, the tracks can provide strong evidence of specialization, which will benefit students in future job searches.

Technical electives can be taken during the junior and (mostly during) the senior year. For planning reasons, better coordination with senior design, and to accommodate students with an out-of-cycle schedule (e.g., transfer students), tracks need to be declared by the beginning of the pre-junior year. Students may change their track selection after consulting with their MSE department advisor.

** Non-designated General Education Requirements (p. 215).

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses

with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

5 YR UG Co-op Concentration

Term 1		Credits
CHEM 101	General Chemistry I	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
MATH 121	Calculus I	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	14.5
Term 2		
CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 131 or 132	Introductory Programming for Engineers Programming for Engineers	3.0
MATH 122	Calculus II	4.0
PHYS 101	Fundamentals of Physics I	4.0
	Term Credits	16.5
Term 3		
COOP 101	Career Management and Professional Development	0.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
ENGR 113	First-Year Engineering Design	3.0
MATH 200	Multivariate Calculus	4.0
PHYS 102	Fundamentals of Physics II	4.0
General Education Elective		3.0
	Term Credits	17.0
Term 4		
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
ENGR 220	Fundamentals of Materials	4.0
ENGR 231	Linear Engineering Systems	3.0
PHYS 201	Fundamentals of Physics III	4.0
Free Elective		3.0
	Term Credits	18.0
Term 5		
CHEM 241	Organic Chemistry I	4.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
ENGR 210	Introduction to Thermodynamics	3.0
ENGR 232	Dynamic Engineering Systems	3.0
MATE 230	Fundamentals of Materials II	4.0
	Term Credits	17.0
Term 6		
ECON 201	Principles of Microeconomics	4.0
MATE 214	Introduction to Polymers	4.0
MATE 240	Thermodynamics of Materials	4.0
MATE 355	Structure and Characterization of Crystalline Materials	3.0
MATE 370	Mechanical Behavior of Solids	3.0
	Term Credits	18.0
Term 7		
ECON 202	Principles of Macroeconomics	4.0

MATE 245	Kinetics of Materials	4.0
MATE 315	Processing Polymers	4.5
MATE 341	Defects in Solids	3.0
	Term Credits	15.5

Term 8

MATE 280	Advanced Materials Laboratory	4.0
MATE 366 [WI]	Processing of Metallic Materials	4.5
MATE 455	Biomedical Materials	3.0
CHEC 353	Physical Chemistry and Applications III	4.0
	Term Credits	15.5

Term 9

MATE 345	Processing of Ceramics	4.5
MATE 351	Electronic and Photonic Properties of Materials	4.0
PHIL 315	Engineering Ethics	3.0
Technical Elective/Track Elective		3.0
	Term Credits	14.5

Term 10

CHE 350	Statistics and Design of Experiments	3.0
MATE 460	Engineering Computational Laboratory	4.0
MATE 491 [WI]	Senior Project Design I	2.0
General education elective*		3.0
Technical Elective/Track Elective		3.0
	Term Credits	15.0

Term 11

MATE 492	Senior Project Design II	3.0
Free elective		3.0
Technical elective/Track course		3.0
General education elective*		3.0
	Term Credits	12.0

Term 12

MATE 410	Case Studies in Materials	3.0
MATE 493 [WI]	Senior Project Design III	3.0
Technical elective/Track course		3.0
General education elective*		3.0
	Term Credits	12.0

Total Credit: 185.5

*   See degree requirements (p. 266).

4 YR UG Co-op Concentration

Term 1

		Credits
CHEM 101	General Chemistry I	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
MATH 121	Calculus I	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	14.5

Term 2

CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 131 or 132	Introductory Programming for Engineers Programming for Engineers	3.0
MATH 122	Calculus II	4.0
PHYS 101	Fundamentals of Physics I	4.0
	Term Credits	16.5

Term 3

COOP 101	Career Management and Professional Development	0.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
ENGR 113	First-Year Engineering Design	3.0
MATH 200	Multivariate Calculus	4.0
PHYS 102	Fundamentals of Physics II	4.0
General Education Elective		3.0
	Term Credits	17.0

Term 4

BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
ENGR 220	Fundamentals of Materials	4.0
ENGR 231	Linear Engineering Systems	3.0
PHYS 201	Fundamentals of Physics III	4.0
Free Elective		3.0
	Term Credits	18.0

Term 5

CHEM 241	Organic Chemistry I	4.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
ENGR 210	Introduction to Thermodynamics	3.0
ENGR 232	Dynamic Engineering Systems	3.0
MATE 230	Fundamentals of Materials II	4.0
	Term Credits	17.0

Term 6

ECON 201	Principles of Microeconomics	4.0
Technical Elective/Track Course		3.0
General Education Electives		6.0
	Term Credits	13.0

Term 7

ECON 202	Principles of Macroeconomics	4.0
PHIL 315	Engineering Ethics	3.0
Free Elective		3.0
Technical Elective/Track Course		3.0
	Term Credits	13.0

Term 8

MATE 214	Introduction to Polymers	4.0
MATE 240	Thermodynamics of Materials	4.0
MATE 280	Advanced Materials Laboratory	4.0
MATE 355	Structure and Characterization of Crystalline Materials	3.0
MATE 370	Mechanical Behavior of Solids	3.0
	Term Credits	18.0

Term 9

MATE 245	Kinetics of Materials	4.0
MATE 315	Processing Polymers	4.5
MATE 341	Defects in Solids	3.0
MATE 351	Electronic and Photonic Properties of Materials	4.0
	Term Credits	15.5

Term 10

CHE 350	Statistics and Design of Experiments	3.0
MATE 366 [WI]	Processing of Metallic Materials	4.5
MATE 455	Biomedical Materials	3.0
MATE 460	Engineering Computational Laboratory	4.0
MATE 491 [WI]	Senior Project Design I	2.0
	Term Credits	16.5

Term 11

MATE 345	Processing of Ceramics	4.5
MATE 492	Senior Project Design II	3.0
Technical Elective/Track Course		3.0
General Education Elective		3.0
	Term Credits	13.5

Term 12

CHEC 353	Physical Chemistry and Applications III	4.0
MATE 410	Case Studies in Materials	3.0

MATE 493 [WI]	Senior Project Design III	3.0
Technical Elective/Track Course		3.0
	Term Credits	13.0

Total Credit: 185.5

Co-op/Career Opportunities

Examples of industries in which materials science and engineering graduates play major roles include: base metals industries; specialist alloys; advanced ceramics; petrochemical; biomaterials and implants; pharmaceuticals; consumer products; electronics and photonics; nanotechnology; power generation; energy conversion, storage and conservation (fuel cells, advanced batteries, supercapacitors and photovoltaics); environmental protection and remediation; information and telecommunications; and transportation (aerospace, automotive, bicycles, railways).

Typical job functions include design and development of new materials, materials selection for specific applications, manufacturing, performance and failure analysis, quality control and testing, research and development, technical management, sales and marketing, teaching, technical services, and technical writing.

Please visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) for more detailed information on co-op and post-graduate opportunities.

Dual/Accelerated Degree

Accelerated Degree Program

The Accelerated Degree Program within the College of Engineering provides opportunities for highly talented and motivated students to progress toward their educational goals essentially at their own pace. These options include opportunities for accelerated studies, dual degrees, as well as a combined bachelor's/master's (BS/MS) program. Primarily through advance placement, credit by examination, flexibility of scheduling, and independent study, this "fast-track" makes it possible to complete both the undergraduate curriculum and Master's level graduate studies in the five years required by the standard curriculum.

Dual Degree Bachelor's Programs

With careful planning, students can complete two full degrees in the time usually required to complete one. For detailed information, students should contact their advisors.

Bachelor's/Master's Dual Degree Program

Exceptional students can also pursue a master of science (MS) degree in the same period as the bachelor of science (BS). The combined BS/MS degree in Materials Science and Engineering differs from the standard BS degree in that there are two six-month Co-op periods instead of three, and in the last two years, the necessary graduate courses are taken.

For more information about this program, please visit the Department's BS/MS Dual Degree Program (http://www.drexel.edu/materials/academics/undergrad/bs-ms/) page.

Facilities

Biomaterials and Biosurfaces Laboratory
This laboratory contains 10 kN biaxial and 5 kN uniaxial servo-hydraulic mechanical testing machines, a Fluoroscan X-ray system, a microscopic imaging system, a spectra-fluorometer, a table autoclave, centrifuge, vacuum oven, CO_2 incubators, biological safety cabinet, thermostatic water baths, precision balance and ultrasonic sterilizer.

Nanobiomaterials and Cell Engineering Laboratory
This laboratory contains a fume hood with vacuum/gas dual manifold, vacuum pump and rotary evaporator for general organic/polymer synthesis; gel electrophoresis and electroblotting for protein characterization; bath sonicator, glass homogenizer and mini-extruder for nanoparticle preparation; centrifuge; ultrapure water conditioning system; precision balance; pH meter and shaker.

Ceramics Processing Laboratory
This laboratory contains a photo-resist spinner, impedance analyzer, Zeta potential meter, spectrafluorometer, piezoelectric d33 meter, wire-bonder, and laser displacement meter.

Dynamic Characterization Laboratory
This laboratory contains metallographic sample preparation (sectioning, mounting and polishing) facilities; inverted metallograph; microhardness tester; automated electropolishing for bulk and TEM sample preparation; SEM tensile stage for EBSD; Magneto-Optical Kerr Effect (MOKE) magnetometer.

MAX/MXene Ceramics Laboratory
This laboratory contains a vacuum hot-press; a hot isostatic press (HIP) for materials consolidation and synthesis; laser scattering particle size analyzer; creep testers, Ar-filled glove-box, high-speed saw, and assorted high temperature furnaces; metallographic preparation facilities; high temperature closed-loop servo-hydraulic testing machines.

Mechanical Testing Laboratory
This laboratory contains mechanical and closed-loop servo-hydraulic testing machines, hardness testers, Charpy and Izod impact testers, equipment for fatigue testing, metallographic preparation facilities and a rolling mill with twin 6" diameter rolls.

Mesoscale Materials Laboratory
This laboratory contains instrumentation for growth, characterization, device fabrication, and design and simulation of electronic, dielectric, ferroelectric and photonic materials. Resources include physical and chemical vapor deposition and thermal and plasma processing of thin films, including oxides and metals, and semiconductor nanowire growth. Facilities include pulsed laser deposition, atomic layer deposition, chemical vapor deposition, sublimation growth, and resistive thermal evaporation. Variable-temperature high-vacuum probe station and optical cryostats including high magnetic field, fixed and tunable-wavelength laser sources, several monochromators for luminescence and Raman scattering spectroscopy, scanning electron microscopy with electron beam lithography, and a scanning probe microscope.

Nanomaterials Laboratory
This laboratory contains instrumentation for synthesizing, testing and manipulation of nanomaterials carbon and two dimensional carbides under microscope, high-temperature autoclaves, Sievert's apparatus; glove-boxes; high-temperature vacuum and other furnaces for the synthesis of nano-carbon coatings and nanotubes; tube furnaces for synthesis of carbides and nitrides; potentiostat/galvanostat for electrochemical testings; ultraviolet-visible (UV-VIS) spectrophotometry; Raman spectrometers; Differential scanning calorimeter (DSC) and thermogravimetric analyzer (TGA) up to 1500 $^{\circ}$C with mass spectrometer, Zeta potential analyzer; attrition mill, bath and probe sonicators, centrifuges; electro-spinning system for producing nano-fibers.

Oxide Films and Interfaces Laboratory
This laboratory contains an oxide molecular beam epitaxy (MBE) thin film deposition system; physical properties measurement system (PPMS) for electronic transport and magnetometry measurements from 2 – 400K, up to 9 T fields; 2 tube furnaces.

Powder Processing Laboratory
This laboratory contains vee blenders, ball-mills, sieve shaker + sieves for powder classification, several furnaces (including one with controlled atmosphere capability); and a 60-ton Baldwin cold press for powder compaction.

Soft Matter Research and Polymer Processing Laboratories
These laboratories contain computerized thermal analysis facilities including differential scanning calorimeters (DSC), dynamic mechanical analyzer (DMA) and thermo-gravimetric analyzer (TGA); tabletop tensile tester; strip biaxial tensile tester; vacuum evaporator; spin coater; centrifuge; optical microscope with hot stage; liquid crystal tester; microbalance; ultrasonic cleaner; laser holographic fabrication system; polymer injection molder and single screw extruder.

Natural Polymers and Photonics Laboratory
This laboratory contains a spectroscopic ellipsometer for film characterization; high purity liquid chromatography (HPLC) system; refractometer; electro-spinning systems for producing nano-fibers.

X-ray Tomography Laboratory
This laboratory contains a high resolution X-ray micro-tomography instrument and a cluster of computers for 3D microstructure reconstruction; mechanical stage, a positioning stage and a cryostage for *in-situ* testing. For more information on departmental facilities, please visit the Department's Facilities web page (http://www.materials.drexel.edu/research/facilities/).

Centralized Research Facilities
The Department of Materials Science & Engineering relies on Core Facilities within the University for materials characterization and micro- and nano-fabrication. These facilities contain a number of state-of-the-art materials characterization instruments, including environmental and variable pressure field-emission scanning electron microscopes (SEMs) with Energy Dispersive Spectroscopy (EDS) for elemental analysis, and Orientation Image Microscopy (OIM) for texture analysis; a Transmission Electron Microscope (TEM) with STEM capability and TEM sample preparation equipment; a dual-beam focused ion beam (FIB) system for nano-characterization and nano fabrication; a femtosecond/terahertz laser Raman spectrometer; visible and ultraviolet Raman micro spectrometers with a total of 7 excitation wavelengths for non-destructive chemical and structural analysis and Surface Enhanced Raman (SERS); a Fourier Transform Infrared (FTIR) spectrometer with a microscope and full array of accessories; a Nanoindenter; an X-ray Photoelectron Spectrometer (XPS)/Electron Spectroscopy for Chemical Analysis (ESCA) system; and X-Ray Diffractometers (XRD), including small angle/wide angle X-Ray scattering (SAX/WAX).

More details of these instruments, information how to access them and instrument usage rates can be found at Drexel University's Centralized Research Facilities (http://crf.coe.drexel.edu/) web page.

Materials Science and Engineering Faculty

Michel Barsoum, PhD *(Massachusetts Institute of Technology)*. Distinguished Professor. Processing and characterization of novel ceramics and ternary compounds, especially the MAX and 2-D MXene phases.

Hao Cheng, PhD *(Northwestern University)*. Associate Professor. Drug delivery, molecular self-assembly, cell-nanomaterial interactions, regenerative medicine and cell membrane engineering.

Yury Gogotsi, PhD *(Kiev Polytechnic Institute) Director, A. J. Drexel Nanotechnology Institute*. Distinguished University & Charles T. and Ruth M. Bach Professor. Nanomaterials; carbon nanotubes; nanodiamond; graphene; MXene; materials for energy storage, supercapacitors, and batteries.

Richard Knight, PhD *(Loughborough University) Associate Department Head and Undergraduate Advisor*. Teaching Professor. Thermal plasma technology; thermal spray coatings and education; plasma chemistry and synthesis.

Christopher Y. Li, PhD *(University of Akron)*. Professor. Soft and hybrid materials for optical, energy, and bio applications; polymeric materials, nanocomposites, structure and properties.

Andrew Magenau, PhD *(University of Southern Mississippi)*. Assistant Professor. Structurally complex materials exhibiting unique physical properties designed and fabricated using an assortment of methodologies involving directed self-assembly, externally applied stimuli, structure-function correlation, and applied engineering principles suited for technologies in regenerative medicine, biological interfacing, catalytic, electronic, and optical applications

Michele Marcolongo, PhD, PE *(University of Pennsylvania) Department Head, Materials Science and Engineering*. Professor. Orthopedic biomaterials; acellular regenerative medicine, biomimetic proteoglycans; hydrogels.

Steven May, PhD *(Northwestern University) Department Head*. Professor. Synthesis of complex oxide films, superlattices, and devices; materials for energy conversion and storage; magnetic and electronic materials; x-ray and neutron scattering.

Ekaterina Pomerantseva, PhD *(Moscow State University, Russia)*. Associate Professor. Solid state chemistry; electrochemical characterization, lithium-ion batteries, energy generation and storage; development and characterization of novel nanostructured materials, systems and architectures for batteries, supercapacitors and fuel cells.

Caroline L. Schauer, PhD *(SUNY Stony Brook) Associate Dean, Faculty Affairs College of Engineering*. Professor. Polysaccharide thin films and nanofibers.

Wei-Heng Shih, PhD *(Ohio State University)*. Professor. Colloidal ceramics and sol-gel processing; piezoelectric biosensors, optoelectronics, and energy harvesting devices; nanocrystalline quantum dots for bioimaging, lighting, and solar cells.

Jonathan E. Spanier, PhD *(Columbia University) Department Head, Mechanical Engineering and Mechanics*. Professor. Light-matter interactions in electronic materials, including ferroelectric semiconductors, complex oxide thin film science; laser spectroscopy, including Raman scattering.

Mitra Taheri, PhD *(Carnegie Mellon University) Hoeganeas Professor of Metallurgy*. Professor. Development of the ultrafast Dynamic Transmission Electron Microscope (DTEM) for the study of laser-induced microstructural evolution/phase transformations in nanostructured

materials; use of various in-situ Transmission Electron Microscopy techniques.

Jörn Venderbos, PhD *(Leiden University)*. Assistant Professor. Theory of quantum materials: topological Insulators, topological semimetals, materials prediction and design, strongly correlated electron materials, complex electronic ordering phenomena, unconventional superconductors

Christopher Weyant, PhD *(Northwestern University)*. Teaching Professor. Engineering education

Antonios Zavaliangos, PhD *(Massachusetts Institute of Technology) A.W. Grosvenor Professor*. Professor. Constitutive modeling; powder compaction and sintering; pharmaceutical tableting, X-ray tomography.

Emeritus Faculty

Roger D. Corneliussen, PhD *(University of Chicago)*. Professor Emeritus. Fracture, blends and alloys, as well as compounding.

Roger D. Doherty, PhD *(Oxford University)*. Professor Emeritus. Metallurgical processing; thermo-mechanical treatment.

Ihab L. Kamel, PhD *(University of Maryland)*. Professor Emeritus. Nanotechnology, polymers, composites, biomedical applications, and materials-induced changes through plasma and high energy radiation.

Jack Keverian, PhD *(Massachusetts Institute of Technology)*. Professor Emeritus. Rapid parts manufacturing, computer integrated manufacturing systems, strip production systems, technical and/or economic modeling, melting and casting systems, recycling systems.

Mechanical Engineering

Major: Mechanical Engineering
Degree Awarded: Bachelor of Science in Mechanical Engineering (BSME)
Calendar Type: Quarter
Total Credit Hours: 188.5
Co-op Options: Three Co-op (Five years); One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 14.1901
Standard Occupational Classification (SOC) code: 17-2141

About the Program

The role of the mechanical engineer in today's society is rapidly changing. Advances in manufacturing, transportation, infrastructure systems, materials, communications, and high-performance computing have introduced new demands, opportunities, and challenges for mechanical engineers. What was once an individual endeavor has now become a team activity. Today's industries require that mechanical engineers possess diverse interdisciplinary skills, a global viewpoint, entrepreneurial and managerial abilities, and an understanding of the forces governing the marketplace.

Traditionally, mechanical engineers have been associated with industries like automotive, transportation, and power generation, and with activities involving the design, analysis, and manufacturing of products useful to society. While today such activities are still dominated by mechanical engineers, the spectrum of opportunities for these professionals has expanded tremendously. For example, mechanical engineers are involved in the design and analysis of biomedical instrumentation, electronic components, smart structures, and advanced materials; they are involved in sophisticated studies of human motion, control of satellites, and the development of more efficient energy-transfer techniques.

Drexel's Department of Mechanical Engineering and Mechanics (https://drexel.edu/engineering/academics/departments/mechanical-engineering/) (MEM) prides itself on providing its students with a comprehensive program of courses, laboratories, design projects, and co-op experiences. The MEM curriculum is designed to balance technical breadth (provided by a set of fundamental required core courses) with technical depth (provided by optional concentrations that emphasize particular fields within the profession). Thus, the MEM program not only prepares its graduates to become successful mechanical engineers needed in industry and government, but also provides an excellent springboard to pursue graduate studies in medical sciences, law, business, information technology, and any other disciplines where technological and analytical skills play an important role.

Mission Statement

The mission of the Department of Mechanical Engineering and Mechanics of Drexel University is to transfer and acquire knowledge through: (a) the education of engineers for leadership in industry, business, academia, and government; and (b) the establishment of internationally recognized research programs. This mission is accomplished by the delivery of an outstanding curriculum, by the participation of our students in one of the nation's most prestigious co-operative educational programs, and by the scholarly activities of the faculty.

Program Educational Objectives

- Our graduates will be successful in careers that deal with the design, simulation and analysis of engineering systems, experimentation and testing, manufacturing, technical services, and research.
- Our graduates will enter and complete academic and professional programs in engineering, business, management, law and medicine.
- Our graduates will communicate effectively with peers and be successful working with and leading multi-disciplinary and multi-cultural teams.
- Our graduates will recognize the global, legal, societal, and ethical contexts of their work.
- Our graduates will advance in their careers; for example, assuming increasing levels of responsibility and acquiring professional licensure.

Student Outcomes

The department's student outcomes reflect the skills and abilities that the curriculum is designed to provide to students by the time they graduate. These are:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Additional Information

The Mechanical Engineering and Mechanics program is accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org).

For additional information about this major, contact the MEM Department (http://drexel.edu/mem/).

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

The mechanical engineering and mechanics curriculum is designed to balance technical breadth (provided by a set of fundamental required core courses) with technical depth (provided by optional concentrations that emphasize particular fields within the profession).

General Education/Liberal Studies Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
HIST 285	Technology in Historical Perspective	4.0
PHIL 315	Engineering Ethics	3.0
UNIV E101	The Drexel Experience	1.0
General Education Requirements [*]		12.0

Mathematics Requirements

MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 200	Multivariate Calculus	4.0
MATH 201	Linear Algebra	4.0
MATH 210	Differential Equations	4.0

Physics Requirements

PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
PHYS 201	Fundamentals of Physics III	4.0

Chemistry/Biology Requirements

BIO 141	Essential Biology	4.5
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5

Engineering Design Requirements

ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
ENGR 113	First-Year Engineering Design	3.0
ENGR 131	Introductory Programming for Engineers	3.0
or ENGR 132	Programming for Engineers	

Engineering Requirements

ENGR 210	Introduction to Thermodynamics	3.0

Engineering Economics Requirements

CIVE 240 [WI]	Engineering Economic Analysis	3.0

Materials Requirements

ENGR 220	Fundamentals of Materials	4.0

Mechanical Requirements

MEM 201	Foundations of Computer Aided Design	3.0
MEM 202	Statics	3.0
MEM 220	Fluid Mechanics I	4.0
MEM 230	Mechanics of Materials I	4.0
MEM 238	Dynamics	4.0
MEM 255	Introduction to Controls	4.0
MEM 310	Thermodynamic Analysis I	4.0
MEM 311	Thermal Fluid Science Laboratory	2.0
MEM 331	Experimental Mechanics I	2.0
MEM 351	Dynamic Systems Laboratory I	2.0
MEM 333	Mechanical Behavior of Materials	3.0
MEM 345	Heat Transfer	4.0
MEM 355	Performance Enhancement of Dynamic Systems	4.0
MEM 361	Engineering Reliability	3.0
MEM 391	Introduction to Engineering Design Methods	1.0
MEM 435	Introduction to Computer-Aided Design and Manufacturing	4.0
MEM 491 [WI]	Senior Design Project I	2.0
MEM 492 [WI]	Senior Design Project II	3.0
MEM 493 [WI]	Senior Design Project III	3.0
MEM Fundamental Courses. Select four of the following:		12.0-16.0
MEM 320	Fluid Dynamics I	
MEM 330	Mechanics of Materials II	
MEM 410	Thermodynamic Analysis II	
MEM 417	Introduction to Microfabrication	
MEM 423	Mechanics of Vibration	
MEM 431	Machine Design I	
MEM 437	Manufacturing Process I	
MEM 440	Thermal Systems Design	
MEM 458	Micro-Based Control Systems I	
MEM 459	Control Applications of DSP Microprocessors	
MEM Open Electives (Any two MEM courses 300 level or higher.)		6.0-8.0
COE Electives (Any 2 College of Engineering courses, including MEM courses, 300 level or higher.)		6.0-8.0
Math/Science Electives (300+ level MATH, PHYS, BIO, CHEM, CHEC, and ENVS.)		6.0-8.0
Free Electives		6.0-8.0

Electives or Optional Concentration [**]

Aerospace Concentration

Select five courses (15.0 credits) from the list below:

MEM 320	Fluid Dynamics I	
MEM 330	Mechanics of Materials II	
MEM 373	Space Systems Engineering I	
MEM 374	Space Systems Engineering II	
MEM 403	Gas Turbines & Jet Propulsion	
MEM 405	Principles of Combustion I	
MEM 406	Principles of Combustion II	
MEM 420	Aerodynamics	
MEM 423	Mechanics of Vibration	
MEM 425	Aircraft Design & Performance	
MEM 426	Aerospace Structures	
MEM 427	Finite Element Methods	
MEM 428	Introduction to Composites I	
MEM 429	Introduction to Composites II	
MEM 451	Orbital Mechanics	
MEM 453	Aircraft Flight Dynamics & Control I	
MEM 454	Aircarft Flight Dynamics & Control II	
MEM 455	Introduction to Robotics	
MEM 459	Control Applications of DSP Microprocessors	

Energy Concentration

Select five courses (15.0 credits) from the list below:

AE 430	Control Systems for HVAC	
CHE 431	Fundamentals of Solar Cells	
ECEP 354	Energy Management Principles	
ECEP 371	Introduction to Nuclear Engineering	
ECEP 380	Introduction to Renewable Energy	
ECEP 402	Theory of Nuclear Reactors	
ECEP 403	Nuclear Power Plant Design & Operation	
ECEP 406	Introduction to Radiation Health Principles	
ECEP 411	Power Systems I	
ECEP 422	Power Distribution Automation and Control	
ECEP 480	Solar Energy Engineering	
MEM 320	Fluid Dynamics I	
MEM 330	Mechanics of Materials II	
MEM 371	Introduction to Nuclear Engineering I	
MEM 400	Internal Combustion Engines	
MEM 402	Power Plant Design	
MEM 403	Gas Turbines & Jet Propulsion	
MEM 405 & MEM 406	Principles of Combustion I and Principles of Combustion II	
MEM 410	Thermodynamic Analysis II	
MEM 413 & MEM 414	HVAC Loads and HVAC Equipment	
MEM 415	Fuel Cell Engines	
MEM 445	Solar Energy Fundamentals	
MEM 446 & MEM 447	Fundamentals of Plasmas I and Fundamentals of Plasmas II	
MEM 448	Applications of Thermal Plasmas	
MEM 449	Applications of Non-Thermal Plasmas	
Total Credits		188.5-200.5

*   General Education Requirements (p. 215).

**   Students may choose to do a concentration in either Aerospace or Energy. Concentrations consist of 15.0 concentration credits.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms

before their co-op begins. As of September 2020, COOP 101 will be one credit.

5 YR UG Co-op Concentration

Term 1		Credits
CHEM 101	General Chemistry I	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
MATH 121	Calculus I	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	14.5
Term 2		
CHEM 102	General Chemistry II	4.5
COOP 001	Co-op Essentials	0.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
ENGR 131 or 132	Introductory Programming for Engineers Programming for Engineers	3.0
MATH 122	Calculus II	4.0
PHYS 101	Fundamentals of Physics I	4.0
	Term Credits	18.5
Term 3		
BIO 141	Essential Biology	4.5
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
ENGR 113	First-Year Engineering Design	3.0
MATH 200	Multivariate Calculus	4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	18.5
Term 4		
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 220	Fundamentals of Materials	4.0
MATH 201	Linear Algebra	4.0
MEM 202	Statics	3.0
PHYS 201	Fundamentals of Physics III	4.0
	Term Credits	16.0
Term 5		
ENGR 210	Introduction to Thermodynamics	3.0
MATH 210	Differential Equations	4.0
MEM 201	Foundations of Computer Aided Design	3.0
MEM 238	Dynamics	4.0
General Education elective		3.0
	Term Credits	17.0
Term 6		
CIVE 240 [WI]	Engineering Economic Analysis	3.0
HIST 285	Technology in Historical Perspective	4.0
MEM 230	Mechanics of Materials I	4.0
MEM 310	Thermodynamic Analysis I	4.0
Free elective		3.0
	Term Credits	18.0
Term 7		
MEM 220	Fluid Mechanics I	4.0
MEM 255	Introduction to Controls	4.0
MEM 331	Experimental Mechanics I	2.0
MEM 333	Mechanical Behavior of Materials	3.0
PHIL 315	Engineering Ethics	3.0
	Term Credits	16.0
Term 8		
MEM 311	Thermal Fluid Science Laboratory	2.0
MEM 355	Performance Enhancement of Dynamic Systems	4.0

MEM 345	Heat Transfer	4.0
MEM 391	Introduction to Engineering Design Methods	1.0
MEM 435	Introduction to Computer-Aided Design and Manufacturing	4.0
MEM Fundamentals Course[*]		3.0
	Term Credits	18.0
Term 9		
MEM 351	Dynamic Systems Laboratory I	2.0
MEM 361	Engineering Reliability	3.0
Two MEM Fundamentals Courses[*]		6.0
General Education Elective[*]		3.0
	Term Credits	14.0
Term 10		
MEM 491 [WI]	Senior Design Project I	2.0
General Education Elective[*]		3.0
A MEM or College of Engineering Elective (300+)		3.0
MEM Fundamentals Course[*]		3.0
Math/Science Course[*]		3.0
	Term Credits	14.0
Term 11		
MEM 492 [WI]	Senior Design Project II	3.0
Any 300-level or Higher MEM Elective		3.0
A MEM or College of Engineering Elective (300+)		3.0
Math/Science Course[*]		3.0
	Term Credits	12.0
Term 12		
MEM 493 [WI]	Senior Design Project III	3.0
Free Electives		3.0
Any 300-level or Higher MEM Elective		3.0
General Education Elective[*]		3.0
	Term Credits	12.0

Total Credit: 188.5

[*]   See degree requirements (p. 272).

Co-op/Career Opportunities

Mechanical engineers are employed in a growing number of areas, including aerospace, automotive, biomechanics, computer systems, electronic entertainment, energy, environmental, health care, manufacturing, nuclear technology, and utilities.

Most mechanical engineering graduates begin full-time employment immediately upon graduation. However, there are a number of graduates who go on to pursue master's and/or doctoral degrees in mechanical engineering. The graduate schools that Drexel's mechanical engineers have attended include Harvard, UC Berkeley, and the University of Pennsylvania.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) for more detailed information on co-op and post-graduate opportunities.

Dual/Accelerated Degree

Accelerated Program

The Accelerated Program of the College of Engineering provides opportunities for highly talented and strongly motivated students to progress toward their educational goals essentially at their own pace. These options include opportunities for accelerated studies, dual degrees, a combined bachelor's/master's program as well as participation in the University Honors Program (http://www.drexel.edu/honors/).

Primarily through advanced placement, credit by examination, flexibility of scheduling, and independent study, the "fast track" makes it possible to complete the undergraduate curriculum and initiate graduate study in less than the five years required by the standard curriculum.

Dual Degree Bachelor's Programs

With careful planning, you can complete two full degrees in the time usually required to complete one. The double major option works best in closely related areas. For detailed information please contact your advisor.

Bachelor's/Master's (BS/MS) Dual Degree Program

Exceptional students can also pursue a master of science degree in the same period as the bachelor of science. For MEM undergraduate students, the following are the possible graduate programs for the Master's degree in the BS/MS dual degree program:

- Electrical Engineering
- Computer Engineering
- Material Science Engineering
- Mechanical Engineering and Mechanics
- Biomedical Engineering
- Chemical Engineering

High achieving students have the opportunity to apply for the BS/MS program which allows students to complete both a Bachelor's and a Master's in Mechanical Engineering in a 5-year period. Entering students can indicate their interest in this program on their application but must formally apply, be qualified and be accepted into the program after earning 90.0 quarter credits and before reaching 120.0 quarter credits. The threshold requirements to be evaluated for acceptance into the program are:

- Have a minimum 3.30 GPA in all courses completed at Drexel University at time of application.
- Have a minimum of 3.50 GPA in the following seven courses (or their equivalent): *Introduction to Thermodynamics* (ENGR 210); *Fundamentals of Materials* (ENGR 220); *Linear Engineering Systems* (ENGR 231); *Dynamic Engineering Systems* (ENGR 232); *Foundations of Computer Aided Design* (MEM 201); *Statistics* (MEM 202); and *Dynamics* (MEM 238).

Students in the 5COP accelerated program will progress according to the program plan established for the 5-year with co-op undergraduate (or 5COP) program and maintain undergraduate status throughout. The 5COP program includes three 6-month cooperative education cycles.

The College of Engineering offers additional information about the BS/MS program (http://drexel.edu/engineering/programs/undergraduate/accelerated-programs/) on its website.

Facilities

Instructional Laboratories

Mechanical Engineering and Mechanics (MEM) supports instructional laboratories to provide hands-on experience with engineering measurements and to augment classroom instruction in the areas of mechanics, systems and controls, thermal fluid sciences and design and

manufacturing along with a college-supported machine shop to aid senior design.

Specialized Laboratories

BIOMEMS Lab and Lab-on-a-Chip

Develops miniature devices for biological and medical applications using microfabrication and microfluidics technologies. Our research projects are highly multidisciplinary in nature and thus require the integration of engineering, science, biology, and medicine. Projects are conducted in close collaboration with biologists and medical doctors. Our research methodology includes design and fabrication of miniature devices, experimental characterization, theoretical analysis and numerical simulation.

Computer-aided Design Lab (CAD)

Provides access to software such as AutoCAD, ANSYS, Abagus, CREO, and SOLIDWORKS either in the 42 workstation lab which is available by card access 24/7, or over any network connection using our CITRIX server. Computations are performed on a virtual pc running at the server, and students can use any smart device for input and display.

Theoretical and Applied Mechanics Group Laboratory (TAMG)

Through experimental, analytical, and computational investigations, TAMG develops insights into the deformation and failure of materials, components and structures in a broad range of time and length scales. To accomplish this goal, TAMG develops procedures that include mechanical behavior characterization coupled with non-destructive testing and modern computational tools. This information is used both for understanding the role of important material scales in the observed bulk behavior and for the formation of laws that can model the response to prescribed loading conditions.

Electrochemical Energy Systems Laboratory (ECSL)

Addresses the research and development needs of emerging alternative energy technologies. ECSL specializes in the design, diagnostics, and characterization of next-generation electrochemical energy conversion and storage systems; particularly fuel cell and battery technology. Current areas of research include polymer electrolyte fuel cells for stationary, portable, and transportation areas of next-generation flow battery technology for intermittent energy storage, load leveling and smart-grid applications. ECSL uses a comprehensive approach, including advanced diagnostics, system design, materials characterization, and computational modeling of electrochemical energy systems.

Dynamic Multifunctional Materials Laboratory (DMML)

Investigates material and/or structural behavior across 10 orders of magnitude in strain rate with temperature and electrical coupling capabilities. The DMML is equipped with novel experimental apparatus designed in house, and a wide range of full-field optical diagnostics, 2W Coherent laser and white light illumination and ultra high-speed imaging (5 Mfps).

Some of the major equipment in DMML includes a two-stage light gas gun for hypervelocity impact (*USPTO patent pending*), a modular single-stage gas gun with blast tube capability, a novel impact fatigue device (*USPTO patent pending*), compression Kolsky (split-Hopkinson) bar system in both steel for high-impedance material testing and polycarbonate for soft material characterization, a miniature tension/torsion Kolsky, a standard material load frame, optical microscopes and a wide range of

optomechanics and lens systems. DMML also has a complete material preparation setup including a diamond saw, an Allied High Tech Multiprep material polishing system, a precision microbalance, charge amplifiers, oscilloscopes, hot plates, and high performance computer workstations with Abagus, MatchID DIC software, AutoCAD/Creo, and MATLAB.

Multiscale Thermofluidics Lab

Develops novel scalable nanomanufacturing techniques using biological templates to manipulate micro- and nano-scale thermal and fluidic phenomena. Current work includes enhancing phase-change heat transfer with super-wetting nanostructured coatings and transport and separation through nanoporous membranes.

Vascular Kinetics Laboratory

Utilizes engineering methods to reveal the intricacies of vascular biology and thereby discover new ways to treat human disease. In particular, the interaction of cardiovascular cells and how their extracellular matrix is altered in diabetic hyperglycemia is studied. These discoveries are applied to novel biomaterial and drug development.

The research in the laboratory spans biochemistry, biomechanics, and vascular biology. The work is at the interface of engineering and medicine, celebrating the inherent interdisciplinary nature of biomedical engineering with a strong emphasis on clinical applications.

Biofabrication Laboratory

Utilizes cells or biologics as basic building blocks in which biological models, systems devices and products are manufactured. Biofabrication techniques encompass a broad range of physical, chemical, biological, and/or engineering process, with various applications in tissue science and engineering, regenerative medicine, disease pathogeneses and drug testing studies, biochips and biosensors, cell printing, patterning and assembly, and organ printing.

The Program for Biofabrication at Drexel integrates computer-aided tissue engineering, modern design and manufacturing, biomaterials and biology in modeling, design, and biofabrication of tissue scaffolds, tissue constructs, micro-organ, tissue models. The ongoing research focuses on bio-tissue modeling, bio-blueprint modeling, scaffold informatics modeling, biometric design of tissue scaffold, additive manufacturing of tissue scaffolds, cell printing and organ printing.

The facilities at the Biofabrication Laboratory include:

- state-of-the-art computer-aided design/engineering/manufacturing (CAD/CAE/CAM) software, medical image processing and 3D reconstruction software, and in-house developed heterogeneous modeling and homogenization software
- proprietary multi-nozzle cell deposition system for direct cell writing and construction of tissue precursors and micro-organs
- proprietary precision extruding deposition system for fabrication of 3D bipolymer tissue scaffolds
- commercial available 3DP free-form fabrication system for bio-physical modeling
- plasma instrument for surface treatment and surface functionalization
- MTS universal testing system
- laboratory for cell and tissue culture study

Complex Fluids and Multiphase Transport Lab

Conducts both experimental and modeling studies on heat/mass transfer and multi-phase flows, as well as transport phenomena in additive manufacturing and energy systems. Current projects range from basic studies in interfacial transport in directed-assembly of functional materials and nanostructure-enhanced two-phase heat transfer to design of innovative dry cooling power plants and electrochemical energy storage systems.

Laboratory for Biological Systems Analysis

Applies system level engineering techniques to biological systems with emphasis on:

- The development of bio-robotic models as tools for investigating hypotheses about biological systems
- The use of system identification techniques to evaluate the functional performance of physiological systems under natural behavioral conditions
- The design of systems that are derived from nature and use novel techniques, such as electro-active polymers, to achieve superior performance and function

Advanced Design and Manufacturing Laboratory **(**http:// www.mem.drexel.edu/current/labs/?m=research&a=lab_desc&labID=6**)** This laboratory provides research opportunities in design methodology, computer-aided design, analysis and manufacturing, and materials processing and manufacturing. Facilities include various computers and software, I-DEAS, Pro/E,ANSYS, MasterCAM, Mechanical DeskTop, SurfCAM, Euclid, Strim, ABQUS, and more. The machines include two Sanders Model Maker rapid prototyping machines, a BridgePort CNC Machining Center, a BOY 220 injection molding machine, an Electra high-temperature furnace for metal sintering, infiltration, and other heat treatment.

Biomechanics Laboratory **(**http://www.mem.drexel.edu/current/labs/? m=research&a=lab_desc&labID=2**)** Emphasis in this laboratory is placed on experimental modelling studies of the mechanical properties of human joints, characterization of the mechanical properties of biological materials, studies of human movements, and design and development of joint replacements with particular emphasis on total ankle replacement. Facilities include a 3-D kinematic measuring system, Tensile testing machine, joint flexibility testers, and microcomputers for data acquisition and processing.

Combustion and Fuels Chemistry Laboratory **(**http://www.mem.drexel.edu/ current/labs/?m=research&a=lab_desc&labID=1**)** Investigate chemical and physical factors that control and, hence, can be used to tailor combustion processes for engineering applications. Facilities include continuous spectroscopic reaction monitoring systems, static reactors, combustion bombs, flat flame burner systems, flow reactors, and complete analytical and monitoring instrumentation.

Research is conducted in the areas of (1) low temperature hydrocarbon oxidation, (2) cool flames, (3) auto-ignition, (4) flame instabilities, (5) flame structure, (6) flame ignition, and (7) flame extinction (quelching). New ways to improve fuel efficiency in practical combustors and recover waste energy in the transportation sector are also being explored.

Composite Mechanics Laboratory
Emphasis in this laboratory is placed on the characterization of performance of composite materials. Current interest includes damage mechanisms, failure processes, and time-dependent behavior in resin-, metal-, and ceramic-matrix composites. Major equipment includes servo-hydraulic and electromechanical Instron testing machines,

strain/displacement monitoring systems, environmental chambers, microcomputers for data acquisition and processing, composites fabrication facility, interferometric displacement gauge, X-radiography, and acoustic emission systems.

Nyheim Plasma Institute (Formerly A.J. Drexel Plasma Institute) **(**http:// www.mem.drexel.edu/current/labs/?m=research&a=lab_desc&labID=11**)** The Nyheim Plasma Institute was formed in 2002 to stimulate and coordinate research projects related to plasma and other modern high energy engineering techniques. Today the institute is an active multidisciplinary organization involving 23 faculty members from 6 engineering departments working in close collaboration with School of Biomedical Engineering, College of Arts and Sciences and College of Nursing and Health Professions.

Heat Transfer Laboratory
The heat transfer laboratory is outfitted with an array of instrumentation and equipment for conducting single- and multiphase heat transfer experiments in controlled environments. Present efforts are exploring the heat and mass transfer process in super-critical fluids and finary refrigerants.

Precision Instrumentation and Metrology Laboratory **(**http:// www.mem.drexel.edu/current/labs/?m=research&a=lab_desc&labID=7**)** This laboratory is focused on activities related to precision measurement, computer-aided inspection, and precision instrument design. Facilities include 3D Coordinate Measuring Machine (Brown & Sharpe) with Micro Measurement and Reverse engineering software, Surface Profilometer, and Laser Displacement Measuring System.

Mechanical Engineering Faculty

Jennifer Atchison, PhD *(Drexel University)*. Assistant Teaching Professor. Engineering Education, Functional Fabrics, and Nanofibers

Jonathan Awerbuch, DSc *(Technion, Israel Institute of Technology)*. Professor. Mechanics of composites; fracture and fatigue; impact and wave propagation; structural dynamics.

Nicholas P. Cernansky, PhD *(University of California-Berkeley) Hess Chair Professor of Combustion*. Professor. Combustion chemistry and kinetics; combustion generated pollution; utilization of alternative and synthetic fuels.

Bor-Chin Chang, PhD *(Rice University)*. Professor. Computer-aided design of multivariable control systems; robust and optimal control systems.

Richard Chiou, PhD *(Georgia Institute of Technology)*. Associate Professor. Green manufacturing, mechatronics, Internet-based robotics and automation, and remote sensors and monitoring.

Young I. Cho, PhD *(University of Illinois-Chicago)*. Professor. Heat transfer; fluid mechanics; non-Newtonian flows; biofluid mechanics; rheology.

Bakhtier Farouk, PhD *(University of Delaware) Billings Professor of Mechanical Engineering*. Professor. Heat transfer; combustion; numerical methods; turbulence modeling; materials processing.

Alexander Fridman, DSc, PhD *(Moscow Institute of Physics and Technology) Mechanical Engineering and Mechanics, John A. Nyheim Endowed University Chair Professor, Director of the Drexel Plasma*

Institute. Professor. Plasma science and technology; pollutant mitigation; super-adiabatic combustion; nanotechnology and manufacturing.

Li-Hsin Han, PhD *(University of Texas at Austin)*. Assistant Professor. Polymeric, micro/nano-fabrication, biomaterial design, tissue engineering, rapid prototyping, free-form fabrication, polymer micro actuators, photonics

Y. Grace Hsuan, PhD *(Imperial College)*. Professor. Durability of polymeric construction materials; advanced construction materials; and performance of geosynthetics.

Andrei Jablokow, PhD *(University of Wisconsin, Madison) Associate Department Head for Undergraduate Affairs, Mechanical Engineering and Mechanics*. Associate Teaching Professor. Engineering education; kinematics; geometric modeling.

Antonios Kontsos, PhD *(Rice University)*. Associate Professor. Applied mechanics; probabilistic engineering mechanics; modeling of smart multifunctional materials.

E. Caglan Kumbur, PhD *(Pennsylvania State University)*. Associate Professor. Next generation energy technologies; fuel cell design and development.

Harry G. Kwatny, PhD *(University of Pennsylvania) S. Herbert Raynes Professor of Mechanical Engineering*. Professor. Dynamic systems analysis; stochastic optimal control; control of electric power plants and systems.

Alan Lau, PhD *(Massachusetts Institute of Technology)*. Professor. Deformation and fracture of nano-devices and macroscopic structures; damage-tolerant structures and microstructures.

Michele Marcolongo, PhD, PE *(University of Pennsylvania) Department Head, Materials Science and Engineering*. Professor. Orthopedic biomaterials; acellular regenerative medicine, biomimetic proteoglycans; hydrogels.

Roger Marino, PhD *(Drexel University)*. Associate Teaching Professor. Engineering education; land development; product Development

Matthew McCarthy, PhD *(Columbia University) Associate Department Head for Graduate Affairs, Mechanical Engineering and Mechanics*. Associate Professor. Micro- and nanoscale thermofluidic systems, bio-inspired cooling, smart materials and structures for self-regulated two-phase cooling, novel architectures for integrated energy conversion and storage.

David L. Miller, PhD *(Louisiana State University)*. Professor. Gas-phase reaction kinetics; thermodynamics; biofuels.

Moses Noh, PhD *(Georgia Institute of Technology)*. Associate Professor. MEMS; BioMEMS; lab-on-a-chip; microfabrication; microfluidics.

Mira S. Olson, PhD *(University of Virginia)*. Associate Professor. Peace engineering; source water quality protection and management; contaminant and bacterial fate and transport; community engagement.

Sorin Siegler, PhD *(Drexel University)*. Professor. Orthopedic biomechanics; robotics; dynamics and control of human motion; applied mechanics.

Jonathan E. Spanier, PhD *(Columbia University) Department Head, Mechanical Engineering and Mechanics*. Professor. Light-matter interactions in electronic materials, including ferroelectric semiconductors,

complex oxide thin film science; laser spectroscopy, including Raman scattering.

Wei Sun, PhD *(Drexel University) Albert Soffa Chair Professor of Mechanical Engineering*. Professor. Computer-aided tissue engineering; solid freeform fabrication; CAD/CAM; design and modeling of nanodevices.

Ying Sun, PhD *(University of Iowa)*. Associate Professor. Transport processes in multi-component systems with fluid flow; heat and mass transfer; phase change; pattern formation.

Tein-Min Tan, PhD *(Purdue University)*. Associate Professor. Mechanics of composites; computational mechanics and finite-elements methods; structural dynamics.

James Tangorra, PhD *(Massachusetts Institute of Technology) Department Head, Engineering Technology*. Associate Professor. Analysis of human and (other) animal physiological systems; head-neck dynamics and control; balance, vision, and the vestibular system; animal swimming and flight; robotics; system identification; bio-inspired design.

Ajmal Yousuff, PhD *(Purdue University)*. Associate Professor. Optimal control; flexible structures; model and control simplifications.

Jack G. Zhou, PhD *(New Jersey Institute of Technology)*. Professor. CAD/CAM; computer integrated manufacturing systems; rapid prototyping; system dynamics and automatic control.

Emeritus Faculty

Leon Y. Bahar, PhD *(Lehigh University)*. Professor Emeritus. Analytical methods in engineering, coupled thermoelasticity, interaction between analytical dynamics and control systems.

Gordon D. Moskowitz, PhD *(Princeton University)*. Professor Emeritus. Biomechanics, dynamics, design, applied mathematics.

Donald H. Thomas, PhD *(Case Institute of Technology)*. Professor Emeritus. Biocontrol theory, biomechanics, fluidics and fluid control, vehicle dynamics, engineering design.

Albert S. Wang, PhD *(University of Delaware)*. Professor Emeritus. Treatment of damage evolution processes in multi-phased high-temperature materials, including ceramics and ceramic-matrix composites.

Systems Engineering BS/MS

Major: Systems Engineering
Degree Awarded: Bachelor of Science (BS) AND Master of Science (MS)
Calendar Type: Quarter
Total Credit Hours: 228.0
Classification of Instructional Programs (CIP) code: 14.2701
Standard Occupational Classification (SOC) code: 17-2199

Note: **Currently and until further notice, the program will not be accepting applications to BS/MS with Systems Engineering.**

About the Program

The Master of Science in Systems Engineering is an online curriculum integrating systems and financial management and planning.The degree enables engineering leaders to perform, lead, and manage systems

development throughout the life cycle, from conceptual development and engineering design through the operation and sustainment phases.

Program Outcomes

Graduates of the Drexel University Master of Science in Systems Engineering will be competent in their ability to:

- develop and implement models and tools to enhance and optimize complex systems;
- develop and manage processes relevant to complex systems development;
- architect, design, implement, integrate, verify, validate, support and decommission complex systems;
- use systems engineering tools and practices to identify and execute effective technical solutions;
- manage system-intensive projects within cost and schedule constraints;
- consider financial elements in all complex systems solutions.

Degree Requirements

General Education/Liberal Studies Requirements

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PHIL 315	Engineering Ethics	3.0
UNIV E101	The Drexel Experience	2.0
General Education Courses		18.0

Foundation Requirements

BIO 141	Essential Biology	4.5
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
ECE 200	Digital Logic Design	4.0
ECE 201	Foundations of Electric Circuits I	4.0
ECE 203	Programming for Engineers	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
ENGR 113	First-Year Engineering Design	3.0
ENGR 131	Introductory Programming for Engineers	3.0
ENGR 220	Fundamentals of Materials	4.0
ENGR 231	Linear Engineering Systems	3.0
ENGR 232	Dynamic Engineering Systems	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 200	Multivariate Calculus	4.0
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
PHYS 201	Fundamentals of Physics III	4.0

Sophomore Engineering Elective Options

ENGR 210	Introduction to Thermodynamics	3.0
or MATH 221	Discrete Mathematics	

Professional Requirements

ECE 361	Probability and Data Analytics for Engineers	3.0-4.0
or ECE 362	Engineering Statistics	
ECE 391	Introduction to Engineering Design Methods	1.0
ECE 491 [WI]	Senior Design Project I	2.0
ECE 492 [WI]	Senior Design Project II	2.0

ECE 493	Senior Design Project III	4.0
ECEL 301 [WI]	Electrical Engineering Laboratory	2.0
ECEL 302	ECE Laboratory II	2.0
ECEL 303	ECE Laboratory III	2.0
ECEL 304	ECE Laboratory IV	2.0
ECES 301	Signals and Systems I	4.0
ECES 303	Signals and Systems II	3.0
ECE Electives		36.0
Math Elective		3.0
Free Electives		14.5
Required Graduate Courses		
EGMT 531	Engineering Economic Evaluation & Analysis	3.0
EGMT 572	Statistical Data Analysis	3.0
EGMT 573	Operations Research	3.0
EGMT 690	Systems Engineering Analysis II	
SYSE 510	Systems Engineering Process	3.0
SYSE 520	Global Sustainment and Integrated Logistics	3.0
SYSE 521	Integrated Risk Management	3.0
SYSE 533	Systems Integration and Test	3.0
SYSE 598	Capstone in Systems Engineering	3.0
SYSE 685	Systems Engineering Management	3.0
SYSE 688	Systems Engineering Analysis	3.0
Elective Graduate Courses (Choose 4)		**12.0**
SYSE 511	Systems Engineering Tools	
SYSE 522	Engineering Supply Chain Systems	
SYSE 523	Systems Reliability Engineering	
SYSE 524	Systems Reliability, Availability & Maintainability Analysis	
SYSE 525	Statistical Modeling & Experimental Design	
SYSE 530	Systems Engineering Design	
SYSE 531	Systems Architecture Development	
SYSE 532	Software Systems Engineering	
Total Credits		225.0-226.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

First Year

Fall

		Credits
CHEM 101	General Chemistry I	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
MATH 121	Calculus I	4.0
UNIV E101	The Drexel Experience	2.0
	Term Credits	15.5

Winter

CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
ENGR 131	Introductory Programming for Engineers	3.0
MATH 122	Calculus II	4.0
PHYS 101	Fundamentals of Physics I	4.0
	Term Credits	19.5

Spring

BIO 141	Essential Biology	4.5
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
ENGR 113	First-Year Engineering Design	3.0
MATH 200	Multivariate Calculus	4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	18.5

Second Year

Fall

ECE 200	Digital Logic Design	4.0
ENGR 220	Fundamentals of Materials	4.0
ENGR 210	Introduction to Thermodynamics	3.0
ENGR 231	Linear Engineering Systems	3.0
PHYS 201	Fundamentals of Physics III	4.0
	Term Credits	18.0

Winter

ENGR 232	Dynamic Engineering Systems	3.0
ECE 203	Programming for Engineers	3.0
ECE 201	Foundations of Electric Circuits I	4.0
General Ed elective		4.0
	Term Credits	14.0

Third Year

Fall

ECE 362	Engineering Statistics	3.0
ECES 301	Signals and Systems I	4.0
ECEL 301 [WI]	Electrical Engineering Laboratory	2.0
General Ed elective		6.0
	Term Credits	15.0

Winter

ECEL 302	ECE Laboratory II	2.0
ECES 303	Signals and Systems II	3.0
PHIL 315	Engineering Ethics	3.0
ECE elective		4.5
MATH elective		3.0
	Term Credits	15.5

Fourth Year

Fall

ECEL 303	ECE Laboratory III	2.0

EGMT 572	Statistical Data Analysis	3.0
SYSE 685	Systems Engineering Management	3.0
ECE Electives		7.0
	Term Credits	15.0

Winter

ECE 391	Introduction to Engineering Design Methods	1.0
ECEL 304	ECE Laboratory IV	2.0
EGMT 573	Operations Research	3.0
SYSE 688	Systems Engineering Analysis	3.0
ECE Electives		7.0
	Term Credits	16.0

Spring

EGMT 531	Engineering Economic Evaluation & Analysis	3.0
EGMT 690	Systems Engineering Analysis II	3.0
SYSE 521	Integrated Risk Management	3.0
Gen Ed electives		6.0
	Term Credits	15.0

Summer

SYSE 533	Systems Integration and Test	3.0
ECE Elective		4.0
Free Elective		6.0
	Term Credits	13.0

Fifth Year

Fall

ECE 491 [WI]	Senior Design Project I	2.0
SYSE 510	Systems Engineering Process	3.0
Free electives		5.5
ECE elective		3.0
Grad elective		3.0
	Term Credits	16.5

Winter

ECE 492 [WI]	Senior Design Project II	2.0
SYSE 520	Global Sustainment and Integrated Logistics	3.0
ECE elective		4.0
Free elective		3.0
Grad electives		6.0
	Term Credits	18.0

Spring

ECE 493	Senior Design Project III	4.0
SYSE 598	Capstone in Systems Engineering	3.0
ECE elective		4.5
Grad elective		3.0
General Education elective		2.0
	Term Credits	16.5

Total Credit: 226.0

Systems Engineering Faculty

Richard Grandrino, MBA *(Drexel University)*. Teaching Faculty. Manager for advanced logistics operations at Lockheed Martin

Steven Mastro, PhD *(Drexel University)*. Adjunct Faculty. Machinery Research and Silencing Division of NAVSEA Philadelphia. Work focuses on advanced sensor and control technologies for condition-based maintenance, damage control, and automation.

Miray Pereira, MBA *(Rutgers University)*. Adjunct Instructor. Manages a team of consultants responsible for development, facilitation and implementation of fundamental demand management systems and capabilities for DuPont, most recently with the DuPont Safety & Protection Platform in strategic planning, mergers & acquisitions.

Walter Sobkiw, BS *(Drexel University)*. Adjunct Faculty. Author of "Systems Engineering Design Renaissance" and "Systems Practices as Common Sense."

Fernando Tovia, PhD *(University of Arkansas)*. Adjunct Instructor. Core quantitative analysis,strategic planning, supply chain management and manufacturing systems.

John Via, DEngr *(Southern Methodist University)*. Teaching Professor. Pharmaceutical, Bio-pharmaceutical, and Medical Device development and manufacturing

Minor in Architectural Engineering

About the Minor

The minor in architectural engineering, designed to broaden the professional capabilities of students, offers the building systems portion of the architectural engineering curriculum with enough attention to structural components for completeness. Pursuing a minor in architectural engineering can be of interest to mechanical engineering students who wish to learn the application of HVAC systems within the building context; to civil engineering students who require knowledge of large-scale infrastructure systems; and to chemical engineering students who wish to understand the energy and distribution aspects of process plant design.

The minor consists of a minimum of 25.5 credits total, with five required core courses. Students take a minimum of eight additional credits taken from a list of optional courses.

While this minor is primarily designed to provide technical knowledge and skills to other engineers, with the appropriate prerequisites students from other disciplines—such as architecture—can also complete this minor.

Prerequisites

The common engineering core curriculum prerequisites are required of all students in the College of Engineering. Students from other colleges will need the appropriate background prerequisite courses in physics, mathematics and thermodynamics.

Program Requirements

Required Courses

AE 220	Introduction to HVAC	3.5
AE 340	Architectural Illumination and Electrical Systems [*]	3.0
AE 390	Architectural Engineering Design I	4.0
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
CIVE 302	Structural Analysis I	4.0
Select two of the following:		8.0
AE 391	Architectural Engineering Design II	
ARCH 191	Studio 1-AE	
or ARCH 181	Architecture Studio 1A	
CIVE 240 [WI]	Engineering Economic Analysis	
CIVE 250	Construction Materials	
CIVE 303	Structural Design I	
MEM 310	Thermodynamic Analysis I	
MEM 413	HVAC Loads	
Total Credits		25.5

[*]   Students can elect to take ARCH 293 *Building Systems III* (1.5 credits) AND ARCH 396 *Building Systems IV* (1.5 credits) in place of ARCH 340.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Chemical Engineering

About the Minor

Engineering students can obtain a minor in chemical engineering by taking 27.0 credits from the courses listed below.

Admission Requirements

Pre-requisites for the 200-level minor core.

Required Core Courses

CHE 211	Material and Energy Balances I	4.0
CHE 212	Material and Energy Balances II	4.0
CHE 220	Computational Methods in Chemical Engineering I	3.0
CHE 362	Chemical Kinetics and Reactor Design	4.0
Thermodynamics		
Complete one of the following [*]		4.0
CHE 230	Chemical Engineering Thermodynamics I	
or CHE 330	Chemical Engineering Thermodynamics II	
Transport		
Complete one of the following courses [**]		4.0
CHE 341	Fluid Mechanics	
CHE 342	Heat Transfer	
CHE 343	Mass Transfer	
Electives		
Choose from other CHE core courses, elective courses or research		4.0
Total Credits		27.0

[*]   CHE will not accept ENGR 210 towards the thermodynamics requirement

[**]   Students who take an equivalent transport course as part of their core curriculum must take a different transport course (e.g., MEM cannot count CHE 341 towards the transport requirement)

Minor in Computer Engineering

About the Minor

The computer engineering minor provides students from other majors with the foundation needed to understand both the hardware and software aspects of computers. Our engineers contribute to industry and research areas such as electronic circuits and systems, computer architecture, computer networking, embedded systems, high-performance computing, software engineering, robotics and machine intelligence, computer security, medical devices, and many more.

Prerequisites

The minor assumes that students will have a background in programming which would include ECE 105, ECE 203, or CS 171. Courses taken to meet these requirements will not count toward the minor.

Program Requirements

Required Courses

ECE 200	Digital Logic Design	4.0
ECEC 201	Advanced Programming for Engineers	3.0
ECEC 204	Design with Microcontrollers	3.0
ECEC 355	Computer Organization & Architecture	3.0
ECEC 357	Introduction to Computer Networks	3.0
Electives [*]		**9.0**
Total Credits		25.0

[*] Students should choose an additional 9 credits from 300- and/or 400-level Computer Engineering (ECEC) courses. All prerequisites must be satisfied.

Additional Information

Additional information about this minor is available on the ECE Department website (https://drexel.edu/engineering/academics/departments/electrical-computer-engineering/).

For advising questions, please contact the ECE advisor (https://drexel.edu/engineering/academics/departments/electrical-computer-engineering/resources/current-undergrad/).

Minor in Construction Management

About the Minor

Students in civil engineering, architectural engineering, architecture and business may select to pursue construction management as a minor area of study. Because construction is inherently related to design in these disciplines, the construction management minor can be a natural extension of each field of study.

The requirements for the minor include:

- Completion of a minimum of 24.0 credits.
- Courses used to fulfill general education requirements may not be counted toward an academic minor.
- Up to nine credits earned within the student's major may be counted toward the minor with minor department approval.

- Prerequisite courses may be counted toward the minor if recommended by the minor department.

Program Requirements

Required Courses

CMGT 161	Building Materials and Construction Methods I	3.0
CMGT 162	Building Materials and Construction Methods II	3.0
CMGT 361	Contracts And Specifications I	3.0
CMGT 362	Contracts and Specifications II	3.0
CMGT 363	Estimating I	3.0
CMGT 467	Techniques of Project Control	4.0
Select two of the following: [*]		6.0
CMGT 261	Construction Safety	
CMGT 263	Understanding Construction Drawings	
CMGT 364	Estimating II	
CMGT 385 [WI]	Selling and Negotiation Techniques in Construction	
CMGT 461	Construction Project & Company Management	
CMGT 463	Value Engineering	

[*] Choice of electives must be approved by the department based on the student's major field and prior experience.

Certain courses within the student's major may also be used to meet the minor requirements. These include:

ARCH 261	Environmental Systems I	3.0
ARCH 262	Environmental Systems II	3.0
CIVE 240 [WI]	Engineering Economic Analysis	3.0
ARCH 161	Architectural Construction [*]	3.0
Total Credits		12.0

[*] ARCH 161 can be substituted for CMGT 161 for Architects. An elective may be substituted for CMGT 162.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Electrical Engineering

About the Minor

The minor provides students with the foundation needed to understand the diverse areas covered by the electrical engineering major. Our engineers contribute to industry and research in areas that include electronic circuits and systems, lasers and photonics, semiconductor devices, computer and communication networks, biomedical engineering, bioinformatics, robotics, automation and control, and power and energy systems.

Prerequisites

The minor assumes that students will have a background in mathematics and physics equivalent to that covered in the first two years of the engineering curriculum. In mathematics, this would include calculus (MATH 121 - MATH 122 and MATH 200), linear algebra, and differential equations. The physics requirements are PHYS 101 and PHYS 102. Courses taken to meet these requirements will not count toward the minor.

Required Courses

ECE 200	Digital Logic Design	4.0
ECE 201	Foundations of Electric Circuits I	4.0
ECES 301	Signals and Systems I	4.0
Electives *		12.0
Total Credits		24.0

*   Students should choose 12.0 credits from the 300- and/or 400-level ECE courses. These courses can come from the Computer (ECEC), Electrophysics (ECEE), Electric Power (ECEP), or Systems (ECES) groups. All prerequisites must be satisfied. Students majoring in Computer Engineering and minoring in Electrical Engineering may **only** choose elective courses from the ECEE, ECEP, and ECES course groups.

Additional information

Additional information about this minor is available on the ECE Department website (https://drexel.edu/engineering/academics/departments/electrical-computer-engineering/).

For advising questions, please contact the ECE advisor. (https://drexel.edu/engineering/academics/departments/electrical-computer-engineering/resources/current-undergrad/)

Minor in Engineering Leadership

About the Minor

By completing a minor in Engineering Leadership, students will gain practice in self-reflection, mentorship, management, and communication. Students will customize their minor by choosing from one of four available tracks: entrepreneurship, leadership, management, and technology. A culminating project focused on solving engineering problems in the local community will connect students' technical knowledge with service to others.

Admission Requirements

This program is currently open to students in engineering disciplines, which include programs from the College of Engineering, College of Computing and Informatics, School of Biomedical Engineering, and students in the Business & Engineering program in the LeBow College of Business.

Program Requirements

Required Courses

EGMT 404 [WI]	Introduction to Engineering Management Communications	3.0
EGMT 462	Introduction to Engineering Management	3.0
EGMT 470	Engineering Leadership Capstone	2.0
ORGB 320	Leadership: Theory and Practice	4.0
Elective Tracks: Students must choose one of the following elective tracks. Substitutions may be made in any of these tracks with prior approval from the Department.		**12.0**
Management Track		
BLAW 201	Business Law I	
CIVE 240 [WI]	Engineering Economic Analysis	
EGMT 465	Introduction to Systems Engineering	
PROJ 401	Introduction to Project Management	
Entrepreneurship Track		
ENTP 210 [WI]	Leading Start-Ups *	
ENTP 215	Building Entrepreneurial Teams *	
ENTP 329	Entrepreneurship & New Technologies *	
ENTP 370	Global Entrepreneurship *	
ENTP 385	Innovation in Established Companies *	
Leadership Track		
ORGB 300 [WI]	Organizational Behavior	
ORGB 400	Team Development and Leadership	
ORGB 420	Negotiations and Conflict Resolution	
PROJ 403	Essentials of Project Leadership and Teamwork	
Technology Track		
MGMT 201	Introduction to Technology Innovation Management	
MGMT 301	Designing Innovative Organizations	
MGMT 302	Competing in Technology Industries	
MGMT 364	Technology Management	
SYSE 488	Systems Engineering Analysis	
Optional (these courses may be substituted for any of the above elective options)		
EGMT 295	Survey of Mentorship	
EGMT 296	Survey of Leadership	
Total Credits		24.0

*   ENTP 101 is a prerequisite for all ENTP courses, but it will not count towards the Minor in Engineering Leadership.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/)

Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Engineering Management

About the Minor

This minor focuses on the management of technical organizations. The required courses enhance an engineer's resume to show understanding of management and leadership behaviors, economics, and systems engineering and thinking.

While this minor is primarily designed to provide engineering management knowledge and skills to other engineers, with the equivalent science background students from other majors (biomedical engineering science, for example) can also complete this minor.

Prerequisites

The common engineering core curriculum prerequisites are required of all students in the college of engineering. Students from other colleges will need the appropriate background prerequisite courses.

Program Requirements

Required Courses

BLAW 201	Business Law I	4.0
CIVE 240 [WI]	Engineering Economic Analysis	3.0
PROJ 401	Introduction to Project Management	3.0
EGMT 404 [WI]	Introduction to Engineering Management Communications	3.0
EGMT 462	Introduction to Engineering Management	3.0
or MEM 462	Introduction to Engineering Management	
EGMT 465	Introduction to Systems Engineering	3.0
Complete 2 classes from the list below		**7.0**
ECON 201	Principles of Microeconomics	
ECON 202	Principles of Macroeconomics	
ENTP 329	Entrepreneurship & New Technologies	
Other courses accepted with Director approval		
Total Credits		26.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses

with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Additional Information

More information is available on the Engineering Management Minor (http://www.drexel.edu/egmt/programs/minor/) web page.

Minor in Engineering Policy Analysis

About the Minor

An increasingly complex, interrelated, and technological society has come to rely on quantitative models of engineering systems to make decisions. While these models are used to make decisions in domains as varied as telecommunications, energy, and environmental quality, a common set of tools for the use of such models in decision making has been developed and forms the basis of an emerging discipline in engineering policy analysis. The practitioners of this discipline need training in mathematical and social science analytic approaches, as well as an understanding of the human factors that inevitably influence real-world policy choices. The minor in engineering policy analysis is designed to introduce students to these topics.

This minor broadens the exposure of engineering students to societal issues and provides an initial introduction to analytic skills which they may use both in engineering practice and as managers (given that many engineers become managers both in the private and public sector). Graduates will have additional training and credentials relevant not only to engineering careers, but also to other fields, including urban planning, management consulting, and public administration.

The program provides a basis for students to evaluate their interest and aptitude for graduate studies in fields such as business administration, public administration, and public policy. For pre-law students, the minor introduces them to analytic methods that inform the establishment and interpretation of laws as a mechanism of public policy implementation.

Applied Quantitative Methods (6.0 credits minimum)

Students select one sequence in probability and statistics consisting of one introductory course and one advanced course. Any introductory course may be combined with advanced course provided that the prerequisites of the advanced course are met.		
Introductory Course Options		
Select one of the following:		3.0-4.0
CHE 350	Statistics and Design of Experiments	
ENGR 361	Statistical Analysis of Engineering Systems	
MATH 311	Probability and Statistics I	
MEM 361	Engineering Reliability	
STAT 205	Statistical Inference I	
Advanced Course Options		
Select one of the following:		3.0-4.0
MATH 312	Probability and Statistics II	
STAT 206	Statistical Inference II	
ENVE 750	Data-based Engineering Modeling	
Additional Quantitative Method Electives		
MATH 300	Numerical Analysis I	
MATH 305	Introduction to Optimization Theory	
MATH 318 [WI]	Mathematical Applications of Statistical Software	
OPR 320	Linear Models for Decision Making	
OPR 330	Advanced Decision Making and Simulation	

Policy Analytic Methods

Students are required to take at least 11.0 credits, including a course on capital investment decision making and a two-course sequence in economics.

CIVE 240 [WI]	Engineering Economic Analysis	3.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
Additional Policy Analytic Methods Electives		
ECON 250	Game Theory and Applications	
ECON 301	Microeconomics	
ECON 330	Managerial Economics	
ECON 334	Public Finance	
ECON 351	Resource and Environmental Economics	
ENVS 370	Practice of Environmental Economics	
ENVE 727	Risk Assessment	
Human Factors		
Select two of the following:		6.0
ENSS 347	Introduction to Environmental Policy Analysis	
PSCI 110	American Government	
PSCI 220	Constitutional Law I	
PSCI 372	City in United States Political Development	
SOC 215	Sociology of Work	
SOC 240	Urban Sociology	
Elective		
One additional credit of coursework is required for the minor. This credit may be any of the three areas above. It is permissible to count 3.0 of the credits from a 4.0 credit class towards fulfilling one of the other areas, thereby using the 4th credit to meet the elective credit requirement.		1.0
Total Credits		24.0-26.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Engineering Product Development

About the Minor

One of the final steps in creating a marketable product is the manufacturing of components. Throughout the design process, engineers must fully understand a variety of processes in which parts can be produced and assembled. Selecting a manufacturing method and

ensuring the parts are capable of production is a difficult but critical part of the product design process.

The minor in Engineering Product Development (EPD) will allow students to apply the theory of design for manufacturing (DFM) and design for assembly (DFA) to the overall design process. Topics include practical techniques for selection of materials and processes, design considerations for production, manual assembly and automated assembly, and Boothroyd and Dewhurst methods. Students review case studies and analyze production assemblies.

Program Requirements

EET 208	Introduction to Programming for Embedded Systems	3.0
MET 100	Graphical Communication	3.0
MET 101	Engineering Materials	3.0
MET 201	Introduction to Manufacturing Processes	3.0
MET 316	Computer Numerical Control	3.0
MET 321	Changing World of 3D Printing and Rapid Prototyping	3.0
MET 322	Design for Manufacturing and Assembly	3.0
PROD 101	History and Analysis of Product Design	3.0
PROD 220	Product Design Form Studio	4.0
Total Credits		28.0

Additional Information

For more information on the Engineering Product Development minor, please contact Gerry Willis at gtm23@drexel.edu or 215-895-6253.

Minor in Entertainment Engineering

About the Minor

Note: The Entertainment Engineering minor is not accepting new students until further notice. Please contact one of our advisors for additional information.

Digital technologies have revolutionized the world of entertainment and created a new field combining the foundations of electrical engineering with entertainment media. This minor is designed for students with the technical literacy to effectively use, as well as develop, new tools for digital content creation and manipulation for entertainment applications.

The entertainment engineering minor consists of a minimum of six (6) required courses and an additional two (2) elective courses.

Entertainment Engineering Option for Non-Engineering Majors

The minor assumes students have a background in mathematics (equivalent to Calculus II). Courses taken to meet these prerequisite requirements will not count toward the minor.

Required Courses		
DIGM 105	Overview of Digital Media	3.0
ECE 101	Electrical and Computer Engineering in the Real World	1.0
ECE 121	Introduction to Entertainment Engineering	3.0
ECES 201	Introduction to Audio-Visual Signals	4.0
ECES 352	Introduction to Digital Signal Process	4.0
PSY 101	General Psychology I	3.0
Electives		
Select one of the following:		3.0
PSY 213	Sensation and Perception	

INFO 310	Human-Centered Design Process & Methods	
Select one of the following:		3.0
FMVD 110	Basic Shooting and Lighting	
FMVD 115	Basic Editing	
FMVD 120	Basic Sound	
MIP 133	Digital Audio Workstations I	
Total Credits		24.0

Additional Information

Computer Engineering and Electrical Engineering majors must substitute ECES 301: *Systems and Signals I* for ECES 201.

Additional information about this minor is available on the ECE Department website (https://drexel.edu/engineering/academics/departments/electrical-computer-engineering/).

For advising questions, please contact the ECE advisor (https://drexel.edu/engineering/academics/departments/electrical-computer-engineering/resources/current-undergrad/).

Minor in Environmental Engineering

About the Minor

The Environmental Engineering minor focuses on pollution control and is primarily designed to broaden the professional capabilities of engineering students. For example, chemical and mechanical engineers working in process and manufacturing plants will be provided with a better understanding of the natural context of their facilities, better equipped to perform fate and risk analyses, and better able to apply the appropriate technology to control air and water discharges.

While this minor is designed to provide technical knowledge and skills to other engineers, with the appropriate prerequisites students from disciplines other than engineering can also complete this minor.

The minor consists of five required core courses and three additional courses taken from a list of options.

Prerequisites

The common engineering core curriculum prerequisites are required of all students in the College of Engineering. Students from other colleges will need the appropriate background in physics, mathematics and thermodynamics.

Required Courses

CAEE 203	System Balances and Design in CAEE	3.0
CIVE 330	Hydraulics	4.0
ENVE 300	Introduction to Environmental Engineering	3.0
ENVE 302	Environmental Transport and Kinetics	3.0
ENVS 401	Chemistry of the Environment	3.0
Select three of the following:		8.0
CIVE 430	Hydrology	
ENVE 410	Solid and Hazardous Waste	
ENVE 460	Fundamentals of Air Pollution Control	
ENVE 486	Environmental Engineering Processes Laboratory I	
ENVE 487	Environmental Engineering Processes Laboratory II	
Total Credits		24.0

Minor in Global Engineering

About the Minor

Engineering is a critical component of our increasingly connected and complex global economy. Whether developing sanitation systems in Nigeria for Engineers Without Borders, or managing engineering projects for a multinational company, understanding how to get things done in an international context is critical for today's engineers.

The Minor in Global Engineering is designed for engineers who plan to use their technical expertise in an international context. The coursework prepares students to become global citizens who are skilled and adaptive in meeting the challenges of a global work environment. The minor develops students' historical, political, and cultural awareness at a global level. It also provides students with the necessary knowledge of international business in order to succeed in the global economy.

In addition to the required coursework, students must successfully complete an experience abroad prior to graduation. Experiences other than approved Study Abroad (http://www.drexel.edu/studyabroad/) or Co-op Abroad programs must receive prior approval from the College of Engineering Associate Dean for Undergraduate Affairs.

Foreign language

Foreign language is not required for the Minor in Global Engineering, but it may be required as a prerequisite to a student's experience abroad. In addition, a student can choose to apply as many as eight (8.0) credits of 200-level or higher foreign language toward the credit requirements for the minor.

Restrictions

Currently, only students enrolled in the College of Engineering or the School of Biomedical Engineering, Science and Health Systems can enroll in this minor.

Program Requirements

Required Courses

ENGR 280	Introduction to Global Engineering	2.0
EGMT 350	Conflict Management for Engineers	3.0
EGMT 465	Introduction to Systems Engineering	3.0
PROJ 401	Introduction to Project Management	3.0
PROJ 435	Essentials of International Project Management	3.0
Select three of the following (a minimum of one course from each of the three categories):		10.0
International Business		
BLAW 340	International Business Law	
ECON 342	Economic Development [*]	
EGMT T380	Special Topics in EGMT	
INTB 200	International Business	
INTB 332	Multinational Corporations [*]	
INTB 334	International Trade [*]	
INTB 336	International Money and Finance [*]	
Political Science/History		
HIST 259	History of Europe in the 20th Century	
PSCI 140	Comparative Politics I	
PSCI 150	International Politics	
PSCI 351	International Organizations: The United Nations	
PSCI 352	Ethics and International Relations	
PSCI 353	International Human Rights	
PSCI 357	The European Union in World Politics	

Culture and Communications		
COM 360	International Communication	
SOC 330	Development and Underdevelopment in the Global South	
PHIL 335	Global Ethical Issues [**]	
WGST 240	Women and Society in a Global Context	
Total Credits		24.0

[*]   Require ECON 201 and ECON 202 as pre-requisites.

[**]   Requires PHIL 105 as a prerequisite.

Note: Students may petition the Engineering Management Department Head for permission to apply other courses they believe relevant to the Minor in Global Engineering toward their credit requirements. Such requests will be handled on a case-by-case basis.

Minor in Green Energy and Sustainability

About the Minor

This minor program aims to familiarize students with recent technological developments in renewable energy technologies and sustainability, as well as to conduct experimental work in these areas.

Students will explore the principles, characteristics and operation of various renewable energy sources, storage devices, and energy conversion systems. In addition, this minor is designed to encourage students to enhance their knowledge of the fields of sustainability and green energy technologies, so they may be able to expand their skills and career opportunities.

The minor in Green Energy and Sustainability has a broad audience, being created to give students both breadth and depth in this field, with focus on technologies and their societal, economic and environmental impact, with emphasis on the manufacturing industry.

Program Requirements

ECEP 480	Solar Energy Engineering	3.0
EET 201	Circuit Analysis I	4.0
EET 202	Circuit Analysis II	4.0
EET 320	Renewable Energy Systems	3.0
EET 322	Energy Conversion	4.0
INDE 240	Technology Economics	3.0
INDE 420	Industrial Energy Systems	3.0
Total Credits		24.0

Additional Information

For more information on the Green Energy and Sustainability minor, please contact Gerry Willis at gtm23@drexel.edu or 215-895-6253.

Minor in Materials Science and Engineering

About the Minor

In addition to the core engineering curriculum and the courses required for majors in chemical, civil, architectural and environmental, electrical, or mechanical engineering, engineering students from other majors can obtain a minor in materials science and engineering by completing 25.0 credits from the courses listed below.

Required Courses		
MATE 230	Fundamentals of Materials II	4.0
Select six (at least 21.0 credits) of the following:		21.0
MATE 214	Introduction to Polymers [*]	
MATE 240	Thermodynamics of Materials	
MATE 245	Kinetics of Materials	
MATE 280	Advanced Materials Laboratory	
MATE 341	Defects in Solids	
MATE 351	Electronic and Photonic Properties of Materials	
MATE 355	Structure and Characterization of Crystalline Materials	
MATE 370	Mechanical Behavior of Solids [**]	
MATE 455	Biomedical Materials	
Total Credits		25.0

[*]   MATE 214 requires CHEM 241 as a pre-requisite. If MATE 214 is elected, the credits for CHEM 241 can count toward the 21 credits.

[**]   MATE 370 requires MATH 201 as a pre-requisite. If MATE 370 is elected, the credits for MATH 201 can count toward the 21 credits.

Note: Only one of the prerequisites (either MATH 201 or CHEM 241) can count toward the required 25.0 credits. In other words, both MATE 214 and MATE 370 can be used to fulfill the requirements for the minor, but only the prerequisite for one of those courses will be counted toward the 25.0 credits required for the minor. Similarly, neither MATH 201 nor CHEM 241 can be counted alone as fulfilling the requirements for this minor. The credits for MATH 201 or CHEM 241 will only count toward the minor when the course(s) is/are taken as a prerequisite for MATE 214 or MATE 370, respectively. Substitution for these courses by equivalent courses offered by other departments and/or institutions may be made with the approval of the Department of Materials Science and Engineering on a case-by-case basis.

At least two-thirds of the content of a substitute course must be the same as that of the course in the list above. It is imperative that students check each course carefully with respect to prerequisites since some may be included in the list above and some may be from other departments. Courses taken outside of the MSE department as prerequisites do not count towards the 25.0 credits required for the minor. They may, however, be used as technical or free electives in students' home departments. Students pursuing the minor in Materials Science and Engineering are also encouraged to select a senior design topic that relates to the field of materials.

Minor in Mechanical Engineering and Mechanics

About the Minor

Any undergraduate student in good standing who has completed more than 30.0 credits at Drexel may apply for the minor in mechanical engineering.

The minor must contain a minimum of 24.0 MEM credits according to the following distribution: (a) 16.0 credits from any four of the 4-credit required course options; (b) at least eight credits from additional required courses or from the laboratory components and recommended electives.

Required Course Options		
Select four of the following:		16.0
MEM 220	Fluid Mechanics I	
MEM 230	Mechanics of Materials I	
MEM 238	Dynamics	

MEM 255	Introduction to Controls	
MEM 310	Thermodynamic Analysis I	
MEM 345	Heat Transfer	
MEM 355	Performance Enhancement of Dynamic Systems	
MEM 361	Engineering Reliability	
MEM 435	Introduction to Computer-Aided Design and Manufacturing	
Select three of the following:		8.0
Laboratories		
MEM 311	Thermal Fluid Science Laboratory	
MEM 331	Experimental Mechanics I	
MEM 351	Dynamic Systems Laboratory I	
Recommended Electives		
MEM 320	Fluid Dynamics I	
MEM 330	Mechanics of Materials II	
MEM 361	Engineering Reliability	
MEM 410	Thermodynamic Analysis II	
MEM 420	Aerodynamics	
MEM 423	Mechanics of Vibration	
MEM 425	Aircraft Design & Performance	
MEM 430	Advanced Stress Analysis	
MEM 437	Manufacturing Process I	
MEM 438	Manufacturing Process II	
MEM 440	Thermal Systems Design	
MEM 453	Aircraft Flight Dynamics & Control I	
MEM 455	Introduction to Robotics	
MEM 458	Micro-Based Control Systems I	
MEM 459	Control Applications of DSP Microprocessors	
MEM 462 [WI]	Introduction to Engineering Management	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Nuclear Engineering

About the Minor

The field of nuclear engineering covers topics from fundamental particle physics to nuclear power. Example commercial applications where nuclear engineers are utilized are power, medicine, oil exploration, and testing of materials. The nuclear engineering minor familiarizes students with terminology, mathematical applications, theory, and ethics

corresponding to common nuclear engineering topics. This minor is open to all engineering, physics, and chemistry majors.

The minor assumes that students will have a background in mathematics and physics equivalent to that covered in the first two years of the engineering curriculum. In mathematics, this would include calculus (MATH 121 - MATH 122) and dynamic engineering systems (ENGR 232). The physics requirements are PHYS 101, PHYS 102 and PHYS 201. In addition, CHEM 101, ENGR 220, and ENGR 231 are needed. Courses taken to meet these requirements will not count toward the minor.

Program Requirements

Required Courses		
ECEP 371	Introduction to Nuclear Engineering	2.0
or MEM 371	Introduction to Nuclear Engineering I	
ECEP 372	Radiation Detection and Measurement	3.0
ECEP 402	Theory of Nuclear Reactors	4.0
ECEP 406	Introduction to Radiation Health Principles	3.0
MATE 450	The Nuclear Fuel Cycle & Materials	3.0
PHYS 330	Introduction to Nuclear Physics	2.0
Select 9.0 credits from at least two of the following principal areas		9.0
Industrial Applications Electives		
ECEP 403	Nuclear Power Plant Design & Operation	
MEM 402	Power Plant Design	
MEM 448	Applications of Thermal Plasmas	
MEM 449	Applications of Non-Thermal Plasmas	
Power Engineering Electives		
ECEP 352	Electric Motor Control Principles	
ECEP 354	Energy Management Principles	
ECEP 411	Power Systems I	
ECEP 412	Power Systems II	
Nuclear & Thermal Engineering & Science Electives		
MEM 446	Fundamentals of Plasmas I	
MEM 447	Fundamentals of Plasmas II	
Materials Electives		
MATE 230	Fundamentals of Materials II	
MATE 341	Defects in Solids	
MATE 355	Structure and Characterization of Crystalline Materials	
MATE 370	Mechanical Behavior of Solids	
Transport Phenomena Electives		
CHE 341	Fluid Mechanics	
CHE 342	Heat Transfer	
CIVE 320	Introduction to Fluid Flow	
MEM 220	Fluid Mechanics I	
MEM 345	Heat Transfer	
Simulation Electives		
PHYS 105	Computational Physics I	
PHYS 305	Computational Physics II	
PHYS 405	Advanced Computational Physics	
Total Credits		26.0

The Nuclear Engineering minor is open to all engineering majors. The minor consists of a minimum of six required courses for 17.0 credits and an additional 9.0 credits of elective courses.

Additional Information

Additional information about this minor is available on the ECE Department website. (http://drexel.edu/ece/academics/undergrad/minors/)

For advising questions, please contact the ECE advisor (https://drexel.edu/engineering/academics/departments/electrical-computer-engineering/resources/current-undergrad/).

Minor in Project Management

Note: **The Project Management program is not currently accepting applications for the Minor in Project Management.**

The minor in Project Management is now housed in the Goodwin College of Professional Studies.

Project management focuses on the management of teams of people and other resources in the planning, design, execution, and implementation of various aspects of projects in practically every industry. The minor in Project Management provides students with the skills necessary to perform successfully as members of project management teams.

The minor in Project Management will provide a foundation for graduate education in project management and prepare interested students to pursue the Certified Associate in Project Management (CAPM)[®] or Project Management Professional (PMP)[®] credentials from the Project Management Institute (PMI) .

A minimum grade of "C" (2.0) must be earned in each course in this minor for the minor to be awarded.

Requirements

- Open to Drexel undergraduate students in any discipline.
- Must have sophomore, pre-junior, junior, or senior standing.
- Must have a cumulative GPA of at least 3.0.
- Application to Add a Minor form (approved by the student's primary academic advisor)

Required Courses

PROJ 401	Introduction to Project Management	3.0
PROJ 402	Essentials of Project Planning & Scheduling	3.0
PROJ 403	Essentials of Project Leadership and Teamwork	3.0
PROJ 415	Essentials of Project Estimation & Cost Management	3.0
PROJ 430	Essentials of Managing Multiple Projects	3.0
Select 3 additional courses:		**9.0**
PROJ 410	Essentials of Project Quality Management	
PROJ 420	Essentials of Project Risk Assessment & Management	
PROJ 435	Essentials of International Project Management	
Project Management Elective (4XX or higher)		
Other courses, with prior written approval of student's Academic Advisor and the Project Management program (must be 4XX or higher and be relevant to Project Management)		
Total Credits		24.0

Questions about the minor in Project Management should be directed to:

Mercedes Moultrie
Program Manager
Project Management Program
Tel: 215.571.3939
E-mail: mm342@drexel.edu

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Minor in Robotics and Automation

About the Minor

Robotics and Automation Engineering has evolved around several engineering and technology fields such as electrical, mechanical, electro-mechanical, as well as electronics engineering. It merges the fundamental principles of electrical hardware and sensor usage with pneumatics, hydraulics, computer programming and instrumentation science, and related applications.

The Minor in Robotics and Automation (ROBT) introduces students to mechatronics engineering and prepares them for automation related careers in process control, manufacturing, computerized hardware/software integration, and sustainable automated systems. It allows students to engage in real life industrial processes related to automation in an industrial robotics laboratory setting.

Program Requirements

EET 201	Circuit Analysis I	4.0
EET 205	Digital Electronics	4.0
EET 319	PLC Fundamentals	4.0
INDE 350	Industrial Engineering Simulation	3.0
MET 205	Robotics and Mechatronics	3.0
MET 209	Fluid Power	4.0
MET 310	Advanced Robotics and Mechatronics	3.0
Total Credits		25.0

Minor in Systems Engineering

About the Minor

Systems engineering is a set of processes and tools used to guide the engineering of large scale systems. Unlike traditional engineering which may focus on very specific technical components, systems engineers focus on the entirety of a system to ensure it is run efficiently and effectively. The Minor will prepare undergraduate students for the current demands of industry and provide them with the opportunity to achieve a formal education in systems engineering.

The Minor in Systems Engineering is designed for students in the College of Engineering and School of Biomedical Engineering who are interested in the management of large, complex systems. It leads to careers in a wide range of industries, such as aerospace, communications, healthcare, manufacturing, and transportation.

The opportunity to pursue a minor in systems engineering will be offered to students who meet the following conditions:

- Minimum 3.0 Cumulative GPA
- Upper Class students (sophomores, juniors, pre-juniors and seniors)
- Student in the College of Engineering or the School of Biomedical Engineering

Core Requirements

CIVE 240 [WI]	Engineering Economic Analysis	3.0
EGMT 462	Introduction to Engineering Management	3.0
or MEM 462	Introduction to Engineering Management	
EGMT 465	Introduction to Systems Engineering	3.0
INDE 362	Operations Research for Engineering I	3.0
SYSE 488	Systems Engineering Analysis	3.0
Complete 9 credits of courses from the following list		**9.0**

ECES 356	Theory of Control	
ECES 444	Systems and Control I	
INDE 350	Industrial Engineering Simulation	
INDE 365	Systems Analysis Methods I	
INDE 366	Systems Analysis Methods II	
MEM 355	Performance Enhancement of Dynamic Systems	
SYSE 530	Systems Engineering Design	
SYSE 531	Systems Architecture Development	
SYSE 532	Software Systems Engineering	
SYSE 533	Systems Integration and Test	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Technology

About the Minor

This minor provides both the breadth and the depth of knowledge in emerging technologies. It consists of a sampling of Engineering Technology courses that would provide students with a greater knowledge and appreciation of emerging technologies. The courses span the range of levels from first year to advanced undergraduate courses. The minor also covers emerging technology fields such as nanotechnology and renewable energy and emerging technological applications such as 3D printing and Computer Numerical Control (CNC).

The minor will serve students interested in an advance knowledge in emerging technologies or will be working in the technology field but whose majors are not necessarily engineering or engineering technology. These students will gain solid understanding of technology to stay competitive with their peers.

Program Requirements

EET 204	Introduction to Nanotechnology	3.0
EET 320	Renewable Energy Systems	3.0
EET 333 [WI]	Non-Destructive Evaluation of Materials	4.0
INDE 240	Technology Economics	3.0
MET 100	Graphical Communication	3.0
MET 205	Robotics and Mechatronics	3.0

MET 316	Computer Numerical Control	3.0
MET 321	Changing World of 3D Printing and Rapid Prototyping	3.0
Total Credits		25.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Additional Information

For more information on the Technology minor, please contact Gerry Willis at gtm23@drexel.edu or 215-895-6253.

Certificate in Construction Management Concepts

Certificate Level: Undergraduate
Admission Requirements: High school diploma or GED
Certificate Type: Certificate
Number of Credits to Completion: 19.0
Instructional Delivery: Campus, Online
Calendar Type: Quarter
Expected Time to Completion: 1 year
Financial Aid Eligibility: Not aid eligible
Classification of Instructional Program (CIP) Code: 52.2001
Standard Occupational Classification (SOC) Code: 11-9021

About the Program

If you are looking for a way to move your construction, architecture, or engineering career forward or are considering an undergraduate or graduate degree but are unable to make the full commitment at this time, consider a certificate program from Drexel's Construction Management program.

The undergraduate certificate in the Construction Science is designed to fill the training needs of industry leaders.

Developed at the request of two contractors' associations — the General Building Contractors Association and the Contractors Association of Eastern Pennsylvania — this certificate is suitable for those who have undergraduate degrees in other fields but wish to work in the construction

industry along with those who are already employed in the industry but seek career advancement or updated training.

The Construction Management Concepts Certificate focuses on construction contracts, specifications, and practices with regard to business law and liability. The certificate also covers value engineering and construction planning, scheduling, network systems, as well as the communications required for project control and claims prevention.

Admission Requirements

Successful completion of the Fundamentals of Construction Management Certificate (p. 290) and the Construction Science Certificate (p. 290).

Program Requirements

Requirements

CMGT 361	Contracts And Specifications I	3.0
CMGT 362	Contracts and Specifications II	3.0
CMGT 385 [WI]	Selling and Negotiation Techniques in Construction	3.0
CMGT 461	Construction Project & Company Management	3.0
CMGT 463	Value Engineering	3.0
CMGT 467	Techniques of Project Control	4.0
Total Credits		19.0

Sample Plan of Study

Term 1		Credits
CMGT 361	Contracts And Specifications I	3.0
CMGT 467	Techniques of Project Control	4.0
	Term Credits	7.0
Term 2		
CMGT 362	Contracts and Specifications II	3.0
CMGT 385 [WI]	Selling and Negotiation Techniques in Construction	3.0
	Term Credits	6.0
Term 3		
CMGT 461	Construction Project & Company Management	3.0
CMGT 463	Value Engineering	3.0
	Term Credits	6.0

Total Credit: 19.0

Certificate in Construction Science

Certificate Level: Undergraduate
Admission Requirements: High school diploma or GED
Certificate Type: Certificate
Number of Credits to Completion: 18.0
Instructional Delivery: Campus, Online
Calendar Type: Quarter
Expected Time to Completion: 1 year
Financial Aid Eligibility: Not aid eligible
Classification of Instructional Program (CIP) Code: 52.2001
Standard Occupational Classification (SOC) Code: 11-9021

About the Program

If you are looking for a way to move your construction, architecture, or engineering career forward or are considering an undergraduate or graduate degree but are unable to make the full commitment at this time, consider a certificate program from Drexel's Construction Management program.

The undergraduate certificate in the Construction Science is designed to fill the training needs of industry leaders.

Developed at the request of two contractors' associations — the General Building Contractors Association and the Contractors Association of Eastern Pennsylvania — this certificate is suitable for those who have undergraduate degrees in other fields but wish to work in the construction industry along with those who are already employed in the industry but seek career advancement or updated training.

Admission Requirements

Successful completion of Fundamentals of Construction Management (p. 290).

Program Requirements

Requirements

CMGT 266	Building Systems I	3.0
CMGT 267	Building Systems II	3.0
CMGT 363	Estimating I	3.0
CMGT 364	Estimating II	3.0
Select two of the following:		6.0
CMGT 262	Building Codes	
CMGT 265	Information Technologies in Construction	
CMGT 450	Management of Field Operations	
Total Credits		18.0

Sample Plan of Study

Term 1		Credits
CMGT 266	Building Systems I	3.0
CMGT 363	Estimating I	3.0
	Term Credits	6.0
Term 2		
CMGT 267	Building Systems II	3.0
CMGT 364	Estimating II	3.0
	Term Credits	6.0
Term 3		
Select two of the following:		6.0
CMGT 262	Building Codes	
CMGT 265	Information Technologies in Construction	
CMGT 450	Management of Field Operations	
	Term Credits	6.0

Total Credit: 18.0

Fundamentals of Construction Management

Certificate Level: Undergraduate
Admission Requirements: High school diploma or GED
Certificate Type: Certificate
Number of Credits to Completion: 18.0
Instructional Delivery: Campus, Online
Calendar Type: Quarter
Expected Time to Completion: 1 year
Financial Aid Eligibility: Not aid eligible
Classification of Instructional Program (CIP) Code: 52.2001
Standard Occupational Classification (SOC) Code: 11-9021

About the Program

If you are looking for a way to move your construction, architecture, or engineering career forward or are considering an undergraduate or graduate degree but are unable to make the full commitment at this time, consider a certificate program from Drexel's Construction Management program.

The undergraduate certificate in the Fundamentals of Construction Management is designed to fill the training needs of industry leaders.

Developed at the request of two contractors' associations — the General Building Contractors Association and the Contractors Association of Eastern Pennsylvania — this certificate is suitable for those who have undergraduate degrees in other fields but wish to work in the construction industry along with those who are already employed in the industry but seek career advancement or updated training.

Admission Requirements

High school diploma or GED

Program Requirements

Requirements

CMGT 101	Introduction to Construction Management	3.0
CMGT 161	Building Materials and Construction Methods I	3.0
CMGT 162	Building Materials and Construction Methods II	3.0
CMGT 163	Building Materials and Construction Methods III	3.0
CMGT 261	Construction Safety	3.0
CMGT 263	Understanding Construction Drawings	3.0
Total Credits		18.0

Sample Plan of Study

Term 1		Credits
CMGT 101	Introduction to Construction Management	3.0
CMGT 161	Building Materials and Construction Methods I	3.0
	Term Credits	6.0
Term 2		
CMGT 162	Building Materials and Construction Methods II	3.0
CMGT 261	Construction Safety	3.0
	Term Credits	6.0
Term 3		
CMGT 163	Building Materials and Construction Methods III	3.0
CMGT 263	Understanding Construction Drawings	3.0
	Term Credits	6.0

Total Credit: 18.0

NAE Grand Challenge Scholars Program

About the Program

The National Academy of Engineering (NAE) Grand Challenge Scholars Program is a combined curricular and extra-curricular program with five components that are designed to prepare students to be the generation that solves the grand challenges facing society in this century. Students will work with a mentor on research related to a NAE Grand Challenge, engage in an interdisciplinary curriculum, entrepreneurship, global perspective, and service learning. Upon completing the program the student will receive a certificate of completion signed by both the NAE and the responsible Drexel University official.

Admission Requirements

Students have the opportunity to join the program anytime in the third quarter of their freshman year but not later than the end of their third year. Candidates must have a GPA of at least 3.25. The application includes a statement on why the student wishes to be a part of the program and vision statement for completion of the program requirements including the research and civic engagement requirements. Students will complete a proposed plan of study that satisfies the requirements of the GCSP and must identify a mentor who they will work with in meeting the GCSP objectives.

For more information and program contacts, please review the NAE Grand Challenges Scholars Program (https://drexel.edu/engineering/resources/for-students/leadership-research-programs/nae-grand-challenges-scholars-program/) webpage.

Program Requirements

Project or research activity
Each Scholar will engage in some research that can be identified with one of the very broadly identified NAE Grand Challenges with a research mentor. The mentorship and research issues will be discussed at the student selection interviews.

Civic Engagement activity

Each student will complete service with one community organization. The Scholar will be required to submit a written report on their activity and accomplishments.

Please note: *In each of the coursework areas below, a student has the option of choosing an alternate course, provided it is approved by the program director and satisfies NAE requirements.*

Program Requirements		
Entrepreneurship and Innovation experience. Select two courses from the following:		6.0-8.0
ENTP 210 [WI]	Leading Start-Ups	
or ENTP 440	Launch It!: Early Stage	
or MGMT 260	Introduction to Entrepreneurship	
or MGMT 365	Business Plan for Entrepreneurs	
Global and cross-cultural perspectives. Select one course from the following:		2.0-3.0
ENTP 370	Global Entrepreneurship	
or ENGR 280	Introduction to Global Engineering	
International Business. Select one course from the following:		4.0
INTB 200	International Business	
or BLAW 342	Criminal Law	
Political Science/History. Select one course from the following:		4.0
PSCI 140	Comparative Politics I	
or PSCI 352	Ethics and International Relations	
or PSCI 357	The European Union in World Politics	
Culture and Communications. Select one course from the following:		3.0
COM 360	International Communication	
or GST 359	Culture and Values	
or WGST 240	Women and Society in a Global Context	
Total Credits		19.0-22.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must

be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

The College of Nursing and Health Professions

By anticipating and meeting the challenges presented by the nation's health care system, Drexel's College of Nursing and Health Professions is doing its part to guarantee a lasting legacy for current and future health professionals.

The College of Nursing and Health Professions offers a wide range of undergraduate programs. Many offer flexible scheduling, making it possible for students to continue their education through part-time, online, night, or weekend study.

Majors

- Behavioral Health Counseling (BS) (p. 294)
- Culinary Arts and Science (BSCAS) (p. 298)
- Health Sciences (BS) (p. 302)
- Health Services Administration (BS) (p. 306)
- Hospitality Management (BSHM) (p. 308)
- Nursing (BSN) (p. 311)
- Nursing (BSN) - Accelerated Career Entry (ACE) (p. 315)
- Nursing RN/BSN Completion Program (p. 317)
- Nutrition and Foods (BS) (p. 320)

Accelerated Programs

- Health Sciences / Physical Therapy (BS/DPT) (p. 323)
- Health Sciences / Physician Assistant (BS/MHS) (p. 325)
- Health Services Administration / Public Health (BS/MPH) (p. 326)
- Nursing (RN/BSN/MSN) (p. 328)
- Nutrition Sciences (BS/MS) (p. 331)

Minors

- Addictions Counseling (p. 334)
- Culinary Arts (p. 334)
- Exercise Science (p. 335)
- Food Science (p. 335)
- Food Studies (p. 335)
- Health Services Administration (p. 336)
- Nutrition (p. 336)
- Psychiatric Rehabilitation (p. 337)

Certificates

- Human Lactation (p. 337)
- Medical Billing and Coding (p. 338)

About the College

According to the US Bureau of Labor Statistics' employment projections, the health care sector accounts for nearly 40% of the net increase in employment over the next 10 years, adding 3.8 million jobs by 2024. The national movement to improve health and care delivery is rising in tandem with these numbers.

The College of Nursing and Health Professions has more than a century-long history of educating nurses and health professionals, uniquely preparing clinicians to practice and lead in a rapidly changing healthcare system. Since 2002, the College has embraced the practical ingenuity of Drexel through the refinement and development of more than 25 undergraduate and graduate nursing and health professions programs characterized by the integration of learning and work through cooperative education, a culture of excellence, innovation and technology infusion, research and deep civic engagement. The College has grown to include more than 5,000 students, 200 full-time faculty and 104 staff.

Mission and Approach

The College of Nursing and Health Professions prepares competent and compassionate health professionals through technology-infused and evidence-based programs. The College is committed to leading the way in improving health, reducing health disparities through innovative education, interdisciplinary research, and community-based practice initiatives.

The College has established an interdisciplinary practice in primary care, physical therapy, nutrition sciences and mental health care, including couple and family therapy, behavioral health counseling and creative arts therapies, where students learn and work with faculty in honing their clinical skills. In addition, Drexel's partnerships with employers of health professionals through its co-operative education program affords the opportunity for its undergraduate nursing and health professions students to work in the best healthcare institutions, regionally and nationally, as part of their program of study. This approach challenges the notion of "best practice" with "real practice" and helps our students to achieve the highest learning and clinical outcomes, while gaining a competitive edge in the job market.

Every program in the College has integrated into its curriculum cutting edge technology, including the use of high fidelity manikins and simulation, to build knowledge and skills in both safe and experimental learning situations before practice in actual clinical settings. All courses are web-enhanced with learning tools and information that support knowledge mastery.

The College's researchers in nutrition and rehabilitation sciences, couple and family therapy, and nursing and creative arts therapies have garnered on average $2.9 million in external funding annually. Undergraduate and graduate students work with cutting-edge researchers building knowledge in clinical disciplines with the ultimate goal of improving the quality and outcomes of care.

Accreditation

The College has 12 nationally accredited or approved clinical programs. Pass rates for professional licensing and board certifications are well above the national mean, with nine programs boasting a 100% pass rate and nursing first-time pass rates consistently above 95%.

- The Baccalaureate Degree in Nursing (BSN) and the Master's Degree in Nursing (MSN) programs are accredited by CCNE (Commission on Collegiate Nursing Education). These programs and the post-graduate APRN certificates are also approved by the Pennsylvania State Board of Nursing.
- The Couple and Family Therapy MFT degree and Post-Master's Certificate programs are accredited by COAMFTE (Commission on Accreditation of Marriage and Family Therapy Education).
- The Creative Arts Therapies MA degree programs in Art Therapy and Counseling, Dance/Movement Therapy and Counseling, and Music Therapy and Counseling are approved by AATA (American Art

Therapy Association), ADTA (American Dance Therapy Association), and AMTA (American Music Therapy Association), respectively.

- The Didactic Program in Nutrition is accredited by ACEND (Accreditation Council for Education in Nutrition and Dietetics).

- The Nurse Anesthesia program is accredited by COA (Council on Accreditation of Nurse Anesthesia Educational Programs).

- The Doctor of Physical Therapy (DPT) program is accredited by CAPTE (Commission on Accreditation in Physical Therapy Education).

- The Physician Assistant program is accredited by ARC-PA (Accreditation Review Commission on Education for the Physician Assistant).

Behavioral Health Counseling

Major: Behavioral Health Counseling
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 51.1508
Standard Occupational Classification (SOC) code: 21-1011

About the Program

The Behavioral Health Counseling program offers an innovative approach to undergraduate education offering interactive and experiential courses taught by certified, licensed, and experienced professionals. The program is designed to develop the clinical competencies needed to counsel and support people experiencing mental illnesses, substance use disorders, and children and families. During the freshman and sophomore years, students develop a foundation for clinical practice by studying humanities, social sciences, writing, biological sciences, math, and research methods. Students utilize this foundation to translate evidence- based research into practice. Students also complete ten required courses focusing on interpersonal communication skills, ethical standards, multicultural competence, addictions counseling skills, cognitive behavioral approaches, assessment and treatment planning, and psychiatric rehabilitation practices.

Students apply their knowledge and practice the skills learned during the program via community-based learning and using Drexel University's state of the art Center for Inter-professional Clinical Simulation and Practice (https://drexel.edu/cnhp/about/CICSP/). Students then select from a broad variety of electives based on their career interests. Diversity, equity, inclusion, and social justice principles are incorporated across the rigorous curriculum. The major also offers a co-op experience in a clinical setting that greatly enhances the student's preparation for employment after graduation and for graduate study.

For additional information about this major, visit the Counseling and Family Therapy Department (http://drexel.edu/cnhp/academics/departments/Counseling-and-Family-Therapy/) on the College of Nursing and Health Profession's web site.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
UNIV NH101	The Drexel Experience	1.0
Computing/Communication Requirement		
CS 150	Computer Science Principles	3.0
or COM 230	Techniques of Speaking	
English		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
Life Science		
BIO 100	Applied Cells, Genetics & Physiology	3.0
or BIO 107	Cells, Genetics & Physiology	
or BIO 161	General Biology I	
or BIO 164	General Biology Laboratory I	
Mathematics		
MATH 107	Probability and Statistics for Liberal Arts	3.0
or MATH 100	Fundamentals of Mathematics	
Humanities and Social Sciences		
ANTH 101	Introduction to Cultural Diversity	3.0
PSY 240 [WI]	Abnormal Psychology	3.0
SOC 101	Introduction to Sociology	3.0
Any HIST course		4.0
Humanities and Social Sciences Electives		**24.0**
Free Electives		**54.0**
Behavioral Health Counseling Courses Required		**30.0**
BACS 100	Life Span Human Development	
or PSY 120	Developmental Psychology	
BACS 200	Foundation of Behavioral Health Care	
BACS 220	Counseling Theory and Practice	
BACS 232	Ethics and Professional Responsibility	
BACS 234	Introduction to Addictive Disorders	
BACS 236 [WI]	Psychiatric Rehabilitation Principles and Practices	
BACS 255	Multicultural Counseling	
BACS 301	Group Counseling I	
BACS 304	Cognitive and Behavioral Counseling I	
BACS 401	Assessment and Treatment Planning	
Behavioral Health Counseling Electives		**39.0**
Select from the following:		
BACS 210	Behavioral Disorders	
BACS 230	Genetics and Mental Health	
BACS 310	Recovery and Relapse Prevention	
BACS 312	Case Management Methods	
BACS 320	Crisis and Brief Intervention	
BACS 325	Psychopharmacology for Counselors	
BACS 345	Careers in Behavioral Health	
BACS 350	Child Psychopathology	
BACS 360	Preventing Substance Abuse	
BACS 367	Advanced Counseling Intervention	
BACS 368	Addictions Counseling with Special Populations	
BACS 370	Problem Gambling Interventions	
BACS 380	Trauma-Informed Care	
BACS 390	Special Topics in Mental Health	
BACS 404	Cognitive and Behavioral Counseling II	
BACS 405	Family-Focused Interventions	

BACS 410	Child and Adolescent Support	
BACS 411	Forensic Behavior Health Service	
BACS 412	Group Counseling II	
BACS 414	Co-Occurring Disorders	
BACS 420	Psychiatric Rehabilitation Competencies	
BACS 430	Behavioral Health and Aging	
BACS 490	Senior Research Project	
Total Credits		180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plans of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

BS in Behavoral Health Counseling - Saturday Scholars, Winter Cohort

Term 1		Credits
BACS 232	Ethics and Professional Responsibility	3.0
BACS 234	Introduction to Addictive Disorders	3.0
BACS 255 or 220	Multicultural Counseling Counseling Theory and Practice	3.0
BACS 325	Psychopharmacology for Counselors	3.0
	Term Credits	12.0
Term 2		
BACS 236 [WI]	Psychiatric Rehabilitation Principles and Practices	3.0
BACS 350	Child Psychopathology	3.0
BACS 405	Family-Focused Interventions	3.0
BACS 420	Psychiatric Rehabilitation Competencies	3.0
	Term Credits	12.0
Term 3		
BACS 301	Group Counseling I	3.0
BACS 401	Assessment and Treatment Planning	3.0
BACS 410	Child and Adolescent Support	3.0
BACS 412	Group Counseling II	3.0
	Term Credits	12.0
Term 4		
BACS 100	Life Span Human Development	3.0

BACS 200	Foundation of Behavioral Health Care	3.0
BACS 210	Behavioral Disorders	3.0
BACS 220	Counseling Theory and Practice	3.0
	Term Credits	12.0
Term 5		
BACS 230	Genetics and Mental Health	3.0
BACS 310	Recovery and Relapse Prevention	3.0
BACS 368	Addictions Counseling with Special Populations	3.0
BACS 411	Forensic Behavior Health Service	3.0
	Term Credits	12.0
Term 6		
BACS 360	Preventing Substance Abuse	3.0
BACS 367	Advanced Counseling Intervention	3.0
BACS 414	Co-Occurring Disorders	3.0
BACS 490	Senior Research Project	3.0
	Term Credits	12.0
Term 7		
BACS 370	Problem Gambling Interventions	3.0
BACS 345 or 430	Careers in Behavioral Health Behavioral Health and Aging	3.0
	Term Credits	6.0
Term 8		
BACS 304	Cognitive and Behavioral Counseling I	3.0
BACS 312	Case Management Methods	3.0
BACS 320	Crisis and Brief Intervention	3.0
BACS 404	Cognitive and Behavioral Counseling II	3.0
	Term Credits	12.0

Total Credit: 90.0

BS Behavioral Health Counseling - Saturday Scholars, Fall Cohort

Term 1		Credits
BACS 100	Life Span Human Development	3.0
BACS 200	Foundation of Behavioral Health Care	3.0
BACS 210	Behavioral Disorders	3.0
BACS 220	Counseling Theory and Practice	3.0
	Term Credits	12.0
Term 2		
BACS 234	Introduction to Addictive Disorders	3.0
BACS 255	Multicultural Counseling	3.0
BACS 232	Ethics and Professional Responsibility	3.0
BACS 325	Psychopharmacology for Counselors	3.0
	Term Credits	12.0
Term 3		
BACS 236 [WI]	Psychiatric Rehabilitation Principles and Practices	3.0
BACS 350	Child Psychopathology	3.0
BACS 405	Family-Focused Interventions	3.0
BACS 420	Psychiatric Rehabilitation Competencies	3.0
	Term Credits	12.0
Term 4		
BACS 301	Group Counseling I	3.0
BACS 401	Assessment and Treatment Planning	3.0
BACS 410	Child and Adolescent Support	3.0
BACS 412	Group Counseling II	3.0
	Term Credits	12.0
Term 5		
BACS 304	Cognitive and Behavioral Counseling I	3.0
BACS 312	Case Management Methods	3.0
BACS 320	Crisis and Brief Intervention	3.0

BACS 404	Cognitive and Behavioral Counseling II	3.0
	Term Credits	12.0
Term 6		
BACS 230	Genetics and Mental Health	3.0
BACS 310	Recovery and Relapse Prevention	3.0
BACS 368	Addictions Counseling with Special Populations	3.0
BACS 411	Forensic Behavior Health Service	3.0
	Term Credits	12.0
Term 7		
BACS 360	Preventing Substance Abuse	3.0
BACS 367	Advanced Counseling Intervention	3.0
BACS 414	Co-Occurring Disorders	3.0
BACS 490	Senior Research Project	3.0
	Term Credits	12.0
Term 8		
BACS 370	Problem Gambling Interventions	3.0
BACS 430	Behavioral Health and Aging	3.0
BACS 345	Careers in Behavioral Health	3.0
	Term Credits	9.0

Total Credit: 93.0

BS Behavioral Health Counseling: 4-Year Co-op Option

Term 1		Credits
ANTH 101	Introduction to Cultural Diversity	3.0
BACS 100	Life Span Human Development	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 107 or 100	Probability and Statistics for Liberal Arts Fundamentals of Mathematics	3.0
UNIV NH101	The Drexel Experience	1.0
Humanities/Social Science elective		3.0
	Term Credits	16.0
Term 2		
BACS 220	Counseling Theory and Practice	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
SOC 101	Introduction to Sociology	3.0
Humanities/Social Science elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 3		
BACS 255	Multicultural Counseling	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
Humanities/Social Science electives		3.0
PSY 240 [WI]	Abnormal Psychology	3.0
	Term Credits	13.0
Term 4		
BACS 234	Introduction to Addictive Disorders	3.0
BACS 236 [WI]	Psychiatric Rehabilitation Principles and Practices	3.0
BIO 100, 107, 161, or 164	Applied Cells, Genetics & Physiology Cells, Genetics & Physiology General Biology I General Biology Laboratory I	3.0
Humanities/Social Science elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 5		
BACS 232	Ethics and Professional Responsibility	3.0

CS 150 or COM 230	Computer Science Principles Techniques of Speaking	3.0
BACS elective		3.0
History (HIST) elective		4.0
Free elective		3.0
	Term Credits	16.0
Term 6		
BACS 200	Foundation of Behavioral Health Care	3.0
BACS 401	Assessment and Treatment Planning	3.0
BACS elective		3.0
Free elective		3.0
Humanities/Social Science elective		3.0
	Term Credits	15.0
Term 7		
Humanities/Social Science elective		3.0
Free electives		12.0
	Term Credits	15.0
Term 8		
BACS 301	Group Counseling I	3.0
BACS 304	Cognitive and Behavioral Counseling I	3.0
BACS elective		3.0
Free elective		3.0
Humanities/Social Science elective		3.0
	Term Credits	15.0
Term 9		
BACS electives		9.0
Free electives		6.0
Humanities/Social Science Elective		3.0
	Term Credits	18.0
Term 10		
BACS electives		9.0
Free electives		6.0
	Term Credits	15.0
Term 11		
BACS electives		9.0
Free electives		6.0
	Term Credits	15.0
Term 12		
BACS elective		3.0
Free electives		9.0
	Term Credits	12.0

Total Credit: 180.0

BS Behavioral Health Counseling: 4-Year Non-Co-op Option

Term 1		Credits
ANTH 101	Introduction to Cultural Diversity	3.0
BACS 100	Life Span Human Development	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 107 or 100	Probability and Statistics for Liberal Arts Fundamentals of Mathematics	3.0
UNIV NH101	The Drexel Experience	1.0
Humanities/Social Science elective		3.0
	Term Credits	16.0
Term 2		
BACS 220	Counseling Theory and Practice	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
SOC 101	Introduction to Sociology	3.0

Humanities/Social Science elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 3		
BACS 255	Multicultural Counseling	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PSY 240 [WI]	Abnormal Psychology	3.0
Humanities/Social Science electives		6.0
	Term Credits	16.0
Term 4		
BACS 234	Introduction to Addictive Disorders	3.0
BACS 236 [WI]	Psychiatric Rehabilitation Principles and Practices	3.0
BIO 100 or 107	Applied Cells, Genetics & Physiology Cells, Genetics & Physiology	3.0
Humanities/Social Science elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 5		
BACS 232	Ethics and Professional Responsibility	3.0
BACS elective		3.0
COM 230 or CS 150	Techniques of Speaking Computer Science Principles	3.0
Free elective		3.0
History (HIST) elective		4.0
	Term Credits	16.0
Term 6		
BACS 200	Foundation of Behavioral Health Care	3.0
BACS 401	Assessment and Treatment Planning	3.0
BACS elective		3.0
Free elective		3.0
Humanities/Social Science elective		3.0
	Term Credits	15.0
Term 7		
BACS 301	Group Counseling I	3.0
BACS 304	Cognitive and Behavioral Counseling I	3.0
BACS elective		3.0
Free elective		3.0
Humanities/Social Science elective		3.0
	Term Credits	15.0
Term 8		
BACS elective		6.0
Free electives		9.0
	Term Credits	15.0
Term 9		
BACS elective		3.0
Free electives		9.0
Humanities/Social Science elective		3.0
	Term Credits	15.0
Term 10		
BACS electives		9.0
Free electives		6.0
	Term Credits	15.0
Term 11		
BACS electives		9.0
Free electives		6.0
	Term Credits	15.0
Term 12		
BACS elective		3.0

Free electives		9.0
	Term Credits	12.0

Total Credit: 180.0

BS Behavioral Health Counseling: Non-Co-op Online Option.

Students must transfer in between 90 and 135 quarter credits from other institutions to satisfy general education requirements. The actual number of courses needed to complete the major is dependent on the number of transfer credits accepted.

Term 1		Credits
The student transfers in 90 credits.		
PSY 120	Developmental Psychology	3.0
BACS 220	Counseling Theory and Practice	3.0
BACS 234	Introduction to Addictive Disorders	3.0
	Term Credits	9.0
Term 2		
BACS 200	Foundation of Behavioral Health Care	3.0
BACS 230	Genetics and Mental Health	3.0
BACS 232	Ethics and Professional Responsibility	3.0
	Term Credits	9.0
Term 3		
BACS 236 [WI]	Psychiatric Rehabilitation Principles and Practices	3.0
BACS 255	Multicultural Counseling	3.0
BACS 325	Psychopharmacology for Counselors	3.0
	Term Credits	9.0
Term 4		
BACS 301	Group Counseling I	3.0
BACS 310	Recovery and Relapse Prevention	3.0
BACS 405	Family-Focused Interventions	3.0
	Term Credits	9.0
Term 5		
PSY 240 [WI]	Abnormal Psychology	3.0
BACS 304	Cognitive and Behavioral Counseling I	3.0
BACS 380	Trauma-Informed Care	3.0
	Term Credits	9.0
Term 6		
BACS 312	Case Management Methods	3.0
BACS 404	Cognitive and Behavioral Counseling II	3.0
BACS 420	Psychiatric Rehabilitation Competencies	3.0
	Term Credits	9.0
Term 7		
BACS 410	Child and Adolescent Support	3.0
BACS 401	Assessment and Treatment Planning	3.0
BACS 430	Behavioral Health and Aging	3.0
	Term Credits	9.0
Term 8		
BACS 360	Preventing Substance Abuse	3.0
BACS 411	Forensic Behavior Health Service	3.0
BACS 414	Co-Occurring Disorders	3.0
	Term Credits	9.0
Term 9		
BACS 320	Crisis and Brief Intervention	3.0
BACS 367	Advanced Counseling Intervention	3.0
BACS 370	Problem Gambling Interventions	3.0
	Term Credits	9.0
Term 10		
BACS 368	Addictions Counseling with Special Populations	3.0
BACS 412	Group Counseling II	3.0

BACS 490[*]	Senior Research Project	3.0
	Term Credits	9.0

Total Credit: 90.0

* If 90 credits are transferred in, then 90 credits must be completed at Drexel University. The number of credits completed at Drexel depends on the number of credits transferred to the University. A minimum of 180 credits is required for graduation and this number includes transfer credits as well as credits taken at Drexel. This is just a sample plan based on 90 transfer credits.

Co-op/Career Opportunities

Drexel University has long been known for its cooperative education program, through which students mix periods of full-time, career-related employment with their studies. The Behavioral Health Counseling curriculum includes one co-op option that exposes students to the varied work environments of behavioral health professionals. Co-op provides students with an opportunity to assess their personal strengths and interests for a career in behavioral health by observing successful mental health and addictions professionals in action. Co-op students work for six months in paid or unpaid positions consistent with their interests, abilities, and aptitudes.

After Graduation

Graduates of the Behavioral Health Counseling program are widely acknowledged by regional employers as being among their best prepared new employees. This reputation helps graduates easily find preferred employment in a variety of behavioral health care settings. Many graduates elect to continue their education in graduate and doctoral programs at Drexel or leading universities across the nation. Within Drexel, students may select excellent graduate programs preparing them for licensure as behavioral health clinicians and/or administrative, research, and behavioral health policy-making positions.

Career Opportunities

Behavioral health counseling professionals are employed in a wide range of venues. Counselors are needed in social service agencies, schools, health care facilities, and inpatient and residential treatment settings. Counselors work with children, adolescents, adults, and elderly individuals who experience disability due to mental illnesses or substance use disorders. Graduates who choose to enter the behavioral health workforce find immediate employment in areas such as psychiatric rehabilitation; family and child support services; addictions counseling; case management and services coordination; forensic mental health services; individual and group counseling; and crisis intervention. The behavioral health care field is tremendously diverse and encompasses far more career opportunities than are listed here. There are career choices to be made at all levels of service — from direct care to administration and policy making. In this regard, students will find tremendous benefit both in the listings and outreach offered by Drexel's Steinbright Career Development Center and in the diverse professional career experience our faculty bring to our students.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) web page for more detailed information on post-graduate opportunities.

Facilities

The College of Nursing and Health Professions is located at Drexel University's Health Sciences Campus in Center City. A Clinical Learning Resource Center (http://www.drexel.edu/cnhp/about/CELR/) offers a simulation lab where students practices skills needed in their chosen behavioral health career. Sessions are video captured to allow students the opportunity to observe and critique their performance.

Behavioral Health Counseling Faculty

Veronica Carey, PhD *(Capella University) Assistant Dean of Diversity and Student Affairs.* Associate Clinical Professor. National and international speaker on psychiatric rehabilitation evidence-based best practices and diversity, equity, and inclusion. Adheres to social justice as an essential curriculum content orientation.

Lisa T. Schmidt, PhD *(University of Medicine and Dentistry of New Jersey).* Associate Clinical Professor. The identification of best practices in psychiatric rehabilitation, illness management and recovery, and psycho-education.

Ebony White, PhD, LPC, NCC, ACS *(Montclair State University).* Assistant Clinical Professor. Research focused on addressing issues in transracial adoption and improving trauma informed care within the African American community. Understanding global mental health within the African diaspora and expanding developmental pathways through advocacy and social justice.

Culinary Arts and Science

Major: Culinary Arts & Science
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 185.0
Co-op Options: One Co-op (Four years)
Classification of Instructional Program (CIP) code: 12.0509
Standard Occupational Classification (SOC) code: *35-2014*

About the Program

The major in culinary arts and science allows students to deeply explore cuisine—the practical techniques of cooking, but also its science, history, culture, politics and economics. Students receive a broad overview of cooking and cuisine and specialize in food and beverage management, which prepares students for leadership positions in the restaurant and food industry.

Students majoring in culinary arts and science are prepared for careers in the food industry such as pastry chef, chef, research chef or product developer.

This baccalaureate degree in culinary arts and science is among the first of its kind in the United States. This program comprises approximately equal parts liberal arts, business, hospitality management, food science, and culinary arts. The aim of the program is to prepare students as independent thinkers who can work collaboratively in the food industry.

Program Delivery Options

Drexel's BS degrees include courses in the liberal arts, the humanities, sciences, hospitality management and culinary arts. Three business

minors are also offered. The BS degree can be completed on a full-time or part-time basis:

Traditional Four-year option, with one co-op experience:
This option includes one six-month period of full-time employment in the junior year.

Four plus One option BS/MBA combined degree, with co-op experience:
This option combines the four-year BS degree followed by the one-year Professional MBA to qualify freshmen applicants. Incoming freshmen will generally have a minimum of 1300 on the SAT, a GPA of 3.5 or higher, and be in the top 10% of their high school graduating class. For MBA requirements visit the LeBow College Professional MBA (http://www.lebow.drexel.edu/academics/graduate/drexel-lebow-mba/) website.

Part-time option without co-op experience:
Students work closely with academic advisors to develop a customized plan of study toward degree completion.

London option:
(Available for Hospitality Management and Culinary Arts and Science students.) Students are invited to spend a term in their sophomore, junior or senior year in the Study Abroad Program (http://www.drexel.edu/studyabroad/), Drexel in London, while earning up to 18.0 credits. The program's emphasis is on the global implications of and opportunities within the hospitality industry.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Food & Beverage Management Concentration

General Education Requirements		
CHEM 201	Why Things Work: Everyday Chemistry	3.0
or CHEM 101	General Chemistry I	
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
UNIV SH101	The Drexel Experience	1.0
Arts & Humanities		9.0
Social Science		6.0
Food Science Courses		
FDSC 100	ServSafe	1.0
FDSC 120	Food and the Senses	3.0
FDSC 154	Science of Food and Cooking	4.0
FDSC 270	Microbial Food Safety and Sanitation	4.0
FDSC 350	Experimental Foods: Product Development	3.0
FDSC 401	Modernist Cuisine	3.0
Culinary Arts Courses		
CULA 115	Culinary Fundamentals	3.0
CULA 120	Techniques and Traditions I	3.0
CULA 121	Techniques and Traditions II	3.0

CULA 125	Foundations of Professional Baking	3.0
CULA 216	A la Carte	3.0
CULA 235	Professional Dining Room Management	3.0
CULA 291	Culinary Arts Practicum II	6.0
CULA 303	Global Cuisine Studio (Course taken twice for 6.0 credits total)	6.0
CULA 316	Butchery Laboratory	2.0
CULA 320	Advanced Culinary Studio	3.0
CULA 325	Garde Manger Laboratory	3.0
CULA 400	Directed Studies with a Master Chef	3.0
CULA 405 [WI]	Culture and Gastronomy I	3.0
CULA 421	Senior Design Project I	2.0
CULA 422	Senior Design Project II	2.0
CULA 423	Senior Design Project III	2.0
CULA 440	Food in the Arts	3.0
Hospitality Management Courses		
HRM 120	Principles of Food-Service Management	3.0
HRM 150	Food & Beverage Customer Service	3.0
HRM 160	Laws of the Hospitality Industry	3.0
HRM 220	Purchasing for the Hospitality Industry	3.0
HRM 330	Hospitality Marketing and Branding	3.0
HRM 335	Beverage Management	3.0
HRM 350	Cost Controls in Hospitality	3.0
HRM 435	Wine Regions of the World	3.0
CULA Electives		**18.0**
Free Electives		**12.0**
Business/Minor Requirements		**24.0**
Total Credits		185.0

Culinary Science Concentration

General Education Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV SH101	The Drexel Experience	1.0
Arts/Humanities Electives		9.0
Social Science Electives		6.0
Math/Science		
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
CHEM 103	General Chemistry III	5.0
CHEM 241	Organic Chemistry I	4.0
CHEM 242	Organic Chemistry II	4.0
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
NFS 215	Nutritional Chemistry	3.0
NFS 217	Nutrient Quality & Composition	1.0
PHYS 103	General Physics I	4.0
PHYS 104	General Physics II	4.0
STAT 201	Introduction to Business Statistics	4.0
STAT 202	Business Statistics II	4.0
Food Science Courses		
FDSC 100	ServSafe	1.0
FDSC 120	Food and the Senses	3.0
FDSC 154	Science of Food and Cooking	4.0
FDSC 270	Microbial Food Safety and Sanitation	4.0

FDSC 350	Experimental Foods: Product Development	3.0
FDSC 401	Modernist Cuisine	3.0
FDSC 450	Food Microbiology	3.0
FDSC 451	Food Microbiology Laboratory	2.0
FDSC 454	Microbiology & Chemistry of Food Safety	3.0
FDSC 456	Food Preservation Processes	3.0
FDSC 460	Food Chemistry	3.0
FDSC 461	Food Analysis	3.0
FDSC 468	Functional Foods	3.0
FDSC 487	Food Engineering	3.0
FDSC 490	Seminar in Food Science	1.0
Culinary Arts Courses		
CULA 115	Culinary Fundamentals	3.0
CULA 120	Techniques and Traditions I	3.0
CULA 121	Techniques and Traditions II	3.0
CULA 125	Foundations of Professional Baking	3.0
CULA 291	Culinary Arts Practicum II	6.0
CULA 303	Global Cuisine Studio (Course taken twice for 6.0 credits total)	6.0
CULA 405 [WI]	Culture and Gastronomy I	3.0
CULA 421	Senior Design Project I	2.0
CULA 422	Senior Design Project II	2.0
CULA 423	Senior Design Project III	2.0
Culinary Arts Electives		9.0
Free electives (or Business Minor)		23.0
Total Credits		185.0

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
CHEM 101	General Chemistry I	3.5
CULA 115	Culinary Fundamentals	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
FDSC 100	ServSafe	1.0
MATH 101	Introduction to Analysis I	4.0
UNIV SH101	The Drexel Experience	1.0
	Term Credits	15.5
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
CHEM 102	General Chemistry II	4.5
CULA 120	Techniques and Traditions I	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	15.5
Term 3		
CHEM 103	General Chemistry III	5.0
CULA 121	Techniques and Traditions II	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
FDSC 154	Science of Food and Cooking	4.0
FDSC 120	Food and the Senses	3.0
	Term Credits	18.0
Term 4		
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
PHYS 103	General Physics I	4.0

Arts & Humanities Elective		3.0
Free elective		3.0
	Term Credits	13.0
Term 5		
CHEM 241	Organic Chemistry I	4.0
CULA 125	Foundations of Professional Baking	3.0
NFS 215	Nutritional Chemistry	3.0
NFS 217	Nutrient Quality & Composition	1.0
PHYS 104	General Physics II	4.0
	Term Credits	15.0
Term 6		
CHEM 242	Organic Chemistry II	4.0
CULA 303	Global Cuisine Studio	3.0
FDSC 270	Microbial Food Safety and Sanitation	4.0
STAT 201	Introduction to Business Statistics	4.0
Free elective		3.0
	Term Credits	18.0
Term 7		
CULA 291	Culinary Arts Practicum II	6.0
STAT 202	Business Statistics II	4.0
Free elective		3.0
Arts/Humanities/Social Science		3.0
	Term Credits	16.0
Term 8		
CULA 405 [WI]	Culture and Gastronomy I	3.0
FDSC 350	Experimental Foods: Product Development	3.0
FDSC 450	Food Microbiology	3.0
FDSC 451	Food Microbiology Laboratory	2.0
Free elective		3.0
Arts/Humanities/Social Science		3.0
	Term Credits	17.0
Term 9		
CULA 303	Global Cuisine Studio	3.0
FDSC 401	Modernist Cuisine	3.0
FDSC 460	Food Chemistry	3.0
CULA elective		3.0
Free elective		3.0
Arts/Humanities/Social Science		3.0
	Term Credits	18.0
Term 10		
CULA 421	Senior Design Project I	2.0
FDSC 456	Food Preservation Processes	3.0
FDSC 487	Food Engineering	3.0
Arts/Humanities/Social Science Elective		3.0
Free elective		2.0
	Term Credits	13.0
Term 11		
CULA 422	Senior Design Project II	2.0
FDSC 454	Microbiology & Chemistry of Food Safety	3.0
FDSC 461	Food Analysis	3.0
CULA elective		3.0
Free elective		3.0
	Term Credits	14.0
Term 12		
CULA 423	Senior Design Project III	2.0
FDSC 468	Functional Foods	3.0
FDSC 490	Seminar in Food Science	1.0
Culinary Elective		3.0

Free elective		3.0
	Term Credits	12.0

Total Credit: 185.0

Term 1		Credits
CHEM 201	Why Things Work: Everyday Chemistry	3.0
CULA 115	Culinary Fundamentals	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
FDSC 100	ServSafe	1.0
MATH 101	Introduction to Analysis I	4.0
UNIV SH101	The Drexel Experience	1.0
	Term Credits	15.0
Term 2		
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
CIVC 101	Introduction to Civic Engagement	1.0
CULA 120	Techniques and Traditions I	3.0
CULA 125	Foundations of Professional Baking	3.0
NFS 101	Introduction to Nutrition & Food	1.0
NFS 100	Nutrition, Foods, and Health	2.0
	Term Credits	13.0
Term 3		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
CULA 121	Techniques and Traditions II	3.0
FDSC 120	Food and the Senses	3.0
FDSC 154	Science of Food and Cooking	4.0
CULA/HOSP elective		3.0
	Term Credits	16.0
Term 4		
CULA 316	Butchery Laboratory	2.0
CULA 405 [WI]	Culture and Gastronomy I	3.0
HRM 120	Principles of Food-Service Management	3.0
HRM 220	Purchasing for the Hospitality Industry	3.0
Free Elective		3.0
	Term Credits	14.0
Term 5		
HRM 150	Food & Beverage Customer Service	3.0
HRM 160	Laws of the Hospitality Industry	3.0
CULA 325	Garde Manger Laboratory	3.0
HRM 350	Cost Controls in Hospitality	3.0
Business Minor Course		4.0
	Term Credits	16.0
Term 6		
CULA 303	Global Cuisine Studio	3.0
FDSC 270	Microbial Food Safety and Sanitation	4.0
CULA/HOSP elective		3.0
Free elective		3.0
Business Minor Course		4.0
	Term Credits	17.0
Term 7		
CULA 291	Culinary Arts Practicum II	6.0
Arts/Humanities/Social Science elective		3.0
CULA/HOSP elective		3.0
Business Minor Course		4.0
	Term Credits	16.0
Term 8		
CULA 235	Professional Dining Room Management	3.0
CULA 440	Food in the Arts	3.0
FDSC 350	Experimental Foods: Product Development	3.0

CULA/HOSP electives		6.0
Arts/Humanities/Social Science elective		3.0
	Term Credits	18.0
Term 9		
FDSC 401	Modernist Cuisine	3.0
HRM 335	Beverage Management	3.0
HRM 330	Hospitality Marketing and Branding	3.0
Arts/Humanities/Social Science elective		3.0
Business Minor Course		4.0
	Term Credits	16.0
Term 10		
CULA 216	A la Carte	3.0
CULA 303	Global Cuisine Studio	3.0
CULA 421	Senior Design Project I	2.0
Free electives		3.0
Business Minor Course		4.0
	Term Credits	15.0
Term 11		
CULA 320	Advanced Culinary Studio	3.0
CULA 422	Senior Design Project II	2.0
HRM 435	Wine Regions of the World	3.0
Arts/Humanities/Social Science Elective		3.0
CULA/HOSP elective		3.0
	Term Credits	14.0
Term 12		
CULA 400	Directed Studies with a Master Chef	3.0
CULA 423	Senior Design Project III	2.0
Arts/Humanities/Social Science Elective		3.0
Business Minor Courses		4.0
Free elective		3.0
	Term Credits	15.0

Total Credit: 185.0

Bakery and Pastry Specialization

The Baking and Pastry Specialization provides students interested in pursuing a career in the bakeshop with the skills necessary to move up the ranks of the professional bakery. High-quality, from-scratch bakes goods and pastries continue to find prominent places on menus in fine-dining restaurants, coffee shops, cafes, and dedicated bakery retail shops. For those restaurants and shops that have the facility space, many hire skilled bakers to run internal pastry departments. The need to feature fresh-baked goods has led to the opening of more wholesale and commissary bakeries throughout the Northeast and across the country. Graduates who are highly skilled in baking and patisserie are in demand to serve in restaurant pastry programs and to run these high-volume commercial bakeries.

Required Courses

CULA 125	Foundations of Professional Baking	3.0
CULA 220	Patisserie I	3.0
CULA 225	Patisserie II	3.0
CULA 227	Wheat and Grains: Artisan Breads	3.0
CULA 228	Design, Presentation, and Decorating in Pastry	3.0
CULA 229	Confectionery	3.0
CULA 328	Brasserie Applied Baking	3.0
Total Credits		21.0

Co-op/Career Opportunities

The hospitality industry employs 15 million people nationwide. According to the National Restaurant Association statistics, employment is growing

at the rate of eleven percent each year, making this industry one of the fastest growing in the country. Our Culinary Arts & Science program enjoys close relationships with outstanding and internationally acclaimed chefs, in the finest restaurants, hotels and tourism partners in the greater Philadelphia area. We also have relationships with professional organizations that represent the industry on a regional, national and international level such as Research Chefs Association, Institute of Food Technologists and International Association of Culinary Professionals. These relationships result in over $80,000 a year in scholarship funding for our students.

Typical career paths for graduates include the following:

- Restaurants and private clubs, which employ over 9 million people in the US
- Hotels Resorts & Casinos with almost 2.5 million employees
- Airlines, tour operating companies, travel agencies and tourism consulting
- Convention, special events, meeting planning, and tourism agencies
- Food Service and beverage brokers, distributors, and suppliers to the industry
- Food waste and sustainability practices and solutions.

Co-Op Opportunities

Drexel University has long been known for its cooperative education/ internship programs, which allow students to mix periods of full-time, career-related employment with their studies. Culinary Arts & Science students pursue the 6-month co-op employment. This six-month experience during the junior year is tailored to fit the interests of each student. The following hotels, facilities, restaurants and clubs have recently offered co-op positions to Drexel's Culinary Arts & Science students. Although many of these examples are located in the Philadelphia area, co-op jobs are not limited to any region.

- Vernick Restaurant
- High Street Hospitality Group
- Jose Garces - Garces Group
- Marc Vetri - Vetri Family of Restaurants
- Kevin Spraga - Sbraga Restaurants
- Philadelphia Convention and Visitors Bureau
- America's Test Kitchen
- Philadelphia Chamber of Commerce
- Frog Commissary Catering at The Franklin Institute
- Walt Disney World Co
- Saxbys

Visit the Drexel Steinbright Career Development Center (http:// www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Facilities

The major facility of the Culinary Arts & Science program is located on the sixth floor of the Academic Building. It is a 6,500 square foot space that includes three state-of-the-art commercial kitchens, bakery and laboratories, as well as the Academic Bistro (http://drexel.edu/hsm/about/ academic-bistro/), the student-run restaurant, bar and lounge. The facility also includes a sensory analysis lab, hospitality and gaming lab, and conference room. As part of the curriculum, students in this major are required to take food safety and sanitation courses which include lab work at Papadakis Integrated Science Building.

Philadelphia Location
A unique feature of the Culinary Arts & Science program at Drexel is our location in Philadelphia, with proximity to New York City, Boston, Baltimore, and Washington DC, as well as the resort centers on the Atlantic seacoast and in the Pocono Mountains. These regions include hundreds of hotels, restaurants,and resorts, that are used for field trips and campus visits by hospitality resource professionals. Students also gain hands-on experience through faculty-directed field trips throughout the region.

Culinary Arts & Science Faculty

Jonathan Deutsch, PhD *(New York University)*. Professor. Social and cultural aspects of food, culinary education, culinary improvisation, recipe and product development; food sustainability.

Brandy-Joe Milliron, PhD *(Arizona State University)*. Associate Professor. The development and evaluation of modifications in the natural environment to promote healthier living; farm to table school initiatives

Michael Traud, JD *(Villanova University) Program Director, Hospitality and Tourism Management*. Assistant Clinical Professor. Implementation of Korean Cuisine in the United States; hospitality law; Italian cuisine.

Rosemary Trout, MS *(Drexel University) Interim Program Director, Culinary Arts and Food Science*. Instructor. Food labeling and regulations; food safety and sanitation in food service and food manufacturing; food processing; sensory evaluation.

Charles Ziccardi, MS *(Drexel University)*. Assistant Teaching Professor. Classic Italian cuisine, Italian culture, gardening for the kitchen, food sustainability, and professional hospitality management.

Emeritus Faculty

A. Philip Handel, PhD *(University of Massachusetts)*. Professor Emeritus. Food science, especially lipid chemistry; food composition and functionality; evaluation and analysis of frying fats and fried foods.

Health Sciences

Major: Health Sciences
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.5
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 51.1199
Standard Occupational Classification (SOC) code: 11-9111

About the Program

The Bachelor's degree program in Health Sciences at Drexel University exposes students to a wide variety of careers in health care and related professions. Our emphasis on interdisciplinary study, coupled with expert faculty, gives students the opportunity to explore different facets of health-related professions before matriculating to specialized graduate programs or entering the workplace. Whether you are on the fast track to a career in health professions or still finding your path, our Health Sciences Program offers a multitude of options for completing your degree.

What you will learn

The Health Sciences Program offers a rigorous four-year curriculum for students interested in pursuing careers in health-related professions. Courses in health and clinical sciences, research methods, statistics, and healthcare ethics are combined with a core curriculum of mathematics, humanities, and social sciences to provide a fully integrated and comprehensive curriculum.

Career Opportunities

Health care professions are one of the fastest growing job sectors in the United States. There is tremendous demand for trained health care providers at all levels. In the Health Sciences Program, our multidisciplinary approach, flexible curriculum, and co-op experience provide students with a highly competitive edge in the market place and in the pursuit of graduate program admission. Some of the fields Health Sciences graduates can expect to pursue post-graduation include:

- Rehabilitation Professions
  - Physical therapy
  - Occupational therapy
  - Speech and language pathology
  - Cardiac rehabilitation
- Physician Assistant Studies
- Medicine and Dentistry
- Optometry
- Audiology
- Clinical Research
- Public Health and Health Advocacy
- Nursing
- Exercise Physiology
- Nutrition Sciences
- Bioethics
- Health Psychology

Co-op Experience

Drexel University has long been known for its cooperative education programs. As part of the Health Sciences curriculum, students incorporate a six-month co-op experience into their plan of study. This allows students to learn from healthcare leaders at renowned facilities nationwide. By building career-related employment into undergraduate study, students gain work experience, network with healthcare professionals, and hone their clinical and research skills. Some local co-op employers of Health Sciences students include Children's Hospital of Philadelphia, Magee Rehabilitation Hospital, Bryn Mawr Rehabilitation Hospital, Hahnemann University Hospital, Good Shepherd Penn Partners, NovaCare, and many other health care facilities in the region.

Accelerated Options

The Health Sciences program offers accelerated academic tracks for high achieving students to pursue degrees in the Physician Assistant Studies (p. 325) program and the Doctor of Physical Therapy (p. 323) program within the College of Nursing and Health Professions.

Articulation Agreement Options

Drexel's Health Sciences Department and Salus University's Occupational Therapy Department have partnered to offer a BS/MSOT sequential degree program. In the BS/MSOT Option, students first complete a Bachelor of Science (BS) degree in Health Sciences at Drexel University, then enroll into the 2-year Master of Science in Occupational Therapy (MSOT) program at Salus University.

Optional Concentration in Exercise Science

The concentration in Exercise Science helps prepare Health Sciences majors for graduate studies in Exercise Physiology. In addition, the concentration provides foundational knowledge and skills for a variety of fitness certifications from the American College of Sports Medicine, National Strength and Conditioning Association, and others. These certifications are often required of graduates interested in seeking employment in the fitness industry.

Drexel Graduate Options in Biomedical Sciences

Graduates of the Health Sciences program may also continue their education in the Graduate School of Biomedical Sciences and Professional Studies which offers over 40 doctoral, master's and professional development programs. These academic programs emphasize real-world experience and help guide students to make career decisions that best fit their abilities and evolving needs.

For more information, visit the Health Sciences Program (http://www.drexel.edu/cnhp/academics/departments/Health-Sciences/) page at the College of Nursing and Health Professions web site.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
UNIV NH101	The Drexel Experience	1.0
English Sequence		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
Biology Sequence		
BIO 122	Cells and Genetics	4.5
BIO 124	Evolution & Organismal Diversity	4.5
BIO 126	Physiology and Ecology	4.5
BIO 226	Microbiology for Health Professionals	5.0
Chemistry Sequence		
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
CHEM 103	General Chemistry III	5.0
Mathematics Sequence		
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
Communications		
COM 320 [WI]	Science Writing	3.0
Health Systems		
ECON 240	Economics of Health Care Systems	4.0
HSAD 210	Health-Care Ethics I	3.0

Complete 1 of the following courses:		3.0
HSAD 309	Advanced Health-Care Ethics	
HSAD 310	Introduction to Health-Systems Administration	
HSAD 345	Ethics in Health Care Management	
Psychology		
PSY 101	General Psychology I	3.0
Two Psychology (PSY) and/or Behavioral Health Counseling (BACS) courses (minimum 6.0 credits)		6.0
Sociology		
SOC 101	Introduction to Sociology	3.0
Two Sociology (SOC) courses (minimum 6.0 credits)		8.0
Humanities		
Three Humanities (HUM, HIST, ANTH, PHIL or language electives) (minimum 9.0 credits)		9.0
Public Health		
PBHL 101	Public Health 101	3.0
One Public Health (PBHL) course (minimum 3.0 credits)		3.0
Anatomy & Physiology Courses		
ANAT 101	Anatomy & Physiology I	5.0
ANAT 102	Anatomy & Physiology II	5.0
ANAT 103	Anatomy & Physiology III	5.0
Research Courses		
HSCI 310	Introduction to Research Methods	4.0
HSCI 315	Current Issues in Health Sciences	4.0
Statistics and Assessment		
HSCI 201	Health Assessment through the Lifespan	4.0
STS 345	Statistics for the Health Sciences	4.0
Health Sciences electives (HSCI, PHGY, ANAT, NEUR, NFS) [*]		**32.0**
Free electives		**19.0**
Total Credits		180.5

[*]   Health Sciences electives include any HSCI, ANAT, PHGY, NEUR or NFS course. Up to two BIO courses may be used as Health Sciences electives with advisor permission. All 100-level freshman course requirements in BIO, CHEM, ENGL, and MATH must be complete by the time a student reaches 135.0 credits.

Optional Concentration in Exercise Science

The concentration in Exercise Science helps prepare students for graduate studies in Exercise Physiology. In addition, the concentration provides foundational knowledge and skills for a variety of fitness certifications from the American College of Sports Medicine, National Strength and Conditioning Association, and others. These certifications are often required of graduates interested in seeking employment in the fitness industry.

Students wishing to complete the concentration in Exercise Science must complete the courses listed below as 17.0 of their elective credits.

Required courses:		
HSCI 325	Exercise Physiology	4.0
HSCI 326	Applied Anatomy and Kinesiology	5.0
Complete 8.0 credits from the following list:		**8.0**
HSCI 415	Musculoskeletal Pathophysiology	
HSCI 490	Senior Research Project	
HSCI T480	Special Topics in Health Sciences	
NFS 100 & NFS 101	Nutrition, Foods, and Health and Introduction to Nutrition & Food	
NFS 325	Nutrition & Exercise Physiology	
HSCI 425	Exercise Testing and Prescription	
HSCI 410	Psychology of Physical Activity	
Total Credits		17.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plans of Study

BACHELOR OF SCIENCE IN HEALTH SCIENCES - 12 TERMS

2 terms of COOP occur after Term 7.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BIO 122	Cells and Genetics	4.5
CHEM 101	General Chemistry I	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
UNIV NH101	The Drexel Experience	1.0
Free elective		3.0
	Term Credits	15.0
Term 2		
BIO 124	Evolution & Organismal Diversity	4.5
CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 101	Introduction to Analysis I	4.0
	Term Credits	17.0
Term 3		
BIO 126	Physiology and Ecology	4.5
CHEM 103	General Chemistry III	5.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	16.5
Term 4		
ANAT 101	Anatomy & Physiology I	5.0
BIO 226	Microbiology for Health Professionals	5.0
STS 345	Statistics for the Health Sciences	4.0

Left column:

Free elective		3.0
	Term Credits	17.0

Term 5

ANAT 102	Anatomy & Physiology II	5.0
COOP 101	Career Management and Professional Development	0.0
PSY 101	General Psychology I	3.0
Free elective		3.0
Health Sciences elective*		4.0
	Term Credits	15.0

Term 6

ANAT 103	Anatomy & Physiology III	5.0
COM 320 [WI]	Science Writing	3.0
HSAD 210	Health-Care Ethics I	3.0
HSCI 310	Introduction to Research Methods	4.0
	Term Credits	15.0

Term 7

SOC 101	Introduction to Sociology	3.0
One of the following:		3.0
HSAD 309	Advanced Health-Care Ethics	
HSAD 310	Introduction to Health-Systems Administration	
HSAD 345	Ethics in Health Care Management	
PSY elective		3.0
Free elective		3.0
	Term Credits	12.0

Term 8

PBHL 101	Public Health 101	3.0
HSCI 315	Current Issues in Health Sciences	4.0
Health Sciences electives*		6.0
	Term Credits	13.0

Term 9

HSCI 201	Health Assessment through the Lifespan	4.0
Health Sciences electives*		4.0
Sociology elective		4.0
Free elective		3.0
	Term Credits	15.0

Term 10

ECON 240	Economics of Health Care Systems	4.0
Health Sciences electives*		7.0
Free elective		3.0
	Term Credits	14.0

Term 11

Health Sciences elective*		3.0
Humanities/Social Science electives		6.0
Sociology elective		4.0
Free elective*		3.0
	Term Credits	16.0

Term 12

Health Sciences electives*		6.0
Humanities/Social Science elective		3.0
PBHL elective		3.0
PSY elective		3.0
	Term Credits	15.0

Total Credit: 180.5

* See degree requirements (p. 303).

Accelerated BS in Health Sciences - 10 terms

Term 1		Credits
BIO 122	Cells and Genetics	4.5
CHEM 101	General Chemistry I	3.5

Right column:

ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
UNIV NH101	The Drexel Experience	1.0
Humanities elective		3.0
Free elective		3.0
	Term Credits	18.0

Term 2

BIO 124	Evolution & Organismal Diversity	4.5
CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
MATH 101	Introduction to Analysis I	4.0
	Term Credits	17.0

Term 3

BIO 126	Physiology and Ecology	4.5
CHEM 103	General Chemistry III	5.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
MATH 102	Introduction to Analysis II	4.0
Free elective		3.0
	Term Credits	19.5

Term 4

PSY 101	General Psychology I	3.0
SOC 101	Introduction to Sociology	3.0
Health Science electives		6.0
Humanities elective		3.0
Free elective		3.0
	Term Credits	18.0

Term 5

ANAT 101	Anatomy & Physiology I	5.0
BIO 226	Microbiology for Health Professionals	5.0
STS 345	Statistics for the Health Sciences	4.0
Humanities elective		3.0
Free elective		3.0
	Term Credits	20.0

Term 6

ANAT 102	Anatomy & Physiology II	5.0
HSCI 310	Introduction to Research Methods	4.0
Psychology elective		3.0
Health Sciences elective		7.0
	Term Credits	19.0

Term 7

ANAT 103	Anatomy & Physiology III	5.0
COM 320 [WI]	Science Writing	3.0
HSAD 210	Health-Care Ethics I	3.0
Health Sciences elective		4.0
Free elective		3.0
	Term Credits	18.0

Term 8

One of the following:		3.0
HSAD 309	Advanced Health-Care Ethics	
HSAD 310	Introduction to Health-Systems Administration	
HSAD 345	Ethics in Health Care Management	
PBHL 101	Public Health 101	3.0
Health Sciences elective		3.0
Psychology elective		3.0
Sociology elective		4.0
Free elective		3.0
	Term Credits	19.0

Term 9

ECON 240	Economics of Health Care Systems	4.0
HSCI 315	Current Issues in Health Sciences	4.0
Health Sciences elective		4.0
Public Health elective		3.0
	Term Credits	15.0
Term 10		
HSCI 201	Health Assessment through the Lifespan	4.0
Health Sciences electives		6.0
Sociology elective		4.0
Free elective		3.0
	Term Credits	17.0

Total Credit: 180.5

Facilities

The College of Nursing and Health Professions is located on Drexel University's Center City Campus. Students have access to the *Center for Interdisciplinary Clinical Simulation and Practice (CICSP)* which utilizes patient actors and automated simulation manikins to mimic real-life human physiology. The CICSP provides undergraduate Health Sciences students the opportunity to learn assessment and communication skills in a controlled setting. The College of Nursing and Health Professions also maintains the *Stephen and Sandra Sheller 11th Street Family Health Services of Drexel University*, a comprehensive, community-based health center, where students have unique opportunities to observe and participate in health care delivery.

Health Sciences Faculty

Michael Bruneau, Jr., PhD ACSM EP-C *(Springfield College).* Assistant Teaching Professor. The use of physical activity and exercise as a nonpharmacological lifestyle therapy for the prevention, treatment, and control of chronic disease; examination of supervised exercise in clinical populations including those living with overweight and obesity, hypertension, chronic kidney disease, HIV/AIDS, substance use disoders, and Alzheimer's Disease and Related Dementias, sciences of systematic review and meta-analysis

William D'Andrea, MS, BS Pharm, CCP *(MCP Hahnemann University) Associate Chair, Health Sciences..* Assistant Teaching Professor. Pharmacology, anatomy & physiology.

Mary Elizabeth Flynn, PhD *(Temple University) Undergraduate Director, Health Sciences.* Assistant Teaching Professor. Anatomy and physiology, developmental anatomy, genetics, and emerging tech in health care.

Jodie Haak, PhD *(University of Iowa).* Assistant Professor. Physiology and applied physiology, Aging and STEM pedagogy.

Michael L. Kirifides, PhD *(Hahnemann University).* Assistant Teaching Professor. Identifying, designing, and implementing preparation approach to improve standardized testing outcomes for students in the undergraduate healthcare programs. Human anatomy and physiology, toxicology, pharmacology, and neuroscience.

Margery A. Lockard, PT, PhD *(Hahnemann University).* Clinical Professor. Orthopedic/musculoskeletal physical therapy; management of patients using prosthetic and orthotic devices; and anatomy, physiology and kinesiology.

Krista L. Rompolski, PhD ACSM EP-C *(University of Pittsburgh) Director of Anatomy and Physiology, Health Sciences. Co-Director of the Human Anatomy Laboratory.* Associate Teaching Professor. Scholarship of

teaching and learning (SoTL) in the fields of anatomy and physiology; pathophysiology, and gross anatomy.

Stephen Samendinger, PhD *(Michigan State University).* Associate Professor. Studying the effect of group dynamics, self-efficacy, and social influence on healthy lifestyles motivation; understanding differences in motivation by studying how we interpret our social environment and form beliefs and associated conscious and non-conscious goal pursuits.

Sinclair A. Smith, MS, DSc *(Boston University) Chair, Health Sciences.* Professor. Effects of aging, dehydration, and oral creatine supplementation on skeletal muscle metabolism using phosphorus magnetic resonance spectroscopy. Anatomy, physiology, and exercise science.

Health Services Administration

Major: Health Services Administration
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 51.0701
Standard Occupational Classification (SOC) code: 11-9111

About the Program

The Health Services Administration program provides students with a foundation in management and economic principles related to health care, as well as an understanding of the administrative structure, operations, and policies of the health care industry.

The Health Services Administration (HSA) curriculum is a four-year full-time course of study consisting of 180.0 quarter credits and including one cooperative (co-op) experience comprised of two consecutive quarter terms during the first half or the second half of the junior year. (A non-co-op full-time time option is also available). Transfer students are eligible for the full-time curriculum with or without co-op depending on the number of approved transfer credits.) The curriculum is designed to give students a foundation in general management and economic principles and policies related to health care, as well as to expose students to the quantitative and qualitative aspects of the health care industry by means of courses in health care related to policy, law, economics, management, marketing, and health information systems. At the same time, the curriculum provides interdisciplinary courses dealing with religious, ethical, psychosocial, political, legal, literary, and historical perspectives regarding health care practices and populations in need of health care. Courses in disability and aging expand students' understanding of the role of society and health care in the lives of individuals not always well understood. In addition, the curriculum can prepare students wishing to pursue graduate studies in health services administration, business administration, public health, law, and health communication.

The program also provides a minor in HSA for Drexel University bachelor's degree-seeking students and an online certificate in Medical Billing and Coding (p. 338) for non-degree-seeking students.

Courses are available online (http://online.drexel.edu/online-degrees/healthcare-degrees/bs-hsa/). At least 60.0 approved transfer semester credits (90.0 approved quarter credits) including courses in:

- English composition and/or literature
- Natural sciences with a lab

- Computing course
- Mathematics or statistics
- Humanities/Social Sciences
- Up to 75.0 approved transfer semester credits (105.0 approved quarter credits) for students with strong academic background in health services administration

Additional Information

The contact for this program is:

Susan Feinstein, BS
Program Coordinator, Health Services Administration
1601 Cherry Street, 7th floor, Room 773
Philadelphia PA, 19102
267-359-5543
slf52@drexel.edu

For more information, visit the Health Services Administration (https://drexel.edu/cnhp/academics/undergraduate/BS-Health-Services-Administration/) page on the College's website.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

English Sequence

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
Natural Sciences		**8.0-10.0**
Students may select from Biology (BIO), Chemistry (CHEM) or Anatomy (ANAT) courses. However, any course selected must include a laboratory component. Additional natural science subject options may be considered with the approval of the student's advisor.		
Mathematics		
MATH 101	Introduction to Analysis I	3.0-4.0
or MATH 171	Introduction to Analysis A	
MATH 102	Introduction to Analysis II	3.0-4.0
or MATH 172	Introduction to Analysis B	
Computing Course		
CS 150	Computer Science Principles	3.0
Drexel Experience		
CIVC 101	Introduction to Civic Engagement	1.0
UNIV NH101	The Drexel Experience	1.0
or UNIV 101	The Drexel Experience	
Health Services Administration Core Requirements		
HSAD 210	Health-Care Ethics I	3.0
HSAD 310	Introduction to Health-Systems Administration	3.0
HSAD 321	Health-Care Human Resources	3.0
HSAD 322	Health-Care Law	3.0
HSAD 330	Financial Management in Health Care	3.0
HSAD 331 [WI]	Non-profits and Health Care	3.0
HSAD 332 [WI]	Health-Care Marketing	3.0
HSAD 334	Management of Health Services	3.0
HSAD 335 [WI]	Health-Care Policy	3.0
HSAD 340	Leadership in Health Services Administration	3.0

HSAD 345	Ethics in Health Care Management	3.0
Business Courses		
ACCT 110	Accounting for Professionals	4.0
Complete 1 of the following ECON courses:		4.0
ECON 201	Principles of Microeconomics	
ECON 202	Principles of Macroeconomics	
ECON 240	Economics of Health Care Systems	
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 201	Introduction to Business Statistics	4.0
or STS 345	Statistics for the Health Sciences	
Humanities and Social Sciences		
PSCI 110	American Government	4.0
SOC 101	Introduction to Sociology	3.0
Health Services Administration (HSAD) Electives [*]		**27.0**
Humanities and Social Sciences Electives		**29.0**
Free Electives		**40.0**
Total Credits		180.0-184.0

[*] HSAD 316 Health Care across Cultures, HSAD 325 Issues in the Health Care System, and HSAD 320 Managed Health Care are recommended electives.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Four Year Year Co-op and Spring/Summer Cycle

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
SOC 101	Introduction to Sociology	3.0
ACCT 110	Accounting for Professionals	4.0
UNIV NH101	The Drexel Experience	1.0

Natural Science course with laboratory[*]		4.0-5.0
	Term Credits	15.0-16.0
Term 2		
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 101 or 171	Introduction to Analysis I Introduction to Analysis A	3.0-4.0
PSCI 110	American Government	4.0
Natural Science courses with laboratory[*]		4.0-5.0
	Term Credits	14.0-16.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 102 or 172	Introduction to Analysis II Introduction to Analysis B	3.0-4.0
HSAD 210	Health-Care Ethics I	3.0
HSAD 310	Introduction to Health-Systems Administration	3.0
	Term Credits	13.0-14.0
Term 4		
CS 150	Computer Science Principles	3.0
HSAD 322	Health-Care Law	3.0
HSAD 334	Management of Health Services	3.0
Humanities/Social Science elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 5		
ECON 240	Economics of Health Care Systems	4.0
HSAD 321	Health-Care Human Resources	3.0
HSAD 330	Financial Management in Health Care	3.0
Health Services Administration (HSAD) elective		3.0
Humanities/Social Science elective		3.0
	Term Credits	16.0
Term 6		
HSAD 335 [WI]	Health-Care Policy	3.0
HSAD 340	Leadership in Health Services Administration	3.0
HSAD 345	Ethics in Health Care Management	3.0
Free electives		6.0
	Term Credits	15.0
Term 7		
Health Services Administration (HSAD) elective		6.0
Humanities/Social Science electives		6.0
Free electives		3.0
	Term Credits	15.0
Term 8		
ORGB 300 [WI]	Organizational Behavior	4.0
Health Services Administration (HSAD) elective		3.0
Humanities/Social Science elective		3.0
Free electives		6.0
	Term Credits	16.0
Term 9		
HSAD 332 [WI]	Health-Care Marketing	3.0
Health Services Administration (HSAD) elective		3.0
Humanities/Social Science elective		3.0
Free electives		6.0
	Term Credits	15.0
Term 10		
HSAD 331 [WI]	Non-profits and Health Care	3.0
STS 345	Statistics for the Health Sciences	4.0
Health Services Administration (HSAD) elective		3.0
Humanities/Social Science electives		3.0

Free electives		3.0
	Term Credits	16.0
Term 11		
Health Services Administration (HSAD) electives		6.0
Humanities/Social Science elective		6.0
Free elective		3.0
	Term Credits	15.0
Term 12		
Health Services Administration (HSAD) electives		3.0
Humanities/Social Science elective		3.0
Free electives		9.0
	Term Credits	15.0

Total Credit: 180.0-184.0

[*]   Students may select from Biology (BIO), Chemistry (CHEM) or Anatomy (ANAT) courses. However, any course selected must include a laboratory component. Additional natural science subject options may be considered with the approval of the student's advisor.

Health Services Administration Faculty

Jesse Ballenger, PhD *(Case Western Reserve University)*. Associate Teaching Professor. Healthcare, medicine and ethics; aging and neurodegenerative diseases; Science and Technology Studies.

Merritt Brockman, DHA, FACHE *(Medical University of South Carolina)*. Assistant Teaching Professor. Patient centered medical home; improvements in health care delivery.

Fred DiCostanzo, EdD *(Rutgers University)*. Assistant Professor. Organizational leadership, Healthcare Management, Human resources and team effectiveness

Stephen F. Gambescia, PhD, MEd, MBA *(Temple University)*. Professor. Health care policy, nonprofits and health care, and health care management and leadership.

Kevin Mitchell, PhD, MBA *(Walden University)*. Assistant Teaching Professor. Health Services Administration; continuous quality improvement, strategic health care management. Research interests include health disparities in vulnerable population, evidenced based medicine and clinical pharmacology and therapeutics.

Marina Moses, MS, DrPH *(Columbia University)*. Assistant Professor. Health administration; healthcare policy; nonprofit association management; sustainability.

Kristine A. Mulhorn, PhD *(University of Delaware) Chair, Department of Health Administration*. Professor. Disablity and aging; cross-national methods of functioning.

Sharrona Pearl, PhD *(Harvard University)*. Associate Professor. Medical ethics; science studies; history of science and medicine; critical race, gender, and disability studies; media studies.

Constance Karin Perry, PhD, EMT *(University of Buffalo)*. Associate Professor. Biomedical ethics and ethical theory. Research interests include autonomy, personhood, feminist ethics, the ethics of animal experimentation, and ethical issues in reproduction and pregnancy.

Hospitality Management

Major: Hospitality Management
Degree Awarded: Bachelor of Science in Hospitality Management (BSHM)

Calendar Type: Quarter
Total Credit Hours: 183.0
Co-op Options: Three Co-op (Five years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 52.0901
Standard Occupational Classification (SOC) code: 11-9051; 11-9081

About the Program

The hospitality management major at Drexel University prepares students for leadership positions in the lodging, food service, and tourism and gaming industries. It also provides the necessary foundation for graduate school.

The hospitality management program recognizes the critical importance of an interdisciplinary education with a global perspective for tomorrow's leaders and managers. Committed to building student knowledge across functional areas and contributing disciplines, the program allows for increased specialization with elective coursework in the following areas:

- Food and Beverage Management
- Gaming and Resort Management
- Travel and Tourism
- Hotel Administration
- Meeting and Event Planning

Home to one of the top hospitality programs in the region, Drexel prides itself on its reputation for progressive, high-quality education. The thriving metropolis of Philadelphia serves as the learning lab for these unique programs. As the sixth largest city in the United States, Philadelphia is in the midst of a restaurant renaissance featuring world-class cuisine and entertainment. Student-focused faculty members are recognized for their professional affiliations, research, published work, and above all, teaching.

Students also receive a business administration minor and have 24.0 credits of free elective to pursue a second minor option.

For more information, visit the Hospitality Management Program's (https://drexel.edu/fhm/academics/Hospitality-and-Tourism/) website.

Program Delivery Options

Drexel's BS in Hospitality Management degree includes courses in the liberal arts, the humanities, language, sciences, hospitality management and culinary arts. A business administration minor is also included. The BS degree can be completed on a full-time or part-time basis:

Four plus One option BS/MBA combined degree, with co-op experience:

This option combines the four-year BS degree followed by the one-year Professional MBA to qualify freshmen applicants. Incoming freshmen will generally have a minimum of 1300 on the SAT, a GPA of 3.5 or higher, and be in the top 10% of their high school graduating class. For MBA requirements visit the LeBow College Professional MBA (http://www.lebow.drexel.edu/academics/graduate/drexel-lebow-mba/) website.

Five-year option, with three co-op experiences:

This option allows students to pursue a variety of professional experiences in the industry including the option to co-op abroad.

Full-time Status Evening option without co-op experience:

To be eligible, students should have a minimum of two years full-time work experience related to students' majors, and a minimum of one year of college level work. Full-time students are eligible for full-time financial aid packages.

Part-time option without co-op experience:

Students work closely with academic advisors to develop a customized plan of study toward degree completion.

American University in Rome:

Every three years, the Drexel hospitality management faculty participate in a study and teach abroad experience. Students are invited to spend the fall semester abroad in Rome, Italy and earn 18.0 credits. Students take two Hospitality related courses taught by a Drexel professor and two additional courses at AUR of their choosing. All course instruction is in English, but a term of ITAL 101 *Italian I* is a pre-requisite for the experience. More information can be found on the Study Abroad website.

London option:

Students are invited to spend a term in their sophomore, junior or senior year in the Study Abroad Program (http://www.drexel.edu/studyabroad/), Drexel in London, while earning up to 18.0 credits. The program's emphasis is on the global implications of and opportunities within the hospitality industry.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COM 181	Public Relations Principles and Theory	3.0
COM 230	Techniques of Speaking	3.0
COM 270 [WI]	Business Communication	3.0
COOP 101	Career Management and Professional Development	0.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
INFO 101	Introduction to Computing and Security Technology	3.0
MATH 107	Probability and Statistics for Liberal Arts	3.0
MATH 181	Mathematical Analysis I	3.0
MATH 182	Mathematical Analysis II	3.0
NFS 101	Introduction to Nutrition & Food	1.0
NFS 100	Nutrition, Foods, and Health	2.0
UNIV SH101	The Drexel Experience	1.0
Arts and Humanities Electives [*]		**15.0**
Social Science Electives [**]		**9.0**
Hospitality Major Requirements		
CULA 115	Culinary Fundamentals	3.0
FDSC 100	ServSafe	1.0
HRM 110	Introduction to the Hospitality Industry	3.0

HRM 120	Principles of Food-Service Management	3.0
HRM 125	Hotel Operations Management	3.0
HRM 130	Introduction to Tourism	3.0
HRM 131	Tourism Geography	3.0
HRM 150	Food & Beverage Customer Service	3.0
HRM 155	Hotel Customer Service	3.0
HRM 160	Laws of the Hospitality Industry	3.0
HRM 165	Introduction to the Events Industry	3.0
HRM 215	Commercial Food Production	4.0
HRM 330	Hospitality Marketing and Branding	3.0
HRM 335	Beverage Management	3.0
HRM 355	Resort Management	3.0
HRM 370	Gaming and Casino Management I	3.0
HRM 371	Gaming and Casino Management II	3.0
HRM 425	Hospitality Industry Administration	3.0
HRM 450	Hospitality Leadership Seminar	3.0
HRM 455	Hospitality Human Resources Management	3.0
Industry Hours Requirements		
HRM 190	Industry Hours I	1.0
HRM 290	Industry Hours II	1.0
HRM 390	Industry Hours III	1.0
HRM 490	Industry Hours IV	1.0
HRM 495	Industry Hours V	1.0
Program Electives ***		**12.0**
Business Administration Minor Requirement		
ACCT 110	Accounting for Professionals	4.0
ECON 201	Principles of Microeconomics	4.0
MIS 200	Management Information Systems	4.0
MKTG 201	Introduction to Marketing Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
Complete one of the following courses to complete the BA minor:		
BLAW 201	Business Law I	4.0
or ECON 202	Principles of Macroeconomics	
or OPM 200	Operations Management	
or STAT 201	Introduction to Business Statistics	
Free Electives		**24.0**
Total Credits		183.0

*   Three language courses are required from: ARBC, CHIN, FREN, GER, GREC, ITAL, JAPN, KOR, RUSS, or SPAN and then one additional arts & humanities course from any of the above as well as ENGL, GST, HIST, HUM, JUDA, LANG, LING, PHIL, WGST, or WRIT areas.

** Students may choose from ANTH, CJS, PSCI, PSY, and SOC courses.

*** Choose additional Hospitality courses or courses from CULA or SMT.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

5 YR UG Co-op Concentration

Term 1

		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
HRM 110	Introduction to the Hospitality Industry	3.0
HRM 130	Introduction to Tourism	3.0
HRM 190	Industry Hours I	1.0
MATH 181	Mathematical Analysis I	3.0
UNIV SH101	The Drexel Experience	1.0
	Term Credits	14.0
Term 2		
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
HRM 131	Tourism Geography	3.0
HRM 150	Food & Beverage Customer Service	3.0
MATH 182	Mathematical Analysis II	3.0
Arts & Humanities Elective		4.0
	Term Credits	16.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
HRM 165	Introduction to the Events Industry	3.0
HRM 125	Hotel Operations Management	3.0
MATH 107	Probability and Statistics for Liberal Arts	3.0
Arts & Humanities Elective		4.0
	Term Credits	17.0
Term 4		
CULA 115	Culinary Fundamentals	3.0
FDSC 100	ServSafe	1.0
HRM 120	Principles of Food-Service Management	3.0
HRM 220	Purchasing for the Hospitality Industry	3.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
Arts & Humanities		4.0
	Term Credits	17.0
Term 5		
COM 230	Techniques of Speaking	3.0
HRM 155	Hotel Customer Service	3.0
HRM 160	Laws of the Hospitality Industry	3.0
HRM 215	Commercial Food Production	4.0
HRM 290	Industry Hours II	1.0
Arts & Humanities Elective		3.0
	Term Credits	17.0
Term 6		
ACCT 110	Accounting for Professionals	4.0
HRM 370	Gaming and Casino Management I	3.0
HRM 390	Industry Hours III	1.0
MKTG 201	Introduction to Marketing Management	4.0
Free elective		3.0
	Term Credits	15.0
Term 7		
HRM 330	Hospitality Marketing and Branding	3.0
HRM 371	Gaming and Casino Management II	3.0
MIS 200	Management Information Systems	4.0
Free elective		3.0
Arts and Humanities elective		3.0
	Term Credits	16.0
Term 8		
HRM 355	Resort Management	3.0
INFO 101	Introduction to Computing and Security Technology	3.0
Program Elective		3.0
Social Science Elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 9		
COM 181	Public Relations Principles and Theory	3.0
ECON 201	Principles of Microeconomics	4.0

HRM 335	Beverage Management	3.0
HRM 490	Industry Hours IV	1.0
Program elective		3.0
Free elective		3.0
	Term Credits	17.0
Term 10		
HRM 450	Hospitality Leadership Seminar	3.0
HRM 495	Industry Hours V	1.0
ORGB 300 [WI]	Organizational Behavior	4.0
Program elective		3.0
Free elective		3.0
	Term Credits	14.0
Term 11		
HRM 425	Hospitality Industry Administration	3.0
Free elective		3.0
Business elective		4.0
Social Science elective		3.0
	Term Credits	13.0
Term 12		
HRM 455	Hospitality Human Resources Management	3.0
Program elective		3.0
Social Science elective		3.0
Free elective		3.0
	Term Credits	12.0

Total Credit: 183.0

Facilities

The major facility of the Hospitality Management, Culinary Arts and Food Science programs is located on the sixth floor of the Academic Building. It is a 6,500 square foot space that includes three state-of-the-art commercial kitchens, bakery and laboratories, as well as the Academic Bistro (http://www.drexel.edu/hsm/about/academic-bistro/), the student-run restaurant, bar and lounge. The facility also includes a sensory analysis lab, hospitality and gaming lab, conference room and the Les Dames d'Escoffier Library.

Philadelphia Location

A unique feature of the Hospitality Management program at Drexel is that it is located in Philadelphia, with close proximity to New York City, Baltimore, and Washington, as well as the resort centers on the Atlantic seacoast and in the Pocono Mountains. These regions include hundreds of hotels, restaurants, resorts, and casinos that are used for field trips and campus visits by hospitality resource professionals. Students also gain hands-on experience through faculty-directed field trips throughout the region.

Hospitality Management Faculty

Michael Traud, JD *(Villanova University) Program Director, Hospitality and Tourism Management.* Assistant Clinical Professor. Implementation of Korean Cuisine in the United States; hospitality law; Italian cuisine.

Nursing

Major: Nursing
Degree Awarded: Bachelor of Science Degree in Nursing (BSN)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Two year transfer student option only)
Classification of Instructional Programs (CIP) code: 51.3801

Standard Occupational Classification (SOC) code: 29-1141

About the Program

The BS in Nursing (BSN) is a full-time, four year option with one, 6 month co-op experience in the third year of study. There is also a five year program which offers three paid, six-month co-op experiences. For eligible transfer students there is a no co-op option which allows students to complete the nursing coursework in two full academic years. Students graduate with a bachelor of science in nursing and are eligible to sit for the RN licensure examination.

The BS in Nursing degree is approved by the Pennsylvania State Board of Nursing and the American Association of Colleges of Nursing.

Drexel's nursing curriculum is built to respond to the rapidly changing health care system, as well as to student's needs. The graduate of the Bachelor of Science in Nursing Program of Drexel University is prepared to:

- Apply concepts from liberal arts to nursing practice.
- Demonstrate leadership behaviors that enhance patient safety and quality care.
- Apply research-based evidence to nursing practice.
- Integrate technology to support clinical decision making in patient-centered care.
- Examine healthcare policy and financial/regulatory environments that influence the delivery of healthcare.
- Foster caring and collaborative relationships with self, patient, and the healthcare community that provide positive outcomes .
- Practice culturally congruent care that addresses health promotion and disease prevention.
- Assimilate ethical principles and professional standards into practice using evidence-based clinical judgment.
- Apply age-specific knowledge to provide safe, competent care across the lifespan.
- Pursue lifelong learning as a means to enhance practice.

A BSN is awarded at the completion of the program.

For more information about the BSN with Co-Op option at Drexel, visit the Nursing Co-Op Program (https://drexel.edu/cnhp/academics/undergraduate/bsn-nursing-co-op/) page.

Degree Requirements

Students should contact their Academic Advisor for any changes to their plans of study prior to registration due to ongoing curriculum updates.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General requirements

CIVC 101	Introduction to Civic Engagement	1.0

UNIV NH101	The Drexel Experience	1.0
English Sequence		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
Biology/Nutrition courses		
BIO 226	Microbiology for Health Professionals	5.0
NFS 220	Normal & Lifespan Nutrition	4.0
NFS 315	Nutrition in Chronic Disease	4.0
Chemistry courses		
CHEM 103	General Chemistry III	5.0
CHEM 108	Health Chemistry I	3.0
Humanities and Social Science courses		
ECON 240	Economics of Health Care Systems	4.0
HSAD 210	Health-Care Ethics I	3.0
PSY 101	General Psychology I	3.0
PSY 120	Developmental Psychology	3.0
SOC 101	Introduction to Sociology	3.0
Language Requirement [*]		**4.0**
Mathematics/Data Analysis courses		
MATH 101	Introduction to Analysis I [**]	4.0
STS 345	Statistics for the Health Sciences	4.0
Anatomy courses		
ANAT 101	Anatomy & Physiology I	5.0
ANAT 102	Anatomy & Physiology II	5.0
ANAT 103	Anatomy & Physiology III	5.0
Nursing courses		
NURS 120	Contemporary Health Care	3.0
NURS 121	Relationship-Based Nursing Care	3.0
NURS 220	Foundations of Nursing Practice	8.0
NURS 221	Concepts of Pathophysiology in Nursing	3.0
NURS 222	Medication Principles	3.0
NURS 320	Health and Illness Concepts I	6.0
NURS 321	Health and Illness Concepts II	6.0
NURS 322	Concepts of Mental Health Nursing	6.0
NURS 323	Nursing Pharmacology Concepts I	3.0
NURS 326	Reproductive Health Across the Lifespan	6.0
NURS 327	Population Health Concepts	6.0
NURS 328	Pediatric Health Concepts	6.0
NURS 329	Nursing Pharmacology Concepts II	3.0
NURS 420	Health and Illness Concepts III	6.0
NURS 421	Holistic Gerontological Nursing	6.0
NURS 422	Leadership Concepts in Nursing	3.0
NURS 423 [WI]	Research Basis of Nursing Practice	4.0
NURS 495	Comprehensive Nursing Concepts	3.0
Electives		
Humanities electives		3.0
Social Science electives		3.0
Nursing electives		9.0
Free electives		6.0
Total Credits		180.0

[*]   Students must take one approved language course, as determined by student's Academic Advisor

[**]   Or other mathematics equivalent by placement exam.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plans of Study

Students should contact their Academic Advisor for any changes to their plans of study prior to registration due to ongoing curriculum updates.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
ANAT 101	Anatomy & Physiology I	5.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101 [*]	Introduction to Analysis I	4.0
NURS 120	Contemporary Health Care	3.0
UNIV NH101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
ANAT 102	Anatomy & Physiology II	5.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
SOC 101	Introduction to Sociology	3.0
PSY 101	General Psychology I	3.0
Language Requirement		4.0
	Term Credits	18.0
Term 3		
ANAT 103	Anatomy & Physiology III	5.0
BIO 226	Microbiology for Health Professionals	5.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
NURS 121	Relationship-Based Nursing Care	3.0
	Term Credits	17.0
Term 4		
NURS 221	Concepts of Pathophysiology in Nursing	3.0
ECON 240	Economics of Health Care Systems	4.0
CHEM 108	Health Chemistry I	3.0

Social Science Elective		3.0
	Term Credits	13.0
Term 5		
NURS 220	Foundations of Nursing Practice	8.0
NURS 222	Medication Principles	3.0
CHEM 103	General Chemistry III	5.0
	Term Credits	16.0
Term 6		
NURS 320	Health and Illness Concepts I	6.0
NURS 323	Nursing Pharmacology Concepts I	3.0
PSY 120	Developmental Psychology	3.0
	Term Credits	12.0
Term 7		
NFS 220	Normal & Lifespan Nutrition	4.0
NURS 321	Health and Illness Concepts II	6.0
NURS 329	Nursing Pharmacology Concepts II	3.0
Humanities Elective		3.0
	Term Credits	16.0
Term 8		
HSAD 210	Health-Care Ethics I	3.0
STS 345	Statistics for the Health Sciences	4.0
NURS 322	Concepts of Mental Health Nursing	6.0
Free Elective		3.0
	Term Credits	16.0
Term 9		
NURS 423 [WI]	Research Basis of Nursing Practice	4.0
NURS 326	Reproductive Health Across the Lifespan	6.0
NFS 315	Nutrition in Chronic Disease	4.0
Free Elective		3.0
	Term Credits	17.0
Term 10		
NURS 422	Leadership Concepts in Nursing	3.0
NURS 421	Holistic Gerontological Nursing	6.0
Nursing elective		3.0
	Term Credits	12.0
Term 11		
NURS 327	Population Health Concepts	6.0
NURS 328	Pediatric Health Concepts	6.0
Nursing elective		3.0
	Term Credits	15.0
Term 12		
NURS 420	Health and Illness Concepts III	6.0
NURS 495	Comprehensive Nursing Concepts	3.0
Nursing Elective		3.0
	Term Credits	12.0

Total Credit: 180.0

* Or other mathematics equivalent by placement exam.

About the Co-op

Cooperative education was designed to provide students with real-world experience in a variety of professional settings before graduation. Co-op integrates full-time work experience in the student's field of study throughout the academic program. The College of Nursing and Health Professions co-op program is one of only two of its kind in the nation.

The nursing co-op provides students with 18 months of cooperative education in addition to the traditional clinical educational experiences.

Through co-op, students will have the opportunity to learn the role of the nurse and unlicensed assistive personnel as well as other daily professional, political, and social issues in a work environment. Both before and during co-op, students will receive instruction on career management and professional development skills, such as résumé writing, job searches, interviewing skills, maintaining a career portfolio, negotiating salary, and professional behavior in the workplace. The clinical background students gain from co-op, coupled with a knowledge of career management, makes the Drexel option a value-added model of nursing education.

Co-op Descriptions

First Experience
Co-op I: Nursing in Contemporary Health Networks
Students will have cooperative education experiences in managed care settings, pharmaceutical companies, and other non-traditional healthcare work environments where nurses and nursing can effect change. Students will either work under the direction of a professional nurse or another health care professional with a minimum of a baccalaureate degree. Students will not perform any basic nursing skills in this role.

Second Experience
Co-op II: Acute and Chronic Health and Illness
Students on the 4-year track participate in Co-Op II, an education experience in the traditional health care environment that emphasize the delivery of nursing care to adults and adolescents with acute and chronic illnesses. The majority of placements will be in general and specialty medical-surgical units. Students will function in the role as an unlicensed assistive person and their job description will be modeled similarly to unlicensed assistive personnel or nursing externs.

Third Experience
Co-op III: Specialty Nursing Concentration
Students will have cooperative education experiences in a specialty area of their choice which will build upon their previous clinical courses and work experiences. For example, students may elect to specialize in labor and delivery, critical care, or return to work for a pharmaceutical or managed care company. Selection of content area for the Co-op III site will be made by each student in consultation with the student's faculty advisor. Students will be given a suggested reading list and texts to be used for supplemental reading and learning for the specialty co-op area. Students will function in the role as an unlicensed assistive person and their job description will be modeled similarly to the role of unlicensed assistive personnel or nursing externs.

Clinical Affiliations
Clinical Placement Sites

The Undergraduate Nursing Programs have an extensive network of clinical placement sites, including:

11th Street Family Health Services
Abington Memorial Hospital
Albert Einstein Medical Center
ARC
Althea Wright House
Belmont Center
Bryn Mawr Hospital
Paoli Hospital
Casa Farnese
Catholic Social Services
Center for Urban Development
Cooper University Hospital
Chandler Hall

Chestnut Hill Hospital
CHOP (Children's Hospital of Philadelphia)
Christiana Care (Wilmingon Hospital)
Chester County Hospital
Crozer-Chester Medical Center
Delaware County Memorial Hospital
Devereaux Children's Behavioral Health Center
Doylestown Hospital
Fairmount Behavioral Health
Fox Chase Cancer Center
Foulkeways at Gwynedd
Friends Hospital
Gladys B Jacobs
Good Shepherd Penn Partners
Gray Manor
Harrison Community Center
Holy Redeemer Hospital and Medical Center
Hospital of the University of Pennsylvania
Inspira Medical Center
Jefferson Bucks, Jefferson Torresdale
Jefferson Stratford Hospital
Kirkbride Center
Landsdale Hospital (Abington Health)
Lankenau Hospital
Lourdes Medical Center
Masonic Homes
Mercy Hospital
Methodist Hospital
Moss Rehab - AEMC
Nazareth Hospital
Norris Suare
North East Treatment Centers
Our Brother's Place
Our Lady of Lourdes
Paul's Run
Pediatria
Pennsylvania Hospital
Philadelphia School District
Presbyterian Medical Center
Rejuvenations at Fair Acres
Riddle Memorial Hospital
School District of Philadelphia
St. Christopher's Hospital for Children
St. John's Hospice
St. Joseph's Manor
St. Joseph's Villa
St. Mark's
St. Mary's Medical Center
S.H.A.R.E.
Shriners Hospital for Children
SPIN, Inc.
Spring Hospital
Sunday Breakfast
Taylor Hospital
Temple University Hospital
Temple Children's Hospital
Thomas Jefferson University Hospital
United Methodist Communities
Village of Arts and Humanities
Virtua Health (Voorhees, Marlton, Memorial)
Watermark
West Popular Community Center

Willowcrest
Yorktown Manor
YMCA

Nursing Faculty

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Mary Ann Zimmer, RN, MSN, CPN *(Villanova University)*. Assistant Clinical Professor. Pediatrics, adult medical-surgical nursing, nursing education.

Nursing (BSN) - Accelerated Career Entry (ACE)

Major: Nursing
Degree Awarded: Bachelor of Science Degree in Nursing (BSN)
Calendar Type: Quarter
Total Credit Hours: 220.0
Co-op Options: No Co-op
Classification of Instructional Programs (CIP) code: 51.3801
Standard Occupational Classification (SOC) code: 29-1141

About the Program

Drexel University offers the Accelerated Career Entry Option (https://www.drexel.edu/cnhp/academics/undergraduate/Accelerated-Career-Entry-to-Nursing-Program/), a one-year intensive nursing program for students who already have bachelor's or graduate degrees. The program is ideal for working adults or college graduates who want to change careers and earn a new degree in one year. This innovative program is geared to students who will benefit from intense education in nursing science rather than the traditional program, which takes three or four years.

Like their counterparts in the traditional baccalaureate nursing program, graduates of the accelerated program emerge with a set of skills that will serve them well in their chosen profession. Our graduates:

- Utilize the growing compendium of knowledge and information sources from nursing and other disciplines to learn, teach, heal the sick, and conserve health.
- Contribute to the profession by sharing knowledge and skills with clients, peers, and other professionals in a variety of methods.
- Utilize multiple technologies that access and manage information to guide professional practice.
- Participate in culturally sensitive health promotion activities that contribute to the community's health and wellness.
- Participate in ongoing educational activities related to personal growth, professional practice, and community service.
- Apply knowledge and skills appropriate to their selected areas of career clinical practice.
- Develop personal potential for leadership in a changing health care environment.
- Integrate ethical concepts and principles, The Code of Ethics for Nurses, and professional standards into practice within professional, academic, and community settings.
- Utilize critical-thinking skills to improve the health outcomes of patients, families, and communities across the continuum of care.

Admission requirements/Prerequisites

Candidates for admission must be college graduates with a 3.0 overall GPA or a 3.0 GPA in their most-recent 60 semester hours of coursework completed. Admitted students must complete all prerequisites before

continuing with the program. Applicants whose native language is not English and/or were born outside of the United States are required to take both the TOEFL (Test of English as a Foreign Language) and the TSE (Test of Spoken English) and achieve a passing score in each.

Degree Requirements

Prerequisites

The following 8 courses, in semester terms, are prerequisites for the ACE program:

Degree Requirements

Students should contact their Academic Advisor for any changes to their plans of study prior to registration due to ongoing curriculum updates.

Prerequisites:

Chemistry with lab	4.0
Developmental Psychology	3.0
Anatomy with lab *	4.0
Physiology with lab *	4.0
Microbiology with lab *	4.0
Human Nutrition	3.0
Statistics	3.0
English	3.0

* The anatomy, physiology, and microbiology courses must have been taken within five years of beginning the program.

* Drexel University requires 180.0 quarter credits for conferral of a Bachelor's degree. Students will transfer in 134.0 quarter credits, 96.0 quarter credits from their previous Bachelor Degree and 38.0 quarter credits from their pre-requisites totaling 134.0 quarter credits. Upon completion of the NACE and NACT programs they will receive an additional 84.0 quarter credits, bringing the total to 218.0 quarter credits.

NURS 120	Contemporary Health Care	3.0
NURS 121	Relationship-Based Nursing Care	3.0
NURS 220	Foundations of Nursing Practice	8.0
NURS 221	Concepts of Pathophysiology in Nursing	3.0
NURS 222	Medication Principles	3.0
NURS 320	Health and Illness Concepts I	6.0
NURS 321	Health and Illness Concepts II	6.0
NURS 322	Concepts of Mental Health Nursing	6.0
NURS 323	Nursing Pharmacology Concepts I	3.0
NURS 326	Reproductive Health Across the Lifespan	6.0
NURS 327	Population Health Concepts	6.0
NURS 328	Pediatric Health Concepts	6.0
NURS 329	Nursing Pharmacology Concepts II	3.0
NURS 420	Health and Illness Concepts III	6.0
NURS 421	Holistic Gerontological Nursing	6.0
NURS 422	Leadership Concepts in Nursing	3.0
NURS 423 [WI]	Research Basis of Nursing Practice	4.0
NURS 495	Comprehensive Nursing Concepts	3.0
Total Credits		84.0

Sample Plan of Study

First Year

Term 1		Credits
NURS 120	Contemporary Health Care	3.0
NURS 121	Relationship-Based Nursing Care	3.0
NURS 220	Foundations of Nursing Practice	8.0
NURS 221	Concepts of Pathophysiology in Nursing	3.0
NURS 222	Medication Principles	3.0
	Term Credits	20.0
Term 2		
NURS 320	Health and Illness Concepts I	6.0
NURS 322	Concepts of Mental Health Nursing	6.0
NURS 323	Nursing Pharmacology Concepts I	3.0
NURS 421	Holistic Gerontological Nursing	6.0
	Term Credits	21.0
Term 3		
NURS 321	Health and Illness Concepts II	6.0
NURS 326	Reproductive Health Across the Lifespan	6.0
NURS 328	Pediatric Health Concepts	6.0
NURS 329	Nursing Pharmacology Concepts II	3.0
	Term Credits	21.0
Term 4		
NURS 327	Population Health Concepts	6.0
NURS 420	Health and Illness Concepts III	6.0
NURS 422	Leadership Concepts in Nursing	3.0
NURS 423 [WI]	Research Basis of Nursing Practice	4.0
NURS 495	Comprehensive Nursing Concepts	3.0
	Term Credits	22.0

Total Credit: 84.0

Nursing Faculty

Suzan Blacher, PhD, RN, CARN *(Drexel University) RN-BSN Program*. Assistant Clinical Professor. Care of the patient with substance use disorders; stigmatization of addictions.

Beth Chiatti, PhD, RN, CTN, CSN *(Widener University)*. Assistant Clinical Professor. Genetics, transcultural nursing, immigrant health, human rights and global health

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Mary Ann Zimmer, RN, MSN, CPN *(Villanova University)*. Assistant Clinical Professor. Pediatrics, adult medical-surgical nursing, nursing education.

Nursing: RN/BSN Completion Program

Major: Nursing
Degree Awarded: Bachelor of Science Degree in Nursing (BSN)
Calendar Type: Quarter
Total Credit Hours: 180.0 quarter credits (for Registered Nurses)
Co-op Options: None
Classification of Instructional Programs (CIP) code: 51.3801
Standard Occupational Classification (SOC) code: 29-1141

About the Program

The RN/BSN Completion program is an option for nurses from associate degree and diploma nursing programs looking to complete the bachelor of science degree in nursing.

The Bachelor of Science in Nursing program continues the education of registered nurses equipping them with the skills needed for complex healthcare environments. Core courses immerse the student in genetics, evidence based practice, systems thinking, leadership and care coordination. Interactive practice experiences are woven throughout the curriculum using innovative learning technologies (e.g. digital clinical learning environments [DCE], problem-based/video case studies, and global classrooms). Learning how to adopt evidence-based practice to both clinical and leadership roles prepare students to work in inter-professional teams, improve health care systems and patient outcomes.

A BSN is awarded at the completion of the program. Qualified students are encouraged to submatriculate into the MSN program while enrolled in the BSN program.

For more information about this completion program at Drexel, visit the RN/BSN Completion Program (https://www.drexel.edu/cnhp/academics/undergraduate/RN-to-BSN-Completion-Program/) page.

State restrictions (https://online.drexel.edu/about/state-regulations.aspx) may apply.

WASHINGTON
Drexel University is currently unable to admit students living in Washington state to the online RN-BSN program.

The RN to BSN program at Drexel University is accredited by the Commission on Collegiate Nursing Education (http://www.ccneaccreditation.org/).

Admission Requirements/Prerequisites

Admission Requirements

- RN licensure (provisional acceptance will generally be offered pending successful completion of the NCLEX-RN examination)
- Official college transcripts
- College grade point average of 2.0 or better
- High school degree or equivalent

To be eligible for admission to the Bachelor of Science in nursing program, students must have completed 60.0 semester hours (90.0 quarter credits) of college prerequisites, as follows, with a grade of C or better. Students may transfer in up to 135.0 quarter credits. Remaining credits will be evaluated on an individual basis. To graduate, students must have completed 180.0 quarter credits.

The required 60.0 semester hours include:

English (includes one semester of composition)	6.0
Humanities (studio courses not acceptable)	3.0
Anatomy and Physiology	8.0
Microbiology	4.0
Sociology	3.0
Growth and Development	3.0
Psychology	3.0
Nursing	30.0
Total Credits	60.0

Students must be graduates of nursing programs that are both regionally accredited and accredited by the Accreditation Commission for Education for Nursing (ACEN) or the National League for Nursing Commission for Education Accreditation (CNEA). Students who meet the criteria of the Pennsylvania Nursing Articulation Model will receive credit for 30.0 semester hours (45.0 quarter credits) of nursing, which may be applied toward the program entrance requirements.

Degree Requirements

The College of Nursing and Health Professions faculty uses a variety of teaching and learning methods to facilitate the achievement of a student's personal objectives. All RN-BSN courses are offered online and incorporate a variety of innovative, interactive learning technologies. Courses are offered in both asynchronous and synchronous formats that allow the student flexibility in completing coursework over 10 week quarters.

Students should contact their Academic Advisor prior to registration.

TIER 1 COURSES

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
Or transfer in 2 English courses (3 semester credits from a semester school) must include one semester of composition)		
Humanities Electives		3.0
Intro to Sociology		3.0
General Psychology		3.0
Developmental Psychology		3.0
Nursing Electives		45.0
Anatomy & Physiology I & II (w/ Labs)		10.0
Microbiology w/ Lab		5.0
Science Elective		3.0
TIER 2 COURSES		
Into to Computer Science of Communication		3.0
Statistics of the Health Sciences		4.0
Health Care Economics, Macro, or Micro		4.0
Health Care Ethics I or Advanced Health Care Ethics		3.0
Social Science Electives		3.0
Science Electives		6.0
Pharmacology or Advanced Physiology or Pathophysiology		5.0
Open Electives		23.0
TIER 3 COURSES		
NURS 325 [WI]	Critical Issues in Nursing	4.5
NURS 330 [WI]	Nursing Research: Methods and Critical Appraisal for Evidence-Based Practice	4.5
NURS 335	Genetics and Genomics: Application to Nursing Practice	4.5
NURS 340	Transformational Leadership	4.5
NURS 346	Health Assessment	6.0
NURS 380	Complex Systems of Care: Technology, Patient Safety & Quality	6.0
NURS 407 [WI]	Issues in Aging and Longevity	4.5
NURS 460	Population Health: Local & Global	6.0
NURS 465	Senior Capstone in Nursing	4.5
Total Credits		180.0

Sample Plan of Study

The Accelerated RN-BSN program is designed to be completed in 4 terms. Enrollment in Tier III assumes the student has completed an ADN or Diploma program, has passed the NCLEX-RN, and has completed all required coursework in TIER I and TIER II.

TIER III

Term 1		Credits
NURS 325 [WI]	Critical Issues in Nursing	4.5
NURS 335	Genetics and Genomics: Application to Nursing Practice	4.5
NURS 340	Transformational Leadership	4.5
	Term Credits	13.5
Term 2		
NURS 330 [WI] *	Nursing Research: Methods and Critical Appraisal for Evidence-Based Practice	4.5
NURS 380	Complex Systems of Care: Technology, Patient Safety & Quality	6.0
	Term Credits	10.5
Term 3		
NURS 346	Health Assessment	6.0

NURS 407 [WI]	Issues in Aging and Longevity	4.5
	Term Credits	10.5
Term 4		
NURS 460	Population Health: Local & Global	6.0
NURS 465	Senior Capstone in Nursing	4.5
	Term Credits	10.5

Total Credit: 45.0

*   Statistics of Health Sciences is a prerequisite to NURS 330 [WI] Research Basis of Nursing.

Nursing Faculty

Suzan Blacher, PhD, RN, CARN *(Drexel University) RN-BSN Program*. Assistant Clinical Professor. Care of the patient with substance use disorders; stigmatization of addictions.

Beth Chiatti, PhD, RN, CTN, CSN *(Widener University)*. Assistant Clinical Professor. Genetics, transcultural nursing, immigrant health, human rights and global health

Danielle Devine, PhD, RN *(Villanova University)*. Assistant Clinical Professor. Neurology, Critical Care.

Gloria Donnelly, PhD *(Bryn Mawr College) Dean Emerita*. Professor. Nursing education and a variety of mental health topics including assertiveness, stress and change.

Katie Duncan, MSN, AGPCNP-BC *(University of Pennsylvania)*. Assistant Clinical Professor. Adult-gerontology primary care nurse practitioner.

Theresa Fay-Hillier, DrPH, MSN, PMHCNS-BC *(Drexel University)*. Assistant Clinical Professor. Child, adolescent and family mental health nursing.

Maryann Godshall, PhD, RN, CCRN, CPN, CNE *(Duquesne University)*. Associate Clinical Professor. Pediatrics, critical care, nursing education, pediatric burn patients.

Karen Goldschmidt, PhD, RN *(Wilmington University) Department Chair, RN-BSN Completion Department* . Assistant Clinical Professor. Professional issues, nursing education, staff development, scholarly writing.

Maureen Gonzales, MSN, WHNP *(University of Pennsylvania)*. Assistant Clinical Professor. Women's health, high risk obstetrics.

Cynthia Hambach, MSN, RN, CCRN *(Widener University)*. Assistant Clinical Professor. Critical care nursing.

Dana C. Kemery, EdD, MSN, RN, CNE, CEN, CPEN *(Drexel Universiy)*. Assistant Clinical Professor. Emergency nursing (adult and pediatric), nursing education.

Kayann Laughlin, MAHEd, MSN, RN *(Arcadia University)*. Assistant Clinical Professor. Community/public health, administration.

MaryKay Maley, DNP, APN, FNP, RN-BC *(University of Miami)*. Assistant Clinical Professor. Family health, faith community nursing, health promotion/disease prevention and mindfulness-based stress reduction.

Tasha Martin-Peters, MSN, RN *(Duke University)*. Assistant Clinical Professor. Pediatric critical care, pediatric cardiac care.

Pamela McGee, MSN, FNP-BC, CNE *(University of Pennsylvania)*. Assistant Clinical Professor. Medical/surgical nursing, gerontology, primary care, family nurse practitioner.

Kristen McLaughlin, PhD (candidate), MSN, RN, CPNP-PC *(Widener University)*. Assistant Clinical Professor. Pediatric nurse practitioner.

Nancy Murphy, PhD, RN, CNE *(University of Massachusetts Dartmouth)*. Assistant Clinical Professor. Maternal child health, psychiatric/mental health; community, home and public health care.

Maura Nitka, MSN, RN, CPN *(Drexel University)*. Assistant Clinical Professor. Pediatric nursing.

Carol Okupniak, DNP, RN-BC *(Chatham University)*. Assistant Clinical Professor. Nursing informatics, simulation and women's health.

Jennifer Olszewski, EdD, MSN, CRNP, ANP-BC *(Drexel University) Interim Chair of the BSN Nursing Accelerated Career Entry Program*. Assistant Clinical Professor. Adult-gerontology nurse practitioner, dementia care.

Alis Kotler Panzera, DrNP, WHNP-BC, RN *(Drexel University) Director of Nursing Student Success*. Assistant Clinical Professor. Board certified women's health nurse practitioner, reproductive health and female urology.

Penny Parker, MSN, FNP-C, CCTC, CIC *(Drexel University)*. Assistant Clinical Professor. Advanced heart failure and heart/lung transplantation; critical care nursing.

Genevieve Porrecca, MSN, RN, PCCN *(Holy Family University)*. Assistant Clinical Professor. Critical care

Catherine Quay, MSN, RN-BC *(Pace University)*. Assistant Clinical Professor. Board certified gerontology, medical/surgical nursing, dementia.

Leland Rockstraw, PhD, RN *(Drexel University)*. Clinical Professor. Graduate Nursing-Advanced Roles. Adult orthopedic/surgical, emergency care, critical care, and trauma/surgery intensive care and healthcare simulation.

Al Rundio, PhD, DNP, RN, APRN, CARN-AP, NEA-BC, FNAP, FIAAN, FAAN *(Chatham College)*. Clinical Professor. Transference of dependencies from bariatric surgical procedures, relapse prevention in chemically addicted clients.

Deanna Lynn Schaffer, PhD RN, ACNS-BC *(Widener University)*. Assistant Clinical Professor. Recruitment and retention in higher education, nursing leadership, nursing practice environment, and nursing informatics.

Meaghan Shattuck, MSN, RN, OCN *(Holy Family University)*. Assistant Clinical Professor. Oncology certified, medical/surgical nursing and education.

Helen Teng, PhD, RN *(University of Pennsylvania)*. Assistant Clinical Professor. Community health, immigrant health.

Ann Thiel-Barrett, DNP, RN, FNP-BC, CNE *(Chatham University)*. Assistant Clinical Professor. Family health nursing.

Denise Way, DNP, MSN, RN *(Wilmington University)*. Assistant Clinical Professor. Osteoporosis prevention throughout the lifespan.

Joyce Welliver, MSN, CRNP, CAC, RN *(Drexel University) Director of Faculty Role Development and Clinical Performance*. Assistant Clinical Professor. Psychiatric/mental health nursing, adult health

Mary Yost, PhD, RN *(Widener Unirsity) Interim Chair of the BSN Co-Op Program*. Assistant Clinical Professor. Trauma/Critical Car and Emergency Nursing.

Mary Ann Zimmer, RN, MSN, CPN *(Villanova University)*. Assistant Clinical Professor. Pediatrics, adult medical-surgical nursing, nursing education.

Nutrition and Foods

Major: Nutrition and Foods
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 184.5
Co-op Options: One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 30.1901
Standard Occupational Classification (SOC) code: 29-1031

About the Program

The Nutrition and Foods curriculum emphasizes the relationship between food, food choices, nutrient metabolism, and medical nutrition therapy to meet the health and nutrient needs of individuals and groups.

The BS in Nutrition and Foods requires four years of study and the completion of at least 184.5 credits. The curriculum is designed to provide a sound basis for careers in dietetics and the application of the principles of nutrition and food science to the nutritional care of individuals and groups such as in hospitals, community-based nutrition facilities, food or pharmaceutical industries, or food service.

The study of the biochemical nature of nutrients and foods, their interaction with the environment, and their eventual metabolic fate is a strong career path for more research-minded students and provides a unique base for graduate study.

About the Nutrition Program

Dietetics is the practical application of nutrition in the prevention and treatment of disease. Dietetics is an exciting and challenging profession because there are many diseases that are related to nutrition, such as heart disease, high blood pressure, stroke, cancer, diabetes and obesity.

The nutrition program at Drexel University is referred to as a Didactic Program in Dietetics (DPD) because it provides classroom training for students who want to become Registered Dietitians/Nutritionists (RD/RDN). Our Didactic Program in Dietetics is accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND) of the Academy of Nutrition and Dietetics:

Academy of Nutrition and Dietetics
120 South Riverside Plaza
Suite 2000
Chicago, IL 60606
800-877-1600 x5400
www.eatright.org (http://www.eatright.org)

The Academy of Nutrition and Dietetics (https://www.cdrnet.org/) is the nation's largest organization of food and nutrition professionals, most of whom are Registered Dietitians (RD) or Registered Dietitians/Nutritionists (RDN). Note that the "RD" and "RDN" credential are the same credential.

The Academy of Nutrition and Dietetics included the "RDN" to reflect that "all registered dietitians are nutritionists, but not all nutritionists are registered dietitians." In addition, the Academy of Nutrition and Dietetics states that adding the word "nutritionist" to the RD credential allows for a broader notion of wellness.

To become an RD/RDN, students must complete a:

- Minimum of a bachelor's degree with course work approved by ACEND. Course work typically includes nutrition and food sciences, chemistry, biochemistry, physiology, microbiology, community nutrition, nutrition counseling, basic and quantity food preparation, foodservice systems management and medical nutrition therapy. NOTE: As of January 1, 2024, the minimum of a Master's degree will be required to sit for the RDN exam.
- An accredited, supervised practice program, also called a dietetic internship (DI) or Individualized Supervised Practice Pathway (IPP), at health-care facilities, community agencies and in foodservice operations. The internship must provide a minimum of 1200 hours of hands-on training.
- Pass a national examination administered by the Commission on Dietetic Registration.

After successfully completing the BS program in Nutrition and all DPD-required courses with a C or better, students will receive a BS degree and a DPD Verification Statement. The Verification Statement is a certificate documenting completion of an accredited Didactic Program in Dietetics. At this time (prior to 2024), students need both a minimum of Bachelor's degree and a Verification Statement to be eligible for a dietetic internship.

During the senior year, most students apply for admission into a dietetic internship. To have a good chance of getting accepted into a dietetic internship, students should do the following:

- Maintain a cumulative grade point average (GPA) greater than 3.0 (this includes college courses regardless of where taken).
- Work several hundred hours in dietetics-related work and volunteer experience (especially in the food and nutrition departments at hospitals and nursing homes and in community programs such as Women, Infants, and Children [WIC]).
- Participate in activities that demonstrate leadership.

Mission, Goals, and Outcome Measures

Drexel University's Department of Nutrition Sciences, Nutrition and Dietetics Program integrates a foundation in the nutrition sciences with courses in the social sciences to provide the knowledge, skills, and professional values needed for successful entry into dietetic internships, graduate school, or dietetics employment. The learning environment is structured to allow students and interns to use current technology, to participate in conducting research, and to engage in experiential learning, including co-operative education for undergraduates.

GOAL 1

To provide quality didactic instruction and learning experiences to prepare graduates to be accepted into dietetic internships and graduate schools, or work in the field of dietetics.

- Objective #1: Eighty percent of graduating BS students and 90% of graduating MS students will apply to an accredited dietetic internship.

- Objective #2: Eighty percent of students who apply to dietetic internships or Individualized Supervised Practice Pathways (ISPPs) are accepted.
- Objective #3: Seventy-five percent of students who apply to graduate school are accepted.
- Objective #4: Eighty-percent of graduates of the Drexel University ISPP who e will be employed within 6 months of program completion.
- Objective #5: Graduates of the didactic program in dietetics (DPD) will rate 10 aspects of their didactic and learning experiences an average of "4" or better, on a scale of 1=poor to 5=excellent.
- Objective #6: At least 90% of students will complete the program within 150% of the expected time frame for the program (BS-DPD full-time = 4 years; BS-DPD part-time = 5 to 7 years; Masters of Science[MS]-DPD full time = 2 years; MS-DPD part-time = 4 years; ISPP full-time = 3 quarters or 1 year; ISPP part-time = 6 quarters or 2 years.

GOAL 2

To prepare graduates to become competent entry-level dietitians.

- Objective #1: The program's first time pass rate on the entry exam for all tracks (BS-DPD, MS-DPD, and ISPP) will be 80% or higher.
- Objective #2: Internship directors of graduates of the DPD will rate 10 aspects of the students' preparation for internship an average of "4" or better, on a scale of 1=poor to 5=excellent.
- Objective #3: Employers of alumni of the ISPP will rate 10 aspects of the employees' preparation for entry-level practice an average of "4" or better, on a scale of 1=poor to 5=excellent.

GOAL 3

To increase diversity in the profession by recruiting and retaining students from under-represented groups and facilitating their success in the program.

- Objective #1: At least 10% of student in all tracks (BS-DPD, MS-DPD and ISPP cumulatively) will be from under-represented groups.

For more information, visit the College's Nutrition Sciences (https://www.drexel.edu/cnhp/academics/undergraduate/BS-Nutrition-and-Foods/) web page.

Admission/Graduation Requirements

Admission Requirements

Drexel takes into consideration a number of criteria when determining admission, including the applicant's application, transcripts, courses in progress, two letters of recommendation, standardized test scores, essay, and special interests (list of extracurricular activities, employment, etc.). Applicants to the Nutrition and Foods program must have completed three years of high school mathematics (algebra I and II, geometry, and trigonometry) and two years of a laboratory science (biology, chemistry, or physics). Applicants should have a strong interest in, and aptitude for, the basic sciences that are required in the program.

To be considered as a transfer student, candidates should have completed a minimum of 24 college credits. Drexel operates on a rolling admission basis, which means that students will be notified about the admission decision as soon as possible after their files are complete.

Visit the Admissions (http://drexel.edu/undergrad/academics/majors/) web site for more information and to apply online.

Graduation Requirements

To receive a BS in Nutrition and Foods, students in the program must complete a plan of study of all required courses and enough elective courses to total at least 180.0 credits. An overall GPA of 2.0 or higher for all coursework undertaken at Drexel University must be earned to receive a BS. A "C" or better is required in all courses in the Didactic Program in Dietetics to receive a Verification Statement.

For the current academic calendar, visit Drexel University Academic Calendars (http://drexel.edu/provost/calendars/academic-calendars/).

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Communications and English		
COM 230	Techniques of Speaking	3.0
COM 345	Intercultural Communication	3.0
or COM 310	Technical Communication	
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
Physical and Biological Sciences		
ANAT 101	Anatomy & Physiology I	5.0
ANAT 102	Anatomy & Physiology II	5.0
ANAT 103	Anatomy & Physiology III	5.0
BIO 122	Cells and Genetics	4.5
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
CHEM 103	General Chemistry III	5.0
NFS 215	Nutritional Chemistry	3.0
NFS 217	Nutrient Quality & Composition	1.0
Humanities and Social Sciences		
ANTH 101	Introduction to Cultural Diversity	3.0
or SOC 101	Introduction to Sociology	
PSY 101	General Psychology I	3.0
Management and Computing		
CS 161	Introduction to Computing	3.0
HRM 455	Hospitality Human Resources Management	3.0
ORGB 300 [WI]	Organizational Behavior	4.0
Foods, Food Safety, and Food Production		
CULA 115	Culinary Fundamentals	3.0
FDSC 154	Science of Food and Cooking	4.0
FDSC 270	Microbial Food Safety and Sanitation	4.0
FDSC 350	Experimental Foods: Product Development	3.0
HRM 215	Commercial Food Production	4.0
Mathematics and Statistics		
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
STS 345	Statistics for the Health Sciences	4.0
Nutrition and Food Sciences		
NFS 100	Nutrition, Foods, and Health	2.0

NFS 101	Introduction to Nutrition & Food	1.0
NFS 203	Nutrition II: Nutrition in the Lifecycle	4.0
NFS 230	Intermediate Nutrition	4.0
NFS 265	Professional Issues in Nutrition and Foods	3.0
NFS 345	Foods and Nutrition of World Cultures	3.0
NFS 370	Foodservice Systems Management	4.0
NFS 391	Community Nutrition	4.0
NFS 415	Advanced Nutrition I: Macronutrition	4.0
NFS 416	Advanced Nutrition II: Micronutrients	4.0
NFS 431	Nutrition Counseling	4.0
NFS 443	Medical Nutrition Therapy I	3.0
NFS 444	Medical Nutrition Therapy II	3.0
NFS 445	Medical Nutrition Therapy III	3.0
NFS 475	Advanced Seminar in the Dietetics Profession	3.0
NFS 494	Senior Project I	2.0
NFS 495	Senior Project II	2.0
NFS 496	Senior Project III	2.0
Additional Requirements		
UNIV NH101	The Drexel Experience	2.0
Free Electives		**30.0**
Total Credits		184.5

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

BS Nutrition and Foods: 4 YR UG (with one co-op spring/summer junior year)

Term 1		Credits
CHEM 101	General Chemistry I	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
PSY 101	General Psychology I	3.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
UNIV NH101	The Drexel Experience	2.0
	Term Credits	14.5
Term 2		
CHEM 102	General Chemistry II	4.5
CS 161	Introduction to Computing	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 101	Introduction to Analysis I	4.0
	Term Credits	14.5
Term 3		
CHEM 103	General Chemistry III	5.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
FDSC 154	Science of Food and Cooking	4.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	16.0
Term 4		
ANAT 101	Anatomy & Physiology I	5.0
BIO 122	Cells and Genetics	4.5
NFS 230	Intermediate Nutrition	4.0
Free Elective		3.0
	Term Credits	16.5
Term 5		
ANAT 102	Anatomy & Physiology II	5.0
CULA 115	Culinary Fundamentals	3.0
FDSC 270	Microbial Food Safety and Sanitation	4.0
NFS 215	Nutritional Chemistry	3.0
NFS 217	Nutrient Quality & Composition	1.0
	Term Credits	16.0
Term 6		
ANAT 103	Anatomy & Physiology III	5.0
COM 345	Intercultural Communication	3.0
NFS 203	Nutrition II: Nutrition in the Lifecycle	4.0
NFS 265	Professional Issues in Nutrition and Foods	3.0
	Term Credits	15.0
Term 7		
ANTH 101 or SOC 101	Introduction to Cultural Diversity Introduction to Sociology	3.0
COM 230	Techniques of Speaking	3.0
STS 345	Statistics for the Health Sciences	4.0
Free Elective		6.0
	Term Credits	16.0
Term 8		
HRM 215	Commercial Food Production	4.0
FDSC 350	Experimental Foods: Product Development	3.0
NFS 415	Advanced Nutrition I: Macronutrition	4.0
Free Elective		6.0
	Term Credits	17.0
Term 9		
NFS 416	Advanced Nutrition II: Micronutrients	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
Free Elective		6.0
	Term Credits	14.0
Term 10		
NFS 391	Community Nutrition	4.0
NFS 443	Medical Nutrition Therapy I	3.0
NFS 475	Advanced Seminar in the Dietetics Profession	3.0
NFS 494	Senior Project I	2.0
Free Elective		3.0
	Term Credits	15.0
Term 11		

NFS 370	Foodservice Systems Management	4.0
NFS 431	Nutrition Counseling	4.0
NFS 444	Medical Nutrition Therapy II	3.0
NFS 495	Senior Project II	2.0
Free Elective		3.0
	Term Credits	16.0
Term 12		
HRM 455	Hospitality Human Resources Management	3.0
NFS 345	Foods and Nutrition of World Cultures	3.0
NFS 445	Medical Nutrition Therapy III	3.0
NFS 496	Senior Project III	2.0
Free Elective		3.0
	Term Credits	14.0

Total Credit: 184.5

Career Opportunities

Possible career opportunities in dietetics include the following:

- *Clinical Dietitians* are specialists in medical nutrition therapy in hospitals, outpatient clinics, and private practices. They assess patient nutrition, develop dietary plans, provide patient counseling, and monitor patient progress.
- *Community Dietitians* work in public health agencies, health and fitness clubs, Women, Infants, and Children and non-profit organizations with a focus on nutrition. They counsel people on food choices and direct programs in nutrition awareness and disease prevention.
- *Sports Dietitians* work with professional sports teams, Olympic and/or University and College teams. They provide team and individual nutrition counseling, establish fueling stations, work with food service industry during travel, etc.
- *Management Dietitians* specialize in clinical management or food service systems. They work in hospitals, nursing homes, school food service, cafeterias, restaurants, the airline industry, etc. They manage personnel, plan and conduct employee training programs, design food systems, and plan budgets.
- *Business Dietitians* work in the food industry in product development and marketing, public relations, food styling, and menu design.
- *Consultant Dietitians* are independent business people who work as consultants to sports teams, nursing homes, corporations, etc.

Facilities

The Center for Nutrition & Performance, located in the Daskalakis Athletic Center, provides a variety of nutrition services to the Drexel community, including workshops, lectures, support for athletic teams, and individual counseling. An employee weight loss program is available through the Center for Nutrition & Performance The Center for Nutrition & Performance also works with some professional teams, as well as internationally.

Nutrition and Foods Faculty

Nyree Dardarian, MS, RD, LDN, CSSD, FAND *(Drexel University) Director, Center for Nutrition & Performance.* Clinical Assistant Professor. Energy expenditure; sports nutrition

Garrison L. Draper, MSc, CSCS, USAW, ISPAS *(Edith Cowan University, Perth, WA) Courtesy Appointment.* Visiting instructor

Susan Ettinger, PhD, RD, DABN, CDN *(Columbia University) Courtesy Appointment.* Visiting Research Professor.

Susan Fuchs, MS, IBCLC *(Drexel University) Director, Human Lactation Certificate Program.* Clinical Instructor. Human lactation

Joseph Kehayias, PhD *(Indiana University).* Professor. Body composition analyses; measurement of sarcopenia; osteoporosis; energy expenditure.

Beth L. Leonberg, MS, MA, RDN, CSP, FAND, LDN *(Colorado State University, Rowan University) Director, Didactic Program in Dietetics .* Associate Clinical Professor. Pediatric nutrition.

Brandy-Joe Milliron, PhD *(Arizona State University).* Associate Professor. The development and evaluation of modifications in the natural environment to promote healthier living; farm to table school initiatives

Jennifer Nasser, PhD, RD, FTOS *(Rutgers University).* Associate Professor. Dopamine-mediated mechanisms of food intake regulation in humans and its impact on metabolic homeostasis, especially as it applies to obesity, eating disorders and aging.

Kavitha Penugonda, PhD *(Kansas State University) Manager, Nutritional Biochemistry Laboratory.* Assistant Clinical Professor. Nutrient bioavailability in foods; nutritional supplements on health

Jennifer Quinlan, PhD *(North Carolina State University).* Professor. Food microbiology; microbiological quality and safety of produce, dairy and meat products in markets in high vs. low socioeconomics areas, Bacillus and Clostridium spores in food processing.

Vicki Schwartz, DCN, RD, LDN, CNSC, FAND *(Rutgers University).* Assistant Clinical Professor. Clinical nutrition; using standardized patients in nutrition counseling

Patricia A. Shewokis, PhD *(University of Georgia).* Professor. Roles of cognition and motor function during motor skill learning; role of information feedback frequency on the memory of motor skills, noninvasive neural imaging techniques of functional near infrared spectroscopy(fNIRS) and electroencephalograpy (EEG) and methodology and research design.

Deeptha Sukumar, PhD *(Rutgers University).* Associate Professor. Vitamin D and magnesium and bone mineral density; obesity and bone mineral density.

Stella Lucia Volpe, PhD, RD, ACSM-CEP, FACSM *(Virginia Polytechnic Institute and State University) Chair, Nutrition Sciences.* Professor. Prevention of obesity and diabetes across the lifespan; mineral metabolism and exercise; energy balance; sports nutrition.

Emeritus Faculty

Donna H. Mueller, PhD *(Temple University).* Associate Professor Emeritus. Clinical nutrition; pediatric nutrition; nutrition in pulmonary diseases, especially cystic fibrosis; nutrition in developmental delay; dental nutrition; dietetic education and professional development.

Health Sciences BS / Physical Therapy DPT

Major: Health Sciences / Physical Therapy
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 189.5

Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 51.1199
Standard Occupational Classification (SOC) code: 11-9111

About the Program

Drexel's undergraduate Health Sciences program and graduate Physical Therapy (PT) program have partnered to offer an accelerated dual-degree BS/DPT option available to high-achieving students enrolled in the Health Sciences Program. The *Accelerated BS/DPT Option* is an accelerated academic track that enables students to complete their Bachelor of Sciences and Doctor of Physical Therapy degrees in 5.5 years as opposed to the traditional 6.5 years.

Students pursue a BS degree in Health Sciences during their first three years of study, and a DPT degree during their final 2.5 years of study. The bachelor's degree in Health Sciences is awarded following completion of year four (first year of graduate study), and the doctoral degree is awarded following completion of the Physical Therapy program.

For additional information visit the Accelerated BS/DPT Option (https://drexel.edu/cnhp/academics/undergraduate/BS-DPT-Physical-Therapy-Option/) on the Health Sciences page.

Degree Requirements

General Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
UNIV NH101	The Drexel Experience	1.0
English Sequence		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
Biology Sequence		
BIO 122	Cells and Genetics	4.5
BIO 124	Evolution & Organismal Diversity	4.5
BIO 126	Physiology and Ecology	4.5
BIO 226	Microbiology for Health Professionals	5.0
Chemistry Sequence		
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
CHEM 103	General Chemistry III	5.0
Mathematics Sequence		
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
Physics for Life Sciences		
PHYS 152	Introductory Physics I	4.0
PHYS 153	Introductory Physics II	4.0
Communications		
COM 320 [WI]	Science Writing	3.0
Health Systems		
HSAD 210	Health-Care Ethics I	3.0
Select one of the following:		3.0
HSAD 309	Advanced Health-Care Ethics	
HSAD 310	Introduction to Health-Systems Administration	
HSAD 345	Ethics in Health Care Management	
Psychology		
PSY 101	General Psychology I	3.0
One Psychology (PSY) and/or Behavioral Health Counseling (BACS) course (minimum 3 credits)		3.0
Sociology		
SOC 101	Introduction to Sociology	3.0
One Sociology (SOC) course (minimum 3 credits)		4.0
Public Health		
PBHL 101	Public Health 101	3.0
One Public Health (PBHL) course (minimum 3 credits)		3.0
Anatomy & Physiology Courses		
ANAT 101	Anatomy & Physiology I	5.0
ANAT 102	Anatomy & Physiology II	5.0
ANAT 103	Anatomy & Physiology III	5.0
Research Courses		
HSCI 310	Introduction to Research Methods	4.0
HSCI 315	Current Issues in Health Sciences	4.0
Statistics and Assessment		
HSCI 201	Health Assessment through the Lifespan	4.0
STS 345	Statistics for the Health Sciences	4.0
Free Electives		**4.0**
Health Sciences electives (HSCI, PHGY, ANAT, NEUR, NFS) [*]		**19.0**
1st-Year DPT Courses - see DPT curriculum [**]		**49.0**
Total Credits		189.5

[*]   Health Sciences electives include any HSCI, ANAT, PHGY, NEUR or NFS course. Up to two BIO courses may be used as Health Sciences electives with advisor permission. All-100 level freshman course requirements in BIO, CHEM, ENGL, and MATH must be complete by the time a student reaches 135 credits.

[**]   Students receive their BS degree in Health Sciences after successful completion of the Fall, Winter, and Spring term courses in the first year of the DPT curriculum and fulfilling the undergraduate degree requirements.

Sample Plan of Study

Term 1		Credits
BIO 122	Cells and Genetics	4.5
CHEM 101	General Chemistry I	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
UNIV NH101	The Drexel Experience	1.0
Free elective		4.0
	Term Credits	16.0
Term 2		
BIO 124	Evolution & Organismal Diversity	4.5
CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 101	Introduction to Analysis I	4.0
	Term Credits	17.0
Term 3		
BIO 126	Physiology and Ecology	4.5
CHEM 103	General Chemistry III	5.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	16.5
Term 4		
ANAT 101	Anatomy & Physiology I	5.0
BIO 226	Microbiology for Health Professionals	5.0

STS 345	Statistics for the Health Sciences	4.0
Health Science elective		3.0
	Term Credits	17.0
Term 5		
ANAT 102	Anatomy & Physiology II	5.0
HSCI 310	Introduction to Research Methods	4.0
Health Sciences elective		4.0
	Term Credits	13.0
Term 6		
ANAT 103	Anatomy & Physiology III	5.0
COM 320 [WI]	Science Writing	3.0
HSCI 315	Current Issues in Health Sciences	4.0
SOC 101	Introduction to Sociology	3.0
	Term Credits	15.0
Term 7		
COOP 101	Career Management and Professional Development	0.0
HSAD 210	Health-Care Ethics I	3.0
PSY 101	General Psychology I	3.0
Health Sciences elective		4.0
Public Health elective		3.0
Sociology elective		4.0
	Term Credits	17.0
Term 8		
PBHL 101	Public Health 101	3.0
PHYS 152	Introductory Physics I	4.0
One of the following:		3.0
HSAD 309	Advanced Health-Care Ethics	
HSAD 310	Introduction to Health-Systems Administration	
HSAD 345	Ethics in Health Care Management	
Health Sciences elective		4.0
	Term Credits	14.0
Term 9		
HSCI 201	Health Assessment through the Lifespan	4.0
PHYS 153	Introductory Physics II	4.0
Health Sciences elective		4.0
Psychology elective		3.0
	Term Credits	15.0
Term 10		
For terms 10-12 see first year DPT plan of study		49.0
	Term Credits	49.0

Total Credit: 189.5

Health Sciences BS / Physician Assistant MHS

Major: Health Sciences / Physician Assistant
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 186.5
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 51.1199
Standard Occupational Classification (SOC) code: 11-9111

About the Program

Drexel's undergraduate Health Sciences Program and graduate Physician Assistant (PA) Program have partnered to offer an accelerated dual-degree BS/MHS option available to high achieving students enrolled in the Health Sciences Program. The *Accelerated BS/MHS PA Option* is an accelerated academic track that enables students to complete their bachelor's and master's degrees in Health Sciences, including sitting for

the Physician Assistant National Certifying Exam (PANCE), in 5.25 years as opposed to the traditional 6.25 years.

Students pursue a Bachelor of Science degree in Health Sciences during their first three years of study, and a Master of Health Science degree during the final 2.25 years of study. The bachelor's degree in Health Sciences is awarded following completion of year four (first year of graduate study), and the master's degree is awarded following completion of the Physician Assistant Program.

For additional information visit the Accelerated BS/MHS Option (http://www.drexel.edu/cnhp/academics/departments/Health-Sciences/) on the Health Sciences page.

Degree Requirements

General Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
UNIV NH101	The Drexel Experience	1.0
English Sequence		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
Biology Sequence		
BIO 122	Cells and Genetics	4.5
BIO 124	Evolution & Organismal Diversity	4.5
BIO 126	Physiology and Ecology	4.5
BIO 226	Microbiology for Health Professionals	5.0
Chemistry Sequence		
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
CHEM 103	General Chemistry III	5.0
Mathematics Sequence		
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
Communications		
COM 320 [WI]	Science Writing	3.0
Health Systems		
HSCI 125	Medical Terminology	3.0
HSAD 210	Health-Care Ethics I	3.0
Select one of the following:		3.0
HSAD 309	Advanced Health-Care Ethics	
HSAD 310	Introduction to Health-Systems Administration	
HSAD 345	Ethics in Health Care Management	
Psychology		
PSY 101	General Psychology I	3.0
One Psychology (PSY) and/or Behavioral Health Counseling (BACS) course (minimum 3.0 credits)		3.0
Sociology		
SOC 101	Introduction to Sociology	3.0
One Sociology (SOC) course (minimum 3.0 credits)		4.0
Public Health		
PBHL 101	Public Health 101	3.0
One Public Health (PBHL) course (minimum 3.0 credits)		3.0
Anatomy & Physiology Courses		
ANAT 101	Anatomy & Physiology I	5.0
ANAT 102	Anatomy & Physiology II	5.0
ANAT 103	Anatomy & Physiology III	5.0

Genetics

HSCI 337	Genetics and Health	3.0

Research Courses

HSCI 310	Introduction to Research Methods	4.0
HSCI 315	Current Issues in Health Sciences	4.0

Statistics and Assessment

HSCI 201	Health Assessment through the Lifespan	4.0
STS 345	Statistics for the Health Sciences	4.0
Health Sciences electives (HSCI, PHGY, ANAT, NEUR, NFS) [*]		**19.0**
Free electives		**6.0**
1st Year PA Courses: see PA-MHS curriculum		**46.0**
Total Credits		186.5

[*]   Health Sciences electives include any HSCI, ANAT, PHGY, NEUR or NFS course. Up to two BIO courses may be used as Health Sciences electives with advisor permission. All 100-level freshman course requirements in BIO, CHEM, ENGL, and MATH must be complete by the time a student reaches 135 credits.

[**]   Students receive their BS degree in Health Sciences after successful completion of the Fall, Winter, and Spring term courses in the first year of the PA-MHS curriculum and fulfilling the undergraduate degree requirements.

Sample Plan of Study

Term 1		Credits
BIO 122	Cells and Genetics	4.5
CHEM 101	General Chemistry I	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
HSCI 125	Medical Terminology	3.0
UNIV NH101	The Drexel Experience	1.0
	Term Credits	15.0

Term 2		
BIO 124	Evolution & Organismal Diversity	4.5
CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 101	Introduction to Analysis I	4.0
	Term Credits	17.0

Term 3		
BIO 126	Physiology and Ecology	4.5
CHEM 103	General Chemistry III	5.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	16.5

Term 4		
ANAT 101	Anatomy & Physiology I	5.0
BIO 226	Microbiology for Health Professionals	5.0
STS 345	Statistics for the Health Sciences	4.0
Health Sciences elective		3.0
	Term Credits	17.0

Term 5		
ANAT 102	Anatomy & Physiology II	5.0
HSCI 310	Introduction to Research Methods	4.0
PSY 101	General Psychology I	3.0
Health Sciences elective [*]		4.0
	Term Credits	16.0

Term 6

ANAT 103	Anatomy & Physiology III	5.0
COM 320 [WI]	Science Writing	3.0
HSAD 210	Health-Care Ethics I	3.0
HSCI 315	Current Issues in Health Sciences	4.0
	Term Credits	15.0

Term 7		
COOP 101	Career Management and Professional Development	0.0
SOC 101	Introduction to Sociology	3.0
Health Sciences elective		3.0
Psychology Elective		3.0
Sociology elective		4.0
Free elective		3.0
	Term Credits	16.0

Term 8		
One of the following:		3.0
HSAD 309	Advanced Health-Care Ethics	
HSAD 310	Introduction to Health-Systems Administration	
HSAD 345	Ethics in Health Care Management	
HSCI 337	Genetics and Health	3.0
PBHL 101	Public Health 101	3.0
2 Health Sciences electives		6.0
	Term Credits	15.0

Term 9		
HSCI 201	Health Assessment through the Lifespan	4.0
Health Sciences elective		3.0
Public Health elective		3.0
Free elective		3.0
	Term Credits	13.0

Term 10		
For terms 10-12, see MHS-PA plan of study		46.0
	Term Credits	46.0

Total Credit: 186.5

Health Services Administration BS / Public Health MPH

Major: Health Services Administration
Degree Awarded: Bachelor of Science (BS) Master of Public Health (MPH)
Calendar Type: Quarter
Total Credit Hours: 236.0
Co-op Options: One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 51.0701
Standard Occupational Classification (SOC) code: 11-9111

About the Program

The Health Services Administration program and the Master of Public Health program in the Dornsife School of Public Health offer an accelerated dual degree option. Participants can earn both a BS degree in Health Services Administration and a Master of Public Health (MPH) degree in five years.

Students in this accelerated, dual degree program apply to the graduate Masters of Public Health Program (http://catalog.drexel.edu/graduate/schoolofpublichealth/publichealth/) during the fall quarter of their junior year. They then follow the same application procedures as other applicants, including being interviewed by the graduate faculty. (Any student who does not meet the entrance requirements of the graduate program will be able to complete the fourth year of the Health Services Administration program and receive a BS degree.)

Students in the Master of Public Health program complete 56.0 graduate quarter credits to meet the requirements of the master's program. The accelerated, dual degree program represents an acceleration of only the undergraduate portion of the student's curriculum.

For additional information, visit the College of Nursing and Health Professions Accelerated Dual Degree Programs (https://www.drexel.edu/cnhp/academics/undergraduate/BS-MPH-Dual-Degree-Program/) page.

Degree Requirements

Required Courses

BIO 107 & BIO 108	Cells, Genetics & Physiology and Cells, Genetics and Physiology Laboratory	4.0
BIO 109 & BIO 110	Biological Diversity, Ecology & Evolution and Biological Diversity, Ecology and Evolution Laboratory	4.0
CS 161	Introduction to Computing	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
INFO 101	Introduction to Computing and Security Technology	3.0
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
UNIV NH101	The Drexel Experience *	2.0

Core Health Services Administration (HSAD) Courses

HSAD 210	Health-Care Ethics I	3.0
HSAD 310	Introduction to Health-Systems Administration	3.0
HSAD 321	Health-Care Human Resources	3.0
HSAD 322	Health-Care Law	3.0
HSAD 330	Financial Management in Health Care	3.0
HSAD 331 [WI]	Non-profits and Health Care	3.0
HSAD 332 [WI]	Health-Care Marketing	3.0
HSAD 334	Management of Health Services	3.0
HSAD 335 [WI]	Health-Care Policy	3.0
HSAD 340	Leadership in Health Services Administration	3.0
HSAD 345	Ethics in Health Care Management	3.0

Health Services Administration (HSAD) Electives | | **27.0**

HSAD 305	Health Care Law & the Elderly	
HSAD 308	The Affordable Care Act	
HSAD 309	Advanced Health-Care Ethics	
HSAD 312	Development of World Health Care	
HSAD 313	Evolution of Health Care in the United States	
HSAD 315	Interdisciplinary Health Services	
HSAD 316	Health Care across Cultures	
HSAD 317	Religious Views on Health Care	
HSAD 318	Health and Vulnerable Populations	
HSAD 319	Women and the Health Professions	
HSAD 320	Managed Health Care	
HSAD 323	Introduction to Long-Term Care Administration	
HSAD 324	Health Technology and Ethical Responsibility	
HSAD 325	Issues in the Health Care System	
HSAD 326	Holism and Health Care	
HSAD 327	Partnerships in Health Care	
HSAD 328	Health Care for Diverse Groups	
HSAD 329	Health Care and the Media	
HSAD 333	Health, Illness, and the Arts	
HSAD 336	Urban Health Care	
HSAD 337	Health Care/Quality Improvement	
HSAD 341	Risk Management in Healthcare Organizations	

HSAD 342	Children and Health Care	
HSAD 343	Health and Illness in Film	
HSAD 346	Mental Illness in the Media and Arts	
HSAD 351	Ethical Issues in Reproduction	
HSAD 353	Public Health Ethics	
HSAD 357	Health Information Systems	
HSAD 363	Health Care Privacy & Security	
HSAD T180	Special Topics in Health Services Administration	
HSAD T280	Special Topics in Health Services Administration	
HSAD T380	Special Topics in Health Services Administration	
HSAD T480	Special Topics in Health Services Administration	

Required Business Courses

ACCT 110	Accounting for Professionals	4.0
ECON 240	Economics of Health Care Systems	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 201	Introduction to Business Statistics	4.0

Required Humanities and Social Sciences Courses

ANTH 101	Introduction to Cultural Diversity	3.0
COM 111	Principles of Communication	3.0
COM 181	Public Relations Principles and Theory	3.0
COM 230	Techniques of Speaking	3.0
PHIL 105	Critical Reasoning	3.0
PSCI 110	American Government	4.0
PSY 101	General Psychology I	3.0
PSY 120	Developmental Psychology	3.0
PSY 240 [WI]	Abnormal Psychology	3.0
PSY 250 [WI]	Industrial Psychology	3.0
SOC 101	Introduction to Sociology	3.0
SOC 115	Social Problems	4.0
SOC 215	Sociology of Work	4.0
SOC 235	Sociology of Health and Illness	4.0
SOC 271	Sociology of Aging	4.0
Free Electives		10.0

Graduate MPH Program Requirements

PBHL 500	Practical Experience for the Master of Public Health	0.0
PBHL 510	Public Health Foundations and Systems I	4.0
PBHL 511	Public Health Foundations and Systems II	4.0
PBHL 512	Methods for Public Health Research I	4.0
PBHL 513	Methods for Public Health Research II	4.0
MPH Discipline Specific Foundation Courses		15.0
MPH Integrative Learning Experience		4.0-6.0
MPH Electives/Graduate Minor Courses		21.0
Total Credits		225.0-227.0

* UNIV NH101 is taken over two terms.

Sample Plan of Study

Term 1		Credits
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
CS 161	Introduction to Computing	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
SOC 101	Introduction to Sociology	3.0
UNIV NH101	The Drexel Experience	1.0
	Term Credits	14.0
Term 2		
BIO 109	Biological Diversity, Ecology & Evolution	3.0
BIO 110	Biological Diversity, Ecology and Evolution Laboratory	1.0

ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
HSAD 310	Introduction to Health-Systems Administration	3.0
MATH 101	Introduction to Analysis I	4.0
PSY 101	General Psychology I	3.0
UNIV NH101	The Drexel Experience	1.0
	Term Credits	18.0
Term 3		
ACCT 110	Accounting for Professionals	4.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 102	Introduction to Analysis II	4.0
PSY 120	Developmental Psychology	3.0
SOC 235	Sociology of Health and Illness	4.0
	Term Credits	18.0
Term 4		
COM 111	Principles of Communication	3.0
ECON 240	Economics of Health Care Systems	4.0
HSAD 332 [WI]	Health-Care Marketing	3.0
PSCI 110	American Government	4.0
STAT 201	Introduction to Business Statistics	4.0
	Term Credits	18.0
Term 5		
ANTH 101	Introduction to Cultural Diversity	3.0
HSAD 334	Management of Health Services	3.0
INFO 101	Introduction to Computing and Security Technology	3.0
PSY 240 [WI]	Abnormal Psychology	3.0
HSAD electives		6.0
	Term Credits	18.0
Term 6		
COM 181	Public Relations Principles and Theory	3.0
HSAD 210	Health-Care Ethics I	3.0
HSAD 330	Financial Management in Health Care	3.0
HSAD 335 [WI]	Health-Care Policy	3.0
PHIL 105	Critical Reasoning	3.0
Free elective		4.0
	Term Credits	19.0
Term 7		
COM 230	Techniques of Speaking	3.0
HSAD 321	Health-Care Human Resources	3.0
HSAD 322	Health-Care Law	3.0
PSY 250 [WI]	Industrial Psychology	3.0
Free Elective		3.0
HSAD elective		3.0
	Term Credits	18.0
Term 8		
HSAD 345	Ethics in Health Care Management	3.0
ORGB 300 [WI]	Organizational Behavior	4.0
SOC 271	Sociology of Aging	4.0
HSAD electives		6.0
	Term Credits	17.0
Term 9		
SOC 115	Social Problems	4.0
SOC 215	Sociology of Work	4.0
HSAD 331 [WI]	Non-profits and Health Care	3.0
HSAD 340	Leadership in Health Services Administration	3.0
HSAD elective		3.0
	Term Credits	17.0
Term 10		
HSAD elective		3.0
	Term Credits	3.0

Term 11		
Free elective		3.0
HSAD electives		6.0
	Term Credits	9.0
Term 12		
PBHL 500	Practical Experience for the Master of Public Health	0.0
PBHL 510	Public Health Foundations and Systems I	4.0
PBHL 512	Methods for Public Health Research I	4.0
Discipline Specific MPH Course		3.0
MPH Elective		3.0
	Term Credits	14.0
Term 13		
PBHL 511	Public Health Foundations and Systems II	4.0
PBHL 513	Methods for Public Health Research II	4.0
MPH Electives		6.0
	Term Credits	14.0
Term 14		
Integrative Learning Experience I		2.0-3.0
MPH Electives		6.0
Discipline Specific MPH Course		3.0
	Term Credits	11.0-12.0
Term 15		
Integrated Learning Experience II		2.0-3.0
MPH Electives		6.0
Discipline Specific MPH Courses		9.0
	Term Credits	17.0-18.0

Total Credit: 225.0-227.0

Nursing: Accelerated RN/BSN/MSN

Major: Nursing
Degree Awarded: Bachelor of Science in Nursing (BSN) and Master of Science in Nursing (MSN)
Calendar Type: Quarter
Total Credit Hours: 60
Co-op Options: No Co-op (Three years)
Classification of Instructional Programs (CIP) code: 51.1601
Standard Occupational Classification (SOC) code: 29-1141

About the Program

The RN-BSN-MSN Option is a pathway for RNs who have a bachelor's degree in a field other than nursing and are interested in pursuing a fast-track option to complete a BSN and MSN. This program is also available to students who are currently in the Drexel RN to BSN completion program and are interested in continuing their studies to pursue the MSN.

Application

For the following tracks, students submit an application to the MSN program upon admission:

- MSN in Clinical Nurse Leader (http://catalog.drexel.edu/graduate/collegeofnursingandhealthprofessions/clinicalnurseleaderinadulthealthcon/)

- MSN in Clinical Research (http://catalog.drexel.edu/graduate/collegeofnursingandhealthprofessions/clinicalresearchcon/)

- MSN in Nursing Education (http://catalog.drexel.edu/graduate/collegeofnursingandhealthprofessions/nursingedandfacrolecon/)

- MSN in Nursing Innovation (http://catalog.drexel.edu/graduate/collegeofnursingandhealthprofessions/nursinginnovation/)
- MSN in Nursing Leadership in Health Systems Management (http://catalog.drexel.edu/graduate/collegeofnursingandhealthprofessions/nursingleadershipinhealthsystemsmanagementcon/)
- MSN in Quality, Safety and Risk Management (http://catalog.drexel.edu/graduate/collegeofnursingandhealthprofessions/qualitysafetyandriskmanagementinhealthcare/)

Admission Requirements

The students must meet the admission requirements for the MSN program.

Specific admission criteria are outlined on the Admission Requirements RN to BSN to MSN Option (http://drexel.edu/cnhp/academics/graduate/MSN-Bridge/) page.

Student's academic transcript and professional experience are reviewed and credit is applied to meet the degree requirements. Students are awarded both the BSN and MSN at the completion of the program.

*Drexel University is currently unable to admit students living in Washington state to this program.

Additional Information

For more information, contact:

Ms. Jillian Randall
Academic Advisor
jnr56@drexel.edu
267.359.5692

Degree Requirements

Note: MSN Nurse Practitioner concentrations are currently not accepting students in this program.

BSN Courses		
NURS 325 [WI]	Critical Issues in Nursing	4.5
NURS 335	Genetics and Genomics: Application to Nursing Practice	4.5
NURS 460	Population Health: Local & Global	6.0
TGFE 099 Portfolio Assessment		**15.0**
MSN Core Courses		
NURS 500 [WI]	Confronting Issues in Contemporary Health Care Environments	3.0
NURS 502	Advanced Ethical Decision Making in Health Care	3.0
NURS 544	Quality and Safety in Healthcare	3.0
RSCH 503	Research Methods and Biostatistics	3.0
RSCH 504	Evaluation and Translation of Health Research	3.0
MSN Concentration - select one from the options below		**30.0-41.0**
Total Credits		75.0-86.0

MSN Concentrations (Select one)

Clinical Nurse Leader

NURS 531	Epidemiology in Action: Tracking Health & Disease	3.0
NURS 532	Evaluation of Health Outcomes	3.0
NURS 548	Advanced Pathophysiology	3.0
NURS 549	Advanced Pharmacology	3.0
NURS 550	Advanced Health Assessment & Diagnostic Reasoning	4.0
NURS 564	The Business of Healthcare	3.0
NURS 602	Foundations for Clinical Nurse Leader	4.0
NURS 603	Clinical Nurse Leader Capstone Immersion I	5.0
NURS 604	Clinical Nurse Leader Capstone Immersion II	5.0
Total Credits		33.0

Clinical Trials Research

NURS 548	Advanced Pathophysiology	3.0
NURS 549	Advanced Pharmacology	3.0
NURS 550	Advanced Health Assessment & Diagnostic Reasoning	4.0
NURS 557	Leadership and Stewardship in the Health Professions	3.0
NURS 582	Foundation of Good Clinical Practice in Clinical Trials Mngmt	3.0
NURS 583	Operational Leadership in Clinical Trials Management	3.0
NURS 584	Current Topics in Clinical Trials	3.0
NURS 585	Clinical Trials Research Practicum	5.0
Elective		3.0
Total Credits		30.0

Nurse Educator

NURS 548	Advanced Pathophysiology	3.0
NURS 549	Advanced Pharmacology	3.0
NURS 550	Advanced Health Assessment & Diagnostic Reasoning	4.0
NURS 591	Foundations of Nursing Education	3.0
NURS 606	Curriculum Design for Higher Level Cognition	3.0
NURS 613	The Role and Responsibility of the Nursing Professor	3.0
NURS 615	Assessment, Measurement and Evaluation	3.0
NURS 616	Teaching Methods in Nursing Education	3.0
NURS 632	Nurse Educator and Faculty Role Practicum	6.0
Total Credits		31.0

Nursing Innovation

NURS 564	The Business of Healthcare	3.0
NURS 586	Innovation in Advanced Nursing Practice: Theory and Application	3.0
NURS 587	Case Studies in Intra/Entrepreneurship and Innovation in Nursing	3.0
NURS 652	Innovation Capstone Project	6.0
PROJ 501	Introduction to Project Management	3.0
Electives		12.0-15.0
Total Credits		30.0-33.0

Nursing Leadership in Health Systems Management

NURS 547	Communication and Self-Awareness for Leading and Managing in Healthcare	3.0
NURS 553	Data Analysis for Decision-Making in HC Management	3.0
NURS 557	Leadership and Stewardship in the Health Professions	3.0
NURS 558	Economics of Healthcare Management & Policy	3.0
NURS 559	Operations Management in Contemporary Healthcare Organizations	3.0
NURS 562	Workforce Management in Healthcare Organizations	3.0
NURS 564	The Business of Healthcare	3.0
NURS 567	Strategic Management: Power, Politics and Influence in Healthcare Systems	3.0
NURS 568	Practicum and Symposium in Healthcare Operations Management	3.0
NURS 569	Practicum and Symposium in Technology and Management of Information in Healthcare Organizations	3.0
Total Credits		30.0

Quality, Safety and Risk Management in Healthcare

IPS 501	Legal Compliance: Structure and Implementation	4.5
IPS 504	Regulations in Health Care	4.5
IPS 505	Health Care Quality and the Legal Context	4.5

IPS 506	HIPAA: A Patient's Legal Right to Privacy	4.5
IPS 584	Analysis of Performance Standards in Healthcare Quality	3.0
IPS 585	Science of Safety, Human Factors, and System Thinking	3.0
IPS 586	Creating a Culture of Safety	2.0
IPS 601	Quality, Safety and Risk Management Capstone	5.0
Total Credits		31.0

Sample Plan of Study - Clinical Nurse Leader concentration

First Year

Term 1		**Credits**
NURS 325 [WI]	Critical Issues in Nursing	4.5
NURS 335	Genetics and Genomics: Application to Nursing Practice	4.5
	Term Credits	9.0
Term 2		
NURS 460	Population Health: Local & Global	6.0
	Term Credits	6.0
Term 3		
NURS 548	Advanced Pathophysiology	3.0
NURS 549	Advanced Pharmacology	3.0
	Term Credits	6.0
Term 4		
NURS 502	Advanced Ethical Decision Making in Health Care	3.0
NURS 500 [WI]	Confronting Issues in Contemporary Health Care Environments	3.0
	Term Credits	6.0

Second Year

Term 5		
RSCH 503	Research Methods and Biostatistics	3.0
NURS 544	Quality and Safety in Healthcare	3.0
	Term Credits	6.0
Term 6		
RSCH 504	Evaluation and Translation of Health Research	3.0
NURS 531	Epidemiology in Action: Tracking Health & Disease	3.0
	Term Credits	6.0
Term 7		
NURS 564	The Business of Healthcare	3.0
NURS 532	Evaluation of Health Outcomes	3.0
	Term Credits	6.0
Term 8		
NURS 550	Advanced Health Assessment & Diagnostic Reasoning	4.0
	Term Credits	4.0

Third Year

Term 9		
NURS 602	Foundations for Clinical Nurse Leader	4.0
	Term Credits	4.0
Term 10		
NURS 603	Clinical Nurse Leader Capstone Immersion I	5.0
	Term Credits	5.0
Term 11		
NURS 604	Clinical Nurse Leader Capstone Immersion II	5.0

TGFE 099 Portfolio Assessment	15.0
Term Credits	20.0

Total Credit: 78.0

Nursing Faculty

Suzan Blacher, PhD, RN, CARN *(Drexel University) RN-BSN Program*. Assistant Clinical Professor. Care of the patient with substance use disorders; stigmatization of addictions.

Beth Chiatti, PhD, RN, CTN, CSN *(Widener University)*. Assistant Clinical Professor. Genetics, transcultural nursing, immigrant health, human rights and global health

Danielle Devine, PhD, RN *(Villanova University)*. Assistant Clinical Professor. Neurology, Critical Care.

Gloria Donnelly, PhD *(Bryn Mawr College) Dean Emerita*. Professor. Nursing education and a variety of mental health topics including assertiveness, stress and change.

Katie Duncan, MSN, AGPCNP-BC *(University of Pennsylvania)*. Assistant Clinical Professor. Adult-gerontology primary care nurse practitioner.

Theresa Fay-Hillier, DrPH, MSN, PMHCNS-BC *(Drexel University)*. Assistant Clinical Professor. Child, adolescent and family mental health nursing.

Maryann Godshall, PhD, RN, CCRN, CPN, CNE *(Duquesne University)*. Associate Clinical Professor. Pediatrics, critical care, nursing education, pediatric burn patients.

Karen Goldschmidt, PhD, RN *(Wilmington University) Department Chair, RN-BSN Completion Department* . Assistant Clinical Professor. Professional issues, nursing education, staff development, scholarly writing.

Maureen Gonzales, MSN, WHNP *(University of Pennsylvania)*. Assistant Clinical Professor. Women's health, high risk obstetrics.

Cynthia Hambach, MSN, RN, CCRN *(Widener University)*. Assistant Clinical Professor. Critical care nursing.

Dana C. Kemery, EdD, MSN, RN, CNE, CEN, CPEN *(Drexel Universiy)*. Assistant Clinical Professor. Emergency nursing (adult and pediatric), nursing education.

Kayann Laughlin, MAHEd, MSN, RN *(Arcadia University)*. Assistant Clinical Professor. Community/public health, administration.

MaryKay Maley, DNP, APN, FNP, RN-BC *(University of Miami)*. Assistant Clinical Professor. Family health, faith community nursing, health promotion/disease prevention and mindfulness-based stress reduction.

Tasha Martin-Peters, MSN, RN *(Duke University)*. Assistant Clinical Professor. Pediatric critical care, pediatric cardiac care.

Pamela McGee, MSN, FNP-BC, CNE *(University of Pennsylvania)*. Assistant Clinical Professor. Medical/surgical nursing, gerontology, primary care, family nurse practitioner.

Kristen McLaughlin, PhD (candidate), MSN, RN, CPNP-PC *(Widener University)*. Assistant Clinical Professor. Pediatric nurse practitioner.

Nancy Murphy, PhD, RN, CNE *(University of Massachusetts Dartmouth).* Assistant Clinical Professor. Maternal child health, psychiatric/mental health; community, home and public health care.

Maura Nitka, MSN, RN, CPN *(Drexel University).* Assistant Clinical Professor. Pediatric nursing.

Carol Okupniak, DNP, RN-BC *(Chatham University).* Assistant Clinical Professor. Nursing informatics, simulation and women's health.

Jennifer Olszewski, EdD, MSN, CRNP, ANP-BC *(Drexel University) Interim Chair of the BSN Nursing Accelerated Career Entry Program.* Assistant Clinical Professor. Adult-gerontology nurse practitioner, dementia care.

Alis Kotler Panzera, DrNP, WHNP-BC, RN *(Drexel University) Director of Nursing Student Success.* Assistant Clinical Professor. Board certified women's health nurse practitioner, reproductive health and female urology.

Penny Parker, MSN, FNP-C, CCTC, CIC *(Drexel University).* Assistant Clinical Professor. Advanced heart failure and heart/lung transplantation; critical care nursing.

Genevieve Porrecca, MSN, RN, PCCN *(Holy Family University).* Assistant Clinical Professor. Critical care

Catherine Quay, MSN, RN-BC *(Pace University).* Assistant Clinical Professor. Board certified gerontology, medical/surgical nursing, dementia.

Leland Rockstraw, PhD, RN *(Drexel University).* Clinical Professor. Graduate Nursing-Advanced Roles. Adult orthopedic/surgical, emergency care, critical care, and trauma/surgery intensive care and healthcare simulation.

Al Rundio, PhD, DNP, RN, APRN, CARN-AP, NEA-BC, FNAP, FIAAN, FAAN *(Chatham College).* Clinical Professor. Transference of dependencies from bariatric surgical procedures, relapse prevention in chemically addicted clients.

Deanna Lynn Schaffer, PhD RN, ACNS-BC *(Widener University).* Assistant Clinical Professor. Recruitment and retention in higher education, nursing leadership, nursing practice environment, and nursing informatics.

Meaghan Shattuck, MSN, RN, OCN *(Holy Family University).* Assistant Clinical Professor. Oncology certified, medical/surgical nursing and education.

Helen Teng, PhD, RN *(University of Pennsylvania).* Assistant Clinical Professor. Community health, immigrant health.

Ann Thiel-Barrett, DNP, RN, FNP-BC, CNE *(Chatham University).* Assistant Clinical Professor. Family health nursing.

Denise Way, DNP, MSN, RN *(Wilmington University).* Assistant Clinical Professor. Osteoporosis prevention throughout the lifespan.

Joyce Welliver, MSN, CRNP, CAC, RN *(Drexel University) Director of Faculty Role Development and Clinical Performance.* Assistant Clinical Professor. Psychiatric/mental health nursing, adult health

Mary Yost, PhD, RN *(Widener Unirsity) Interim Chair of the BSN Co-Op Program.* Assistant Clinical Professor. Trauma/Critical Car and Emergency Nursing.

Mary Ann Zimmer, RN, MSN, CPN *(Villanova University).* Assistant Clinical Professor. Pediatrics, adult medical-surgical nursing, nursing education.

Accelerated Dual Degree in Nutrition Sciences BS/MS

Major: Nutrition and Food Science (BS) and Human Nutrition (MS)
Degree Awarded: Bachelor of Science (BS) and Master of Science (MS)
Calendar Type: Quarter
Total Credit Hours: 229.5
Co-op Options: One Co-op (Five years)
Classification of Instructional Programs (CIP) code: 51.3101
Standard Occupational Classification (SOC) code: 29-1031

About the Program

The Accelerated Dual-Degree in Nutrition Sciences is an academic track that enables students to complete both a bachelor's degree and master's degree in five years, in preparation for becoming a Registered Dietitian/Registered Dietitian Nutritionist (RD/RDN). Students pursue the Bachelor's degree in Nutrition and Food Science during their first four years of study and the Master's degree in Human Nutrition during the final year of study. Students are eligible for the program at the end of their second year of study if they have achieved a grade of B or better in all required courses. The Bachelor of Science in Nutrition and Food Science is awarded following completion of year four (first year of graduate study), and the Master of Science in Human Nutrition is awarded following year five. Upon completion of the master's degree, students will receive the Didactic Program in Dietetics (DPD) Verification Statement, allowing them to enroll in an accredited dietetic internship.

Additional Information

For more information about Nutrition Sciences, visit the College of Nursing and Health Professions' Nutrition Sciences Department (http://drexel.edu/cnhp/academics/departments/Nutrition-Sciences/).

Admission Requirements

The Accelerated Dual-Degree in Nutrition Sciences is available to high-achieving students in the BS Nutrition and Foods program who plan to become Registered Dietitians/Registered Dietitian Nutritionists. Current students may apply for admission to the program after they have completed the first two years of the undergraduate degree program. Transfer students may apply if they have fulfilled comparable coursework at another accredited college or university and meet all other admission criteria. Applicants must have earned a grade of B or better in all required courses in the first two years of the program. Applicants must also submit a personal statement outlining their goals and interest, and two letters of recommendation from faculty.

Degree Requirements

ANAT 101	Anatomy & Physiology I	5.0
ANAT 102	Anatomy & Physiology II	5.0
ANAT 103	Anatomy & Physiology III	5.0
BIO 122	Cells and Genetics	4.5
CHEM 101	General Chemistry I	3.5

CHEM 102	General Chemistry II	4.5
CHEM 103	General Chemistry III	5.0
CIVC 101	Introduction to Civic Engagement	1.0
CS 161	Introduction to Computing	3.0
COM 230	Techniques of Speaking	3.0
COM 310 [WI]	Technical Communication	3.0
or COM 345	Intercultural Communication	
CULA 115	Culinary Fundamentals	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
FDSC 154	Science of Food and Cooking	4.0
FDSC 270	Microbial Food Safety and Sanitation	4.0
FDSC 350	Experimental Foods: Product Development	3.0
FDSC 506	Food Composition & Behavior	3.0
HRM 215	Commercial Food Production	4.0
HRM 455	Hospitality Human Resources Management	3.0
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
NFS 203	Nutrition II: Nutrition in the Lifecycle	4.0
NFS 215	Nutritional Chemistry	3.0
NFS 217	Nutrient Quality & Composition	1.0
NFS 230	Intermediate Nutrition	4.0
NFS 265	Professional Issues in Nutrition and Foods	3.0
NFS 345	Foods and Nutrition of World Cultures	3.0
NFS 415	Advanced Nutrition I: Macronutrition	4.0
NFS 416	Advanced Nutrition II: Micronutrients	4.0
NFS 450	Advanced Nutritional Chemistry I	3.0
NFS 451	Advanced Nutritional Chemistry II	3.0
NFS 494	Senior Project I	2.0
NFS 495	Senior Project II	2.0
NFS 496	Senior Project III	2.0
NFS 510	Profession of Dietetics	3.0
NFS 525	Nutritional Assessment Through the Life Cycle	3.0
NFS 526	Lifecycle Nutrition	3.0
NFS 530	Macronutrient Metabolism	3.0
NFS 531	Micronutrient Metabolism	3.0
NFS 543	Medical Nutrition Therapy I	3.0
NFS 544	Medical Nutrition Therapy II	3.0
NFS 545	Nutrition in Critical Care	3.0
NFS 546	World Nutrition	3.0
NFS 550	Foodservice Systems Management	3.0
NFS 601	Research Methods	3.0
NFS 630	Nutrition Counseling	3.0
NFS 690	Community Nutrition	3.0
NFS 997	Research	9.0
ORGB 300 [WI]	Organizational Behavior	4.0
PSY 101	General Psychology I	3.0
SOC 101	Introduction to Sociology	3.0
or ANTH 101	Introduction to Cultural Diversity	
STS 345	Statistics for the Health Sciences	4.0
UNIV NH101	The Drexel Experience	1.0
Free electives		27.0
Graduate electives		15.0
Total Credits		229.5

Sample Plan of Study

Term 1		Credits
CHEM 101	General Chemistry I	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
PSY 101	General Psychology I	3.0
UNIV NH101	The Drexel Experience	1.0
	Term Credits	13.5
Term 2		
CHEM 102	General Chemistry II	4.5
CS 161	Introduction to Computing	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 101	Introduction to Analysis I	4.0
	Term Credits	14.5
Term 3		
CHEM 103	General Chemistry III	5.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
FDSC 154	Science of Food and Cooking	4.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	17.0
Term 4		
ANAT 101	Anatomy & Physiology I	5.0
BIO 122	Cells and Genetics	4.5
NFS 230	Intermediate Nutrition	4.0
Free elective		3.0
	Term Credits	16.5
Term 5		
ANAT 102	Anatomy & Physiology II	5.0
CULA 115	Culinary Fundamentals	3.0
FDSC 270	Microbial Food Safety and Sanitation	4.0
NFS 215	Nutritional Chemistry	3.0
NFS 217	Nutrient Quality & Composition	1.0
	Term Credits	16.0
Term 6		
ANAT 103	Anatomy & Physiology III	5.0
COM 345[*]	Intercultural Communication	3.0
NFS 203	Nutrition II: Nutrition in the Lifecycle	4.0
NFS 265	Professional Issues in Nutrition and Foods	3.0
	Term Credits	15.0
Term 7		
SOC 101 or ANTH 101	Introduction to Sociology Introduction to Cultural Diversity	3.0
COM 230	Techniques of Speaking	3.0
STS 345	Statistics for the Health Sciences	4.0
Free electives		6.0
	Term Credits	16.0
Term 8		
FDSC 350	Experimental Foods: Product Development	3.0
HRM 215	Commercial Food Production	4.0
NFS 415	Advanced Nutrition I: Macronutrition	4.0
NFS 450	Advanced Nutritional Chemistry I	3.0
Free elective		3.0
	Term Credits	17.0
Term 9		
COM 310 [WI][*]	Technical Communication	3.0

NFS 416	Advanced Nutrition II: Micronutrients	4.0
NFS 451	Advanced Nutritional Chemistry II	3.0
ORGB 300 [WI]	Organizational Behavior	4.0
Free elective		3.0
	Term Credits	17.0
Term 10		
FDSC 506	Food Composition & Behavior	3.0
NFS 494	Senior Project I	2.0
NFS 510	Profession of Dietetics	3.0
NFS 531	Micronutrient Metabolism	3.0
Free electives		6.0
	Term Credits	17.0
Term 11		
NFS 495	Senior Project II	2.0
NFS 525	Nutritional Assessment Through the Life Cycle	3.0
NFS 530	Macronutrient Metabolism	3.0
Free electives		6.0
Graduate-level elective		3.0
	Term Credits	17.0
Term 12		
HRM 455	Hospitality Human Resources Management	3.0
NFS 345	Foods and Nutrition of World Cultures	0.0-3.0
NFS 496	Senior Project III	2.0
NFS 526	Lifecycle Nutrition	3.0
NFS 601	Research Methods	3.0
	Term Credits	11.0-14.0
Term 13		
NFS 543	Medical Nutrition Therapy I	3.0
NFS 630	Nutrition Counseling	0.0-3.0
NFS 997	Research	3.0
Graduate-level elective		3.0
	Term Credits	9.0-12.0
Term 14		
NFS 544	Medical Nutrition Therapy II	3.0
NFS 690	Community Nutrition	3.0
NFS 997	Research	3.0
Graduate-level elective		6.0
	Term Credits	15.0
Term 15		
NFS 545	Nutrition in Critical Care	3.0
NFS 546	World Nutrition	3.0
NFS 550	Foodservice Systems Management	3.0
NFS 997	Research	3.0
	Term Credits	12.0

Total Credit: 223.5-229.5

*   May substitute with free elective.

Nutrition Sciences Faculty

Joan Rosen Bloch, PhD, CRNP *(University of Pennsylvania)*. Associate Professor. Maternal and infant health outcomes with a particular focus on racial and ethnic perinatal health disparities.

Charlene Compher, PhD, RD, CNSC, LDN, FADA, FASPEN *(Drexel University) Courtesy Appointment*. Visiting Research Professor.

Robin M. Danowski, MS, RD, LDN. Instructor. Renal Nutrition

Nyree Dardarian, MS, RD, LDN, CSSD, FAND *(Drexel University) Director, Center for Nutrition & Performance*. Clinical Assistant Professor. Energy expenditure; sports nutrition

Franceso De Luca, MD *(Catholic University of Sacred Heart, Rome, Italy) Courtesy Appointment*. Visiting Research Professor.

Angelo Del Parigi, MD *(University of Bari, Italy) Courtesy Appointment*. Visiting Research Professor.

Jonathan Deutsch, PhD *(New York University)*. Professor. Social and cultural aspects of food, culinary education, culinary improvisation, recipe and product development; food sustainability.

RoseAnn DiMaria-Ghalili, PhD, MSN, BSN, CNSC *(New York University, School of Education, Division of Nursing)*. Associate Professor. Nutrition and surgical recovery to improve the care of older adults undergoing surgery; nutrition assessment, inflammation, and health outcomes.

Garrison L. Draper, MSc, CSCS, USAW, ISPAS *(Edith Cowan University, Perth, WA) Courtesy Appointment*. Visiting instructor

Susan Ettinger, PhD, RD, DABN, CDN *(Columbia University) Courtesy Appointment*. Visiting Research Professor.

Debi Page Ferrarello, RN, MSN, MS, IBCLC, RLC *(Jefferson University, Arcadia University)*. Instructor. Human lactation

Andrea Judge, MPH, IBCLC, RLC *(University of North Carolina)*. Clinical Instructor. Human lactation

Joseph Kehayias, PhD *(Indiana University)*. Professor. Body composition analyses; measurement of sarcopenia; osteoporosis; energy expenditure.

Tanya V.E. Kral, PhD *(Pennsylvania State University) Courtesy Appointment*. Visiting Research Professor.

Beth L. Leonberg, MS, MA, RDN, CSP, FAND, LDN *(Colorado State University, Rowan University) Director, Didactic Program in Dietetics* . Associate Clinical Professor. Pediatric nutrition.

Rachelle Lessen, MS, RD, IBCLC, LDN *(Arcadia University)*. Instructor. Human lactation

Michael Lowe, PhD *(Boston College)*. Professor. Prevention and treatment of eating disorders and obesity; effects of appetitive responsiveness and dietary restraint on eating regulation; psychobiology of obesity-proneness; empirical foundations of unconscious processes.

Brandy-Joe Milliron, PhD *(Arizona State University)*. Associate Professor. The development and evaluation of modifications in the natural environment to promote healthier living; farm to table school initiatives

Juan Muniz, PhD *(Oregon State University)*. Visiting Research Professor. Food microbiology; community-based research to assess pesticide levels in homes; prevention of health effects of pesticides for indigenous farmworkers.

Jennifer Nasser, PhD, RD, FTOS *(Rutgers University)*. Associate Professor. Dopamine-mediated mechanisms of food intake regulation in humans and its impact on metabolic homeostasis, especially as it applies to obesity, eating disorders and aging.

Margaret O'Neil, PT, PhD, MPH *(MCP Hahnemann University; Duke University; University of North Carolina at Chapel Hill)*. Adjunct Associate Professor. Measurement of and interventions to improve physical activity and fitness levels and promote participation in children and youth with who are overweight/obese and those with physical disabilities (especially cerebral palsy).

Irene E. Olsen, PhD, RD, LDN *(Tufts University) Courtesy Appointment.* Visiting Research Professor.

Kavitha Penugonda, PhD *(Kansas State University) Manager, Nutritional Biochemistry Laboratory.* Assistant Clinical Professor. Nutrient bioavailability in foods; nutritional supplements on health

Jennifer Quinlan, PhD *(North Carolina State University).* Professor. Food microbiology; microbiological quality and safety of produce, dairy and meat products in markets in high vs. low socioeconomics areas, Bacillus and Clostridium spores in food processing.

Sobhana Ranjan, PhD, RD *(University of Delhi, India) Courtesy Appointment.* Visiting Research Professor.

Barry Ritz, PhD *(Drexel University) Courtesy Appointment.* Visiting Research Professor.

Patricia A. Shewokis, PhD *(University of Georgia).* Professor. Roles of cognition and motor function during motor skill learning; role of information feedback frequency on the memory of motor skills, noninvasive neural imaging techniques of functional near infrared spectroscopy(fNIRS) and electroencephalograpy (EEG) and methodology and research design.

Sinclair A. Smith, MS, DSc *(Boston University) Chair, Health Sciences.* Professor. Effects of aging, dehydration, and oral creatine supplementation on skeletal muscle metabolism using phosphorus magnetic resonance spectroscopy. Anatomy, physiology, and exercise science.

Deeptha Sukumar, PhD *(Rutgers University).* Associate Professor. Vitamin D and magnesium and bone mineral density; obesity and bone mineral density.

Alison Ventura, PhD *(Pennsylvania State University) Courtesy Appointment.* Visiting Research Professor. Factors that contribute to the development of eating behaviors and dietary preferences during infancy and early childhood.

Stella Lucia Volpe, PhD, RD, ACSM-CEP, FACSM *(Virginia Polytechnic Institute and State University) Chair, Nutrition Sciences.* Professor. Prevention of obesity and diabetes across the lifespan; mineral metabolism and exercise; energy balance; sports nutrition.

Emeritus Faculty

Donna H. Mueller, PhD *(Temple University).* Associate Professor Emeritus. Clinical nutrition; pediatric nutrition; nutrition in pulmonary diseases, especially cystic fibrosis; nutrition in developmental delay; dental nutrition; dietetic education and professional development.

Minor in Addictions Counseling

About the Minor

The minor in addictions counseling provides students with an understanding of current best-practice approaches in counseling interventions aimed at assisting people in recovery from substance use disorders. This minor appeals to students in a wide range of Drexel majors, including psychology, criminal justice, health services administration, sociology, health sciences, education, general humanities and social science, nutrition and foods, as well as other fields of study.

Academic Requirements

The minor includes six required courses and two additional BACS undergraduate courses of the student's choosing. Students may elect to begin coursework in this minor at any point in their undergraduate education. It is strongly suggested that students pursuing this minor consult with faculty in the Department of Counseling and Family Therapy (http://drexel.edu/cnhp/faculty/counseling-and-family-therapy/) program for advice in selecting electives that will best meet their goals in this minor.

Required Courses

BACS 220	Counseling Theory and Practice	3.0
BACS 234	Introduction to Addictive Disorders	3.0
BACS 301	Group Counseling I	3.0
BACS 304	Cognitive and Behavioral Counseling I	3.0
BACS 310	Recovery and Relapse Prevention	3.0
BACS 367	Advanced Counseling Intervention	3.0
Select any two additional undergraduate BACS courses		6.0
Total Credits		24.0

Minor in Culinary Arts

About the Minor

The minor in culinary arts is designed for students pursuing a variety of majors who also have an interest in food and cuisine. The required courses introduce the major cuisines, and develop necessary culinary technical skills and fundamental knowledge of foods and food preparation. Students are able to select elective courses in various cuisines or can explore more theoretical areas of the field through topics including gastronomy, food history, and food writing.

Required Courses

CULA 115	Culinary Fundamentals	3.0
or CULA 120	Techniques and Traditions I	
CULA 305	Fundamentals of Italian Cuisine	3.0
CULA 310	Fundamentals of French Cuisine	3.0
CULA 315	Fundamentals of American Cuisine	3.0
HRM 215	Commercial Food Production	4.0
Select three of the following:		8.0
CULA 121	Techniques and Traditions II	
CULA 125	Foundations of Professional Baking	
CULA 216	A la Carte	
CULA 220	Patisserie I	
CULA 225	Patisserie II	
CULA 226	Patisserie III	
CULA 240	Fundamentals of Chinese Cuisine	
CULA 306	Advanced Italian Cuisine	
CULA 311	Advanced French Technique	
CULA 320	Advanced Culinary Studio	
CULA 325	Garde Manger Laboratory	
CULA 316	Butchery Laboratory	
CULA 330	Charcuterie	
CULA 335	Fundamentals of Indian Cuisine	
CULA 400	Directed Studies with a Master Chef	
CULA 405 [WI]	Culture and Gastronomy I	
CULA 410	Culture and Gastronomy II	
CULA 415	Food Styling and Photography	
CULA 425	The Kitchen Garden	
CULA 426	The Kitchen Garden: Summer	
CULA 427	The Kitchen Garden: Fall	
HRM 315	Continental, Ethnic, and Regional Cuisine	

HRM 415	Fine Dining and Services	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Exercise Science

About the Minor

The Minor in Exercise Science from the Health Sciences Department helps prepare students for graduate studies in Exercise Physiology, Kinesiology, Athletic Training, Physical Therapy and other health-related professions. In addition, the Minor provides undergraduates with the foundational knowledge, skills, and abilities for professional certifications offered by the American College of Sports Medicine, National Strength and Conditioning Association, and other agencies. These certifications are often required of graduates seeking employment in the fitness industry.

This is an undergraduate Minor available to Drexel students in good standing.

Foundational Courses

ANAT 103	Anatomy & Physiology III	5.0
	OR	
BIO 201 & BIO 202	Human Physiology I and Human Physiology Laboratory *	

Core Courses

HSCI 325	Exercise Physiology	4.0
HSCI 326	Applied Anatomy and Kinesiology	5.0
HSCI 425	Exercise Testing and Prescription	4.0

Electives

Select from the following		6.0
HSCI 410	Psychology of Physical Activity	
HSCI 415	Musculoskeletal Pathophysiology	
HSCI 490	Senior Research Project	
HSCI T480	Special Topics in Health Sciences	
NFS 100	Nutrition, Foods, and Health	
NFS 101	Introduction to Nutrition & Food	
NFS 325	Nutrition & Exercise Physiology	
Total Credits		24.0

*   If BIO 201 & BIO 202 combination, the total Foundational Course credits will be 6.0.

Minor in Food Science

About the Minor

The minor in food science is designed for students interested in applying the basic sciences to the world's largest industry. The minor should be especially attractive to students in chemistry, chemical engineering, nutrition, and biological sciences, as it provides a background for excellent employment and post-baccalaureate study opportunities in areas closely allied to their basic disciplines.

The minor consists of 25.0 credits. Interested students should consult with a culinary science faculty member to schedule courses appropriate for their background and goals.

Program Requirements

Required Courses

FDSC 154	Science of Food and Cooking	4.0
FDSC 270	Microbial Food Safety and Sanitation	4.0
FDSC 350	Experimental Foods: Product Development	3.0
FDSC 450	Food Microbiology	3.0
FDSC 451	Food Microbiology Laboratory	2.0
FDSC 456	Food Preservation Processes	3.0
FDSC 460	Food Chemistry	3.0
FDSC 461	Food Analysis	3.0
Total Credits		25.0

Minor in Food Studies

About the Minor

Food is central to our existence and is touched upon in a variety of disciplines at the university. This minor seeks to capture and help students navigate the breadth of course offerings that touch upon food systems. Because food systems can be studied through many different lenses, students can adapt this food studies minor to their program of study. For example, students interested in public health policy issues can create a minor of hands-on community-based culinary classes, public health, and nutrition classes. If a student is interested in food-related research and development, he or she might tailor the minor with business- or entrepreneurship-centered classes and practical experience in the Drexel Food Lab.

Program Requirements

Required Courses

CULA 115	Culinary Fundamentals	3.0
CULA 405 [WI]	Culture and Gastronomy I	3.0
FDSC 120	Food and the Senses	3.0

Food Studies Electives

Select a minimum of 15.0 credits from the list below:		15.0
CULA 125	Foundations of Professional Baking	
CULA 410	Culture and Gastronomy II	
CULA 412	Food Writing	
ENTP 250	Ideation	
ENTP 270	Social Entrepreneurship	
ENTP 440	Launch It!: Early Stage	
HRM 160	Laws of the Hospitality Industry	
HRM 315	Continental, Ethnic, and Regional Cuisine	

HRM 395	Economics of Tourism	
NFS 100 & NFS 101	Nutrition, Foods, and Health and Introduction to Nutrition & Food	
NFS 215	Nutritional Chemistry	
NFS 217	Nutrient Quality & Composition	
NFS 230	Intermediate Nutrition	
NFS 345	Foods and Nutrition of World Cultures	
NFS 391	Community Nutrition	
PBHL 101	Public Health 101	
PBHL 306	Introduction to Community Health	
PSCI 369	The Politics of Food	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Health Services Administration

About the Minor

The minor in health services administration is designed for students interested in preparing for careers in health services administration while pursing a major in another area. In addition, the curriculum can prepare students wishing to pursue graduate studies in health administration, business administration, public health, and law.

Required Courses

HSAD 210	Health-Care Ethics I	3.0
HSAD 310	Introduction to Health-Systems Administration	3.0
HSAD 334	Management of Health Services	3.0
Complete 1 of the following courses:		**3.0**
HSAD 330	Financial Management in Health Care	
HSAD 340	Leadership in Health Services Administration	
HSAD 345	Ethics in Health Care Management	
Health Services Administration (HSAD) electives *		
Complete 4 of the following courses:		12.0
HSAD 215	Physician Practice Management	
HSAD 308	The Affordable Care Act	
HSAD 309	Advanced Health-Care Ethics	
HSAD 312	Development of World Health Care	

HSAD 313	Evolution of Health Care in the United States	
HSAD 315	Interdisciplinary Health Services	
HSAD 316	Health Care across Cultures	
HSAD 317	Religious Views on Health Care	
HSAD 318	Health and Vulnerable Populations	
HSAD 319	Women and the Health Professions	
HSAD 320	Managed Health Care	
HSAD 321	Health-Care Human Resources	
HSAD 322	Health-Care Law	
HSAD 323	Introduction to Long-Term Care Administration	
HSAD 324	Health Technology and Ethical Responsibility	
HSAD 325	Issues in the Health Care System	
HSAD 326	Holism and Health Care	
HSAD 327	Partnerships in Health Care	
HSAD 328	Health Care for Diverse Groups	
HSAD 329	Health Care and the Media	
HSAD 330	Financial Management in Health Care	
HSAD 331 [WI]	Non-profits and Health Care	
HSAD 332 [WI]	Health-Care Marketing	
HSAD 336	Urban Health Care	
HSAD 337	Health Care/Quality Improvement	
HSAD 340	Leadership in Health Services Administration	
HSAD 341	Risk Management in Healthcare Organizations	
HSAD 342	Children and Health Care	
HSAD 343	Health and Illness in Film	
HSAD 345	Ethics in Health Care Management	
HSAD 346	Mental Illness in the Media and Arts	
HSAD 351	Ethical Issues in Reproduction	
HSAD 353	Public Health Ethics	
HSAD 475	The Supervised Health Services Administration Internship	
HSAD T180	Special Topics in Health Services Administration	
HSAD T280	Special Topics in Health Services Administration	
HSAD T380	Special Topics in Health Services Administration	
HSAD T480	Special Topics in Health Services Administration	
Total Credits		24.0

Minor in Nutrition

About the Minor

The minor in the nutrition is designed for students interested in enhancing their major with an application in human nutrition. The nutrition minor should be especially attractive to students in the premedical, biological, and behavioral neurological sciences, because it provides a background for enhanced employment and post-baccalaureate study opportunities in areas closely allied to their basic disciplines.

The minor consists of 25.0 credits. Interested students should consult with a faculty member within the Department of Nutrition Sciences to schedule courses appropriate for their background and goals.

Program Requirements

Required courses

NFS 200	Nutrition I: Principles of Nutrition	4.0
or NFS 230	Intermediate Nutrition	
NFS 203	Nutrition II: Nutrition in the Lifecycle	4.0
NFS 315	Nutrition in Chronic Disease	4.0
Select four of the following courses:		12.0-14.0
NFS 320	Pediatric Nutrition	
NFS 325	Nutrition & Exercise Physiology	

NFS 415	Advanced Nutrition I: Macronutrition	
NFS 416	Advanced Nutrition II: Micronutrients	
NFS 446	Perspectives in World Nutrition	
NFS 480	Special Studies in Nutrition and Food	
Total Credits		24.0-26.0

Minor in Psychiatric Rehabilitation

About the Minor

The minor in Psychiatric Rehabilitation provides students with an understanding of how people with serious mental illnesses learn skills and acquire resources that promote recovery and wellness. The curriculum covers a variety of evidence-based practices that support healthy living, learning, working, and socializing. This minor appeals to students in a wide range of Drexel majors, including psychology, criminology and justice studies, health services administration, sociology, health sciences, education, general humanities and social science, nutrition and foods, as well as other fields of study.

Academic Requirements

The minor requires completion of 24.0 credits, comprised of six required courses and two additional BACS undergraduate courses of the student's choosing. Students may elect to begin coursework in this minor at any point in their undergraduate education. It is strongly suggested that students pursuing this minor consult with faculty in the Behavioral Health Counseling (http://www.drexel.edu/cnhp/faculty/behavioral-health/) program for advice in selecting electives that will best meet their goals in this minor.

Required Courses

BACS 220	Counseling Theory and Practice	3.0
BACS 236 [WI]	Psychiatric Rehabilitation Principles and Practices	3.0
BACS 320	Crisis and Brief Intervention	3.0
BACS 325	Psychopharmacology for Counselors	3.0
BACS 414	Co-Occurring Disorders	3.0
BACS 420	Psychiatric Rehabilitation Competencies	3.0
Select any two additional undergraduate BACS Courses		6.0
Total Credits		24.0

Human Lactation

Certificate Level: Undergraduate
Admission Requirements: High School Diploma
Certificate Type: Certificate
Number of Credits to Completion: 18.0
Instructional Delivery: Campus
Calendar Type: Quarter
Expected Time to Completion: 18 months
Financial Aid Eligibility: Aid eligible
Classification of Instructional Program (CIP) Code: 51.0815
Standard Occupational Classification (SOC) Code: 31-9099

About the Program

Housed in the Department of Nutrition Sciences at Drexel University, the Human Lactation Certificate Program is designed to provide an opportunity for individuals interested in becoming Internationally Board Certified Lactation Consultants (IBCLCs) to obtain the required 90 hours of didactic coursework and 300 hours of supervised practice to meet eligibility through the International Board Certified Lactation Examiner's Pathway 2. The courses are designed for current Drexel students, practicing health care and public health professionals outside of Drexel, and others interested in entering the health professions. There is currently a strong global and national emphasis on increasing breastfeeding to promote health at the population level, prevent acute and chronic illness and decrease societal health care costs. The United States Surgeon General, the Centers for Disease Control and Prevention, Healthy People 2020, the Institute of Medicine, the Joint Commission, and many professional associations include breastfeeding as a key health strategy.

The certificate program consists of six, 3.0 credit courses in lactation; the first three courses are didactic, and the remaining three courses are supervised practice. The didactic coursework is offered in the classroom and online setting. The supervised practice is offered at area hospitals and outpatient clinics with whom the College of Nursing and Health Professions, Department of Nutrition Sciences is affiliated, as well as a variety of community-based lactation education/support programs.

Students who wish to become IBCLCs must complete all six courses. To be eligible to take the certifying exam given by the International Board of Lactation Consultant Examiners they must have also completed course work including anatomy and physiology, biology, child growth and development, nutrition, and psychology, which may be taken at Drexel or other institutions.

Admission Requirements

Applicants must have a minimum of a high school diploma. The International Board of Lactation Consultant Examiners requires education in 14 health science subjects in addition to education provided in human lactation and breastfeeding in the Certificate Program. At least four of the first eight health sciences courses listed below *must* be completed prior to enrolling in the Certificate Program; all of the remaining health sciences courses *must* be completed before enrolling in first supervised practice course.

A minimum of one quarter, term or semester of each of the following eight academic subjects must be completed at an accredited college or university:

- Biology
- Human Anatomy
- Human Physiology
- Infant and Child Growth and Development
- Introduction to Clinical Research
- Nutrition
- Psychology, OR Counseling Skills, OR Communication Skills
- Sociology, OR Cultural Sensitivity, OR Cultural Anthropology

The remaining six subjects may be completed at an accredited college or university, OR through continuing education courses:

- Basic Life Support*
- Medical Documentation
- Medical Terminology
- Occupational Safety and Security for Health Professionals*
- Professional Ethics for Health Professionals
- Universal Safety Precautions and Infection Control*

*These subjects will be covered during the Compliance process prior to beginning supervised practice, and *do not* need to be completed before enrolling in the program.

A detailed description of acceptable course work to fulfill these requirements is available in the International Board of Lactation Consultant's *Health Sciences Education Guide*.

Transcripts:

- Official transcripts demonstrating completion of health science requirements must be sent directly to Drexel from all the colleges/universities that you have attended. Transcripts must be submitted in a sealed envelope with the college/university seal over the flap or delivered electronically via secure delivery directly to the Program Director. Please note that transcripts are required regardless of number of credits taken or if the credits were transferred to another college/university. An admission decision may be delayed if you do not send transcripts from all colleges/universities attended.
- Transcripts must show course-by-course grades and degree conferrals. If your college/university issues only one transcript for life, you are required to have a course-by-course evaluation completed by an approved transcript evaluation agency.
- Please see the Drexel University Supporting Documents Submission Guide (http://online.drexel.edu/support/supporting-documents.aspx) for more information.

Requirements

NFS 205	Introduction to Human Lactation	3.0
NFS 305	Clinical Issues in Human Lactation	3.0
NFS 405	Public Policy of Breastfeeding	3.0
NFS 485	Lactation Supervised Practice (Taken 3 times)	9.0
Total Credits		18.0

A minimum grade of C is required for NFS 205, NFS 305, and NFS 405. NFS 485 is pass/fail.

Sample Plan of Study

First Year

Term 1		**Credits**
NFS 205	Introduction to Human Lactation	3.0
	Term Credits	3.0
Term 2		
NFS 305	Clinical Issues in Human Lactation	3.0
	Term Credits	3.0
Term 3		
NFS 405	Public Policy of Breastfeeding	3.0
	Term Credits	3.0

Second Year

Term 4		
NFS 485	Lactation Supervised Practice	3.0
	Term Credits	3.0
Term 5		
NFS 485	Lactation Supervised Practice	3.0
	Term Credits	3.0
Term 6		

NFS 485	Lactation Supervised Practice	3.0
	Term Credits	3.0

Total Credit: 18.0

Certificate in Medical Billing and Coding

Certificate Level: Undergraduate
Admission Requirements: High school transcript minimum
Certificate Type: Certificate
Number of Credits to Completion: 30.0
Instructional Delivery: Online
Calendar Type: Quarter
Expected Time to Completion: 1 year
Financial Aid Eligibility: Not aid eligible
Classification of Instructional Program (CIP) Code: 51.0713
Standard Occupational Classification (SOC) Code: 29-2071

About the Program

This online certificate program is designed for those who want to begin medical billing, coding, and medical record auditing careers or prepare for certification exams in these areas. Students will learn principles of medical billing and coding related to the three main coding manuals: CPT, ICD-10-CM, ICD-10-PCS and HCPCS. The curriculum covers principles of medical billing and coding for in-patient and outpatient hospitals.

Program Requirements

Required Courses

ANAT 202	Sectional Anatomy	3.0
HSCI 125	Medical Terminology	3.0
DMBC 201	Medical Billing I	3.0
DMBC 202	Medical Billing II	3.0
DMBC 250	Medical Billing Software	3.0
DMBC 301	Physician-Based Medical Coding I	3.0
DMBC 302	Physician-Based Medical Coding II	3.0
DMBC 303	Hospital-Based Medical Coding I	3.0
DMBC 304	Hospital-Based Medical Coding II	3.0
Choose Either:		
DMBC 350	Physician-Based Chart Auditing	3.0
or DMBC 360	Hospital-Based Case Studies	
Total Credits		30.0

Sample Plan of Study

Term 1		**Credits**
ANAT 202	Sectional Anatomy	3.0
HSCI 125	Medical Terminology	3.0
	Term Credits	6.0
Term 2		
DMBC 201	Medical Billing I	3.0
DMBC 250	Medical Billing Software	3.0
	Term Credits	6.0
Term 3		
DMBC 202	Medical Billing II	3.0
DMBC 301	Physician-Based Medical Coding I	3.0
	Term Credits	6.0
Term 4		
DMBC 302	Physician-Based Medical Coding II	3.0
DMBC 303	Hospital-Based Medical Coding I	3.0
	Term Credits	6.0

Term 5

DMBC 304	Hospital-Based Medical Coding II	3.0
	Choose Either:	
DMBC 350	Physician-Based Chart Auditing	3.0
or 360	Hospital-Based Case Studies	
	Term Credits	6.0

Total Credit: 30.0

Additional Information

Contact:

Drexel University Online
Email: DUonline@drexel.com (DUonline@drexel.edu)

Phone: 877-215-0009

The Dornsife School of Public Health

About the School

The Dornsife School of Public Health (http://drexel.edu/dornsife/) at Drexel University provides education, conducts research, and partners with communities and organizations to improve the health of populations.

Founded on the principle of health as a human right, our school is especially committed to improving health in cities, eliminating health disparities, and promoting health in all policies.

Key to the school's mission is active engagement with the world of public health practice, with communities, and with a range of policies and sectors within and outside the health care system relevant to health.

School educational programs combine rigorous training with hands-on practical experiences. Students benefit from engagement with a broad set of community partnerships and research collaborations. Graduates acquire the knowledge, skills and perspective necessary to make a difference in the health of communities in the United States and worldwide.

Majors

- Public Health (BS) (p. 343)

Accelerated Degree

- Public Health BS/MPH (p. 346)

Minor

- Global Public Health (p. 348)
- Public Health (p. 349)

Dornsife School of Public Health Faculty

Joseph Amon, PhD, MSPH *(Uniformed Services University of the Health Sciences) Director of the Office of Global Health.* Clinical Professor. Department of Community Health and Prevention. Global health; health and human rights; political epidemiology; ethics; mixed methods; health policy and advocacy; HIV/TB; monitoring and evaluation.

Amy Auchincloss, PhD, MPH *(University of Michigan).* Associate Professor. Department of Epidemiology and Biostatistics. Environmental determinants of health and the health effects of air pollution; contribution of resources in residential environments to health behaviors, obesity, diabetes and cardiovascular disease; the use of spatial analysis methods and agent-based mode

Sharrelle Barber, ScD, MPH *(Harvard University).* Assistant Research Professor. Department of Epidemiology and Biostatistics. Racism and health inequities, social epidemiology cardiovascular disease epidemiology, urban health, global health.

Scarlett Bellamy, ScD *(Harvard University).* Professor. Department of Epidemiology and Biostatistics. Clinical Trials Data Analysis Methods Health Disparities Infectious Disease Mental health and Behavioral health Reproductive or Sexual Health.

Zekarias Berhane, PhD *(University of Pittsburgh).* Assistant Research Professor. Department of Epidemiology and Biostatistics. Modeling time-to-event data with single and multiple outcomes, mixed effect models and regression diagnostics.

Usama Bilal, PhD, MPH, MD *(Johns Hopkins University).* Assistant Professor. Department of Epidemiology and Biostatistics. Urban health; macrosocial determinants of chronic diseases; health inequalities; food environments and nutrition; epidemiologic methods.

Sandra Bloom, MD *(Temple University School of Medicine).* Associate Professor. Department of Health Management and Policy. Psychological trauma and organizational stress.

Sherry Brandt-Rauf, MPhil, JD *(Columbia University).* Associate Teaching Professor. Department of Environmental and Occupational Health. Health policy, occupational health, environmental exposures, health disparities, public health law.

Jennifer Breaux, DrPh, MPH, CHES *(Drexel University) Director of Undergraduate Education.* Assistant Professor. Department of Community Health and Prevention. Maternal and child health, community health, human rights.

Darryl Brown, PhD *(Johns Hopkins University) Director of HMP Doctoral Programs..* Assistant Teaching Professor. Department of Health Management and Policy. Health services research and planning; health inequality, patient reported outcomes, applied health economics.

James W. Buehler, MD *(University of California, San Francisco) Director, MPH Program.* Clinical Professor. Department of Health Management and Policy. Public health capacity and practice, public health and healthcare interface, urban health.

Igor Burstyn, PhD *(Utrecht University).* Associate Professor. Department of of Environmental and Occupational Health. Occupational and environmental epidemiology, industrial hygiene, endocrine disruptors, environmental exposures, biomarkers, air quality, gene-environmental interaction, maternal and child health, Bayesian statistics, statistical modeling, etiology of autism.

Amy Carroll-Scott, PhD, MPH *(University of California at Los Angeles).* Assistant Professor. Department of Community Health and Prevention. The social and contextual determinants of persistent health disparities and the application of social science and community-based participatory research methods to understanding and eliminating such disparities.

Esther Chernak, MD, MPH, FACP *(UMDNJ-Robert Wood Johnson Medical School) Director of the Center for Public Health Readiness and Communication; Director of Joint Degree Programs.* Associate Clinical Professor. Department of Environmental and Occupational Health. Drexel University College of Medicine; Infectious diseases, public health emergency preparedness, medicine and public health, public health practice, crisis and emergency risk communication.

Mariana Chilton, PhD, MPH *(University of Pennsylvania) Director, Center for Hunger-Free Communities.* Professor. Department of Health Management and Policy. Nutrition, housing and health; chronic diseases; human rights, chronic diseases, community health, human rights and hunger.

Jane Clougherty, MSc, ScD *(Harvard University).* Associate Professor. Department of Environmental and Occupational Health. Social

susceptibility to environmental pollutants; air pollution exposure science; community violence; urban health.

Anneclaire De Roos, PhD, MPH *(University of North Carolina at Chapel Hill)*. Associate Professor. Department of Environmental and Occupational Health. Environmental and occupational epidemiology, pesticides, persistent pollutants, drinking water quality, greenspace in cities, extreme weather risk assessment.

Ana Diez Roux, MD, PhD, MPH *(Johns Hopkins University) Dean, Dornsife School of Public Health.* Distinguished Professor. Department of Epidemiology and Biostatistics. Social determinants of health; neighborhoods and health; psychosocial factors; air pollution, cardiovascular disease epidemiology; multilevel and systems methods; urban health and health in Latin America.

Nancy Epstein, MPH, MAHL *(University of North Carolina at Chapel Hill)*. Professor. Department of Community Health and Prevention. Community organizing and community engagement strategies; arts and community health; religion, spirituality and health; health policy and advocacy; organizational and group dynamics; behavioral health; oral health; evaluation of community health programs.

Alison A. Evans, ScD *(Harvard University)*. Associate Professor. Department of Epidemiology and Biostatistics. Epidemiology of infectious diseases and cancer; cohort studies; minority and immigrant health; chronic viral infections; hepatitis b; eliminantion of viral hepatitis; immunization; perinatal transmission.

Alex Ezeh, PhD *(University of Pennsylvania)*. Dornsife Professor. Department of Community Health and Prevention. Global/International Health; Reproductive and Sexual Health; Urban Health.

Jerry Fagliano, MPH, PhD *(Johns Hopkins University) Chair.* Associate Clinical Professor. Department of Environmental and Occupational Health. Children's health and environmental exposures; health impacts of climate change; inequities in environmental exposure and disease; spatial distribution and clustering of disease.

Robert I. Field, PhD, JD, MPH *(Columbia University) Director of the JD-Master of Public Health Program.* . Professor. Department of Health Management and Policy. Health law; public health law; health system structure; ethics of vaccines; public policy and legal aspects of health reform; genetic privacy.

Janet Fleetwood, PhD *(University of Southern California)*. Professor. Department of Community Health and Prevention. Bioethics, Strategic Planning, Social Justice & Equity.

Arthur L. Frank, MD, PhD *(Mount Sinai School of Medicine) Chair Emeritus.* Professor. Department of Environmental and Occupational Health. Environmental and occupational health, agricultural safety and health, pneumoconiosis, occupational toxicology, environmental pollution.

Dennis Gallagher, MA, MPA *(University of Pittsburgh)*. Associate Teaching Professor. Department of Health Management and Policy. Health department structure and financing; health policy and law; Medicare/Medicaid and public health infrastructure.

Marla Gold, MD *(New Jersey Medical School) Dean Emerita.* Professor. Department of Health Management and Policy. Design of HIV/AIDS care systems, treatment protocols, resource utilization, and epidemiology; CQI, managed care and systems of health care, health administration, behavioral health care and substance abuse treatment systems.

Neil Goldstein, PhD, MBI *(Drexel University)*. Assistant Research Professor. Department of Epidemiology and Biostatistics. Data Analysis Methods, eHealth or mHealth, Infectious Disease, Maternal and Child Health, Reproductive or Sexual health, Spatial Analysis or GIS, Statistical Modeling, Vaccines and vaccinations, Electronic medical records/informatics, Translational epidemiology.

Edward J. Gracely, PhD *(Temple University) Joint Appointment in Drexel University College of Medicine.* Associate Professor. Department of Epidemiology and Biostatistics. Statistics, experimental design/research methods and statistical analysis, clinical trials.

Ali Groves, PhD, MHS *(University of North Carolina)*. Assistant Professor. Department of Community Health and Prevention. Reproductive or sexual health; maternal and child health; global health; data analysis methods.

Irene Headen, PhD *(University of California, Berkeley)*. Assistant Professor. Community Engaged Research, Health Disparities Health and Place, Maternal and Child Health Mixed Methods Research, Social Determinants of Racial/Ethnic Inequities in Maternal Health, Spatial Analysis or GIS,Urban Health

Tom Hipper, MSPH, MA *(Johns Hopkins Bloomberg School of Public Health)*. Assistant Professor. Department of Environmental and Occupational Health. Crisis and risk communication in public health; mental health of first responders

Jana Hirsch, MES, PhD *(University of Michigan)*. Assistant Research Professor. Department of Epidemiology and Biostatistics. Health and place, built environment, health disparities, behavioral health, spatial analysis, GIS, urban health, physical activity, active aging and age-friendly neighborhoods, gentrification, neighborhood change.

Mary E. Hovinga, PhD, MPH *(University of Michigan)*. Associate Professor. Department of Epidemiology and Biostatistics. Cancer, cognitive disabilities; PCBs and DDT, lead exposure; neurological disorders, environmental hazards, epidemiologic study design.

Tran Huynh, PhD, MPH, CIH *(University of Minnesota)*. Assistant Professor. Department of Environmental and Occupational Health. Industrial hygiene, immigrant health, immigrant health, occupational exposure assessment and epidemiology, occupational health disparities, nail salons.

Jessie Kemmick Pintor, PhD, MPH *(University of Minnesota)*. Assistant Professor. Department of Health Management and Policy. Community based participatory research; immigrant health; health disparities; health services research; health policy; maternal & child health; mixed methods; immigration policy.

Ann Klassen, PhD *(Johns Hopkins University)*. Professor. Department of Community Health and Prevention. Cancer and chronic disease disparities, urban health, minority, immigrant and global health, tobacco control, nutrition, health communication, qualitative and mixed methods, place-based and spatial analysis.

Jennifer Kolker, MPH *(University of Michigan) Associate Dean for Public Health Practice; Director of Executive MPH Program.* Associate Clinical Professor. Department of Health Management and Policy. Public health policy and practice, workforce training, safety net programs, urban health issues; health department infrastructure and financing.

Shiriki Kumanyika, PhD, MS, MPH *(Cornell University)*. Research Professor. Department of Community Health and Prevention. Solutions to obesity and diet-related diseases in black children and adults, Ethnic

disparities in obesity in the US and other high-income countries, "Culture of health" approaches in black communities, Assessment of food environments, Environmental influences on lifestyle changes, Targeted marketing of unhealthy foods and beverages, Food and nutrition policy, Evidence-based public health, Social determinants of health and health equity, Systems science applications in public health.

Brent Langellier, PhD, MA *(University of California, Los Angelos)*. Assistant Professor. Department of Health Management and Policy. Health and health care disparities, Latino health, complex systems, quantitative methods, GIS.

Stephen E. Lankenau, PhD *(University of Maryland) Associate Dean for Research*. Professor. Department of Community Health and Prevention. HIV/AIDS, overdose prevention, prescription drug misuse, medical marijuana, injection drug use, high risk youth, homelessness.

Felice Le-Scherban, PhD, MPH *(University of Michigan)*. Assistant Professor. Department of Epidemiology and Biostatistics. Life course approaches to socioeconomic, racial, and ethnic health disparities; social determinants of health among immigrants; causal links between education and health; analytic methods in social epidemiology.

Michael LeVasseur, PhD *(Drexel University)*. Visiting Assistant Professor. Data Analysis Methods, Health Disparities, Infectious Disease,Reproductive or Sexual Health

Brian K. Lee, PhD *(Johns Hopkins University)*. Associate Professor. Department of Epidemiology and Biostatistics. Environmental determinants and epidemiology of autism spectrum disorders; perinatal epidemiology; child and material health; neuropsychiatric epidemiology, causal inference; machine learning.

Nora L. Lee, PhD *(Johns Hopkins University)*. Assistant Research Professor. Department of Epidemiology and Biostatistics. Perinatal epidemiology; preterm birth; infant mortality; autism spectrum disorders; maternal and child health; racial and ethnic health disparities; secondhand smoke; tobacco control; environmental exposures.

Longjian Liu, MD, PhD, MSc, FAHA *(The University of Hong Kong)*. Associate Professor. Department of Epidemiology and Biostatistics. Cardiovascular disease and diabetes epidemiology; Pharmacoepidemiology; Burden of disease and health disparity; Hospital EHRs data for disease risk surveillance and prediction; Air pollution and urban health.

Gina Lovasi, PhD, MPH *(University of Washington) Co-Director of the Urban Health Collaborative*. Dornsife Associate Professor. Department of Epidemiology and Biostatistics. Cardiovascular disease; data analysis methods; health and place or build environment; health disparities; spatial analysis or GIS; urban health; urban trees and greenspace; local retail; transportation, infrastructure and policies.

Ana Martinez-Donate, PhD *(Universidad Autonoma de Madrid, Spain)*. Associate Professor. Department of Community Health and Prevention. HIV prevention; tobacco control; obesity prevention; access to health services; Latino immigrants and other disadvantaged populations; development and evaluation of community-based interventions.

Philip Massey, PhD, MPH *(University of California, Los Angeles)*. Assistant Professor. Department of Community Health and Prevention. Health communication, health literacy, mHealth, social media and health, adolescent health, global health, program evaluation, quantitative methods.

Leslie McClure, PhD, MPH *(University of Michigan) Chair*. Professor. Department of Epidemiology and Biostatistics. Design, management and analysis of randomized clinical trials; issues of multiplicity in clinical trials; environmental risk factors for cardiovascular disease and stroke; geographic and racial disparities in cardiovascular disease and stroke.

Yvonne Michael, ScD *(Harvard University)*. Associate Professor. Department of Epidemiology and Biostatistics. Epidemiology of aging, social epidemiology, women's health, community-based participatory research; health disparities.

Jana M. Mossey, PhD, MPH, MSN *(University of North Carolina at Chapel Hill)*. Professor Emerita. Department of Epidemiology and Biostatistics. Epidemiological methods; research design and methods including observational and clinical trials research; psychosocial aspects of health; epidemiology of aging and pain, psychiatric epidemiology including major depression; sub-threshold and minor depression.

Alex Ortega, PhD *(University of Michigan) Chair; Director, Center for Population Health and Community Impact*. Professor. Department of Health Management and Policy. Epidemiological methods in health services research; health needs of Latino children and families; health disparities intervention research; youth engagement in community interventions.

Sungchul Park, PhD, MPH *(University of Washington)*. Assistant Professor. Department of Health Management and Policy. Health economics; health policy; health services research; health disparities; Medicare; managed care; statistical modelling; and data analysis methods.

Jonathan Purtle, DRPH, MPH, MsC *(Drexel University)*. Assistant Professor. Department of Health Management and Policy. Mental health policy and services research; policy dissemination and implementation research; traumatic stress in urban areas; trauma-informed system design; violence prevention; political institutions and health.

Harrison Quick, PhD *(University of Minnesota)*. Assistant Professor. Department of Epidemiology and Biostatistics. Bayesian inference; spatial and spatiotemporal data analysis; statistical disclosure limitation.

Alex Quistberg, PhD, MPH *(University of Washington)*. Assistant Research Professor. Department of Environmental and Occupational Health. Data analysis methods, global health or international health, health and place or built environment, health disparities, spatial analysis or GIS, urban health, intentional/violent injury and trauma, unintentional injury and trauma.

John A. Rich, MD, MPH *(Duke University) Director, Center for Nonviolence and Social Justice*. Professor. Department of Health Management and Policy. Health disparities; men's health; violence; urban health issues; primary care.

Lucy Robinson, PhD *(Columbia University)*. Assistant Professor. Department of Epidemiology and Biostatistics. Statistics, modeling and analysis of neuroimaging and CT image data, network modeling, spatio-temporal data, computational statistics, and functional data analysis.

Alexis Roth, PhD, MPH *(Indiana University)*. Assistant Professor. Department of Community Health and Prevention. HIV/AIDS; sexually transmitted infections; individual, dyadic, and structural determinants of health; technology and health; mixed methods research; community-engagement and participatory research.

Brisa Sanchez, PhD *(Harvard University)*. Dornsife Endowed Professor. Department of Epidemiology and Biostatistics. Statistical methods development, big data, data integration for environment studies, health disparities, environment exposure, built environment.

Ayden Scheim, PhD *(Western University, Canada)*. Assistant Professor. Department of Epidemiology and Biostatistics. Social epidemiology, health disparities, global health, HIV/AIDS, LGBT health, injection drug use, research methods for small and hidden populations, community-based participatory research.

Ayden Scheim, PhD *(Western Universtiy)*. Assistant Professor. Global Health or International health, Infectious Disease, Substance Use, Community Based Participatory Research,Social Epidemiology, Survey Research Methods, HIV/AIDS, LGBT Health.

Leah Schinasi, PhD *(University of North Carolina)*. Assistant Research Professor. Department of Environmental and Occupational Health. Health and place or built environment, occupational health, urban health, environmental health, environmental justice, environmental epidemiology, climate change.

Randall L. Sell, ScD *(Harvard University)*. Professor. Department of Community Health and Prevention. Demography; Defining and measuring sexual orientations, gender and sex; Sampling sexual and gender minorities for public health research.

Suruchi Sood, PhD *(University of New Mexico)*. Associate Professor. Department of Community Health and Prevention. Human rights and health; nutrition; poverty; health disparities; innovation diffusion; HIV/AIDS; violence; community-based participatory research; application of statistics to behavioral, biological and medical sciences; adolescent health; maternal and child health; international health; program evaluation; women's health; mixed methods; qualitative methods.

Jim Stimpson, PhD *(University of Nebraska) Associate Dean for Academic Affairs*. Professor. Department of Health Management and Policy. Health policy; Health services research; Health disparities; Immigrant health; Health and place or built environment; Urban health; Medical sociology.

Thersa Sweet, PhD, MPH *(University of Michigan)*. Associate Teaching Professor. Department of Epidemiology and Biostatistics. Molecular and infectious disease epidemiology, including virology, cancer biology, hospital infection control and prevention; epidemiologic studies involving HIV risk in sexual minorities.

Loni Philip Tabb, PhD *(Harvard University)*. Associate Professor. Department of Epidemiology and Biostatistics. Methods for categorical, missing and hierarchical data; spatial epidemiology/statistics, Bayesian inference, and disease mapping.

Jennifer A. Taylor, PhD, MPH, CPPH *(Johns Hopkins University)*. Associate Professor. Department of Environmental and Occupational Health. Injury prevention, patient safety, healthcare quality, organizational culture, occupational safety, data policy and surveillance, first responders, healthcare workforce.

Renee M. Turchi, MD, MPH *(Johns Hopkins University) Joint appointment in the Drexel University College of Medicine*. Associate Professor. Department of Community Health and Prevention. Medical Home; children and youth with special health care needs; care coordination; cultural competency and access to care; maternal and child health policy, teaching, community partners.

Augusta M. Villanueva, PhD *(University of Texas at Austin)*. Associate Professor. Department of Community Health and Prevention. Role of race, culture, and ethnicity on health status/outcomes; community-based participatory research; immigrant communities; academic service-learning.

Seth Welles, PhD, ScD *(Harvard University)*. Professor. Department of Epidemiology and Biostatistics. Psychosocial risk for HIV infection and STIs among sexual and gender minority adults and adolescents; correction of misclassification of sexuality and its impact on measurement of HIV/STI risk; agent-based model simulation of HIV and STI incidence among persons with substantial risk for acquiring infection; impact of life course sexual trauma and violence on mental health conditions, substance abuse, and HIV risk; HIV natural history, pathogenesis and clinical trials.

Michael Yudell, MPH, PhD *(Columbia University) Chair, Department of Community Health*. Associate Professor. Department of Community Health and Prevention. Public health ethics; history of public health; race and racism; autism.

Issa Zakeri, PhD *(University of Illinois and Urbana-Champaign)*. Professor. Department of Epidemiology and Biostatistics. Biostatistics, functional data analysis, longitudinal data analysis, multivariate analysis, statistical learning.

Public Health

Major: Public Health
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 181.0
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 51.2201
Standard Occupational Classification (SOC) code: 11-9111

About the Program

Public health is the science of protecting and improving the health and well-being of communities. Where clinical professionals such as doctors and nurses focus on treating individuals after they become sick or are injured, public health professional are concerned with the health of entire populations, attempting to prevent problems from occurring or recurring through education, policy development, advocacy, service and research.

Reflecting the interdisciplinary approach of the Dornsife School of Public Health (https://drexel.edu/dornsife/), students in the major will take courses originating from the various public health core disciplines, which include epidemiology, community health and prevention, environmental and occupational health, and health management and policy. The diversity in course offerings provides the students with the general foundations of each discipline within public health. Student learning is enhanced by faculty expertise from a wide array of backgrounds ranging from epidemiology, community health, global health, sociology, psychology, medicine, health policy, health economics, industrial hygiene and anthropology in addition to many more. As the students progress through the major, they will gain more breath and depth in the specific discipline of their choosing through the co-op experience as well as the capstone courses in their senior year.

The Dornsife School of Public Health is dedicated to the integration of social justice and human rights in academic public health and being a model for interdisciplinary collaboration and civic engagement.

Additionally, a commitment to global engagement is core to the School's mission. The Global Public Health Initiative was created to provide opportunities for all public health student to gain rich and meaningful experiences working on health issues that transcend national boundaries or that may be influenced by circumstances or experiences in other countries.

Upon completion of the degree, students will be better equipped to complete graduate education in public health or health sciences. Students will have acquired skills that could be translated into the workplace (city, state or local government, non for profit, etc.) or other post baccalaureate educational settings such as an MPH, JD or MD.

Goals and Objectives

By the conclusion of the major, all students will be able to:

- Illustrate the interdisciplinary nature of public health in disease prevention and health promotion on both individuals and populations.
- Recognize the interconnectedness between physical and natural sciences and how each address population-based health challenges.
- Illustrate the fundamental relationship between health and human rights and the role of social justice and ethics.
- Highlight the important role that epidemiology and surveillance play in shaping and protecting the health of populations.
- Recognize the importance of historical context regarding public health milestones as they shape policies and programs.
- Obtain a greater understanding of the role of culture and values and how they influence relationships between social determinants of health and the built environment.
- Identify and address population health challenges through the various public health concentrations.
- Illustrate the overarching role that the social determinants of health have in promoting or hindering health.
- Acquire a working knowledge of the US healthcare and healthcare delivery system.

Additional Information

For more information about this program, please contact:

Erin Durkin, M.S.
Senior Academic Advisor
eed57@drexel.edu
267-359-6015

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COM 230	Techniques of Speaking	3.0
COM 320 [WI]	Science Writing	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PBHL 101	Public Health 101	3.0
UNIV PH101	The Drexel Experience	1.0
Students must select one of the following math sequences:		12.0
MATH 101 & MATH 102 & MATH 239	Introduction to Analysis I and Introduction to Analysis II and Mathematics for the Life Sciences	
Or		
MATH 121 & MATH 122 & MATH 123	Calculus I and Calculus II and Calculus III	
Physical and Life Sciences Requirements		**16.0**
Students must select one of the following biology sequences:		
BIO 107 & BIO 108 & BIO 109 & BIO 110	Cells, Genetics & Physiology and Cells, Genetics and Physiology Laboratory and Biological Diversity, Ecology & Evolution and Biological Diversity, Ecology and Evolution Laboratory	
Or		
BIO 122 & BIO 124 & BIO 126	Cells and Genetics and Evolution & Organismal Diversity and Physiology and Ecology	

*Please note that student who take the BIO 122, BIO 124, and BIO 126 sequence will be required to take fewer free electives.

Students must select one of the following chemistry sequences:		
CHEM 111 & CHEM 112	General Chemistry I and General Chemistry II	
Or		
CHEM 101 & CHEM 102	General Chemistry I and General Chemistry II	
Social Science Requirements		
PSY 101	General Psychology I	3.0
SOC 101	Introduction to Sociology	3.0
Social Science Electives:		**37.0**
ANTH 240	Urban Anthropology	
ANTH 250	Anthropology of Immigration	
ANTH 370	Ethnographic Methods	
ECON 201	Principles of Microeconomics	
ECON 202	Principles of Macroeconomics	
ECON 240	Economics of Health Care Systems	
ENSS 244	Sociology of the Environment	
ENVE 455	Geographic Information Systems	
ENVS 341	Equatorial Guinea: Society & Environment	
HIST 222	History of Work & Workers in America	
HRMT 323	Principles of Human Resource Administration	
HSAD 210	Health-Care Ethics I	
MIS 200	Management Information Systems	
ORGB 300 [WI]	Organizational Behavior	
PBHL 305	Women and Children: Health & Society	
PBHL 307	Injury Prevention and Control	
PBHL 310	Burden of Disease	
PBHL 316	Drugs, Society, and Public Health	
PBHL 318	Violence and Trauma in Public Health	
PBHL 333	Health Inequality	
PHIL 321	Biomedical Ethics	
PSCI 353	International Human Rights	
PSY 120	Developmental Psychology	
PSY 240 [WI]	Abnormal Psychology	
PSY 250 [WI]	Industrial Psychology	
PSY 368	Psychology - Inequity & Injustice	
SOC 115	Social Problems	
SOC 210	Race, Ethnicity and Social Inequality	
SOC 235	Sociology of Health and Illness	
WGST 275	Women's Health and Human Rights	

Public Heath Core Course Requirements

PBHL 301	Epidemiology in Public Health	3.0
PBHL 302	Introduction to the History of Public Health	3.0
PBHL 303	Overview of Issues in Global Health	3.0
PBHL 304	Introduction to Health & Human Rights	3.0
PBHL 308	The U.S. Public Health System	3.0
PBHL 314	Environmental and Occupational Health	3.0

Interdisciplinary Public Health Requirements

Select 1 course from each PH Department - CHP, EOH, EPI, and HMP	12.0
Select 12 additional PH course credits	12.0

Public Health Capstone Experience

PBHL 497	Capstone Experience I	3.0
PBHL 498	Capstone Experience II	3.0
PBHL 499	Capstone Experience III	3.0
Free Electives		**39.0**
Total Credits		181.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1

		Credits
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
MATH 101 or 121	Introduction to Analysis I / Calculus I	4.0
PBHL 101	Public Health 101	3.0
UNIV PH101	The Drexel Experience	1.0
	Term Credits	15.0

Term 2

BIO 109	Biological Diversity, Ecology & Evolution	3.0
BIO 110	Biological Diversity, Ecology and Evolution Laboratory	1.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
MATH 102 or 122	Introduction to Analysis II / Calculus II	4.0
PSY 101	General Psychology I	3.0
	Term Credits	15.0

Term 3

ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
MATH 239 or 123	Mathematics for the Life Sciences / Calculus III	4.0
SOC 101	Introduction to Sociology	3.0
Free electives		6.0
	Term Credits	16.0

Term 4

CHEM 111	General Chemistry I	4.0
PBHL 303	Overview of Issues in Global Health	3.0
Interdisciplinary Public Health Requirement		3.0
Social Science electives		6.0
	Term Credits	16.0

Term 5

CHEM 112	General Chemistry II	4.0
PBHL 301	Epidemiology in Public Health	3.0
PBHL 302	Introduction to the History of Public Health	3.0
Interdisciplinary Public Health Requirement		6.0
	Term Credits	16.0

Term 6

COM 230	Techniques of Speaking	3.0
PBHL 304	Introduction to Health & Human Rights	3.0
PBHL 314	Environmental and Occupational Health	3.0
Free elective		6.0
	Term Credits	15.0

Term 7

Free elective	3.0
Social Science electives	7.0
Interdisciplinary Public Health Requirement	6.0
Term Credits	16.0

Term 8

PBHL 308	The U.S. Public Health System	3.0
Free elective		3.0
Interdisciplinary Public Health Requirement		3.0
Social Science electives		6.0
	Term Credits	15.0

Term 9

COM 320 [WI]	Science Writing	3.0
Interdisciplinary Public Health Requirement		3.0
Social Science electives		6.0
	Term Credits	12.0

Term 10

PBHL 497	Capstone Experience I	3.0
Social Science electives		6.0
Free electives		6.0
	Term Credits	15.0

Term 11

PBHL 498	Capstone Experience II	3.0
Social Science electives		6.0
Free electives		6.0
	Term Credits	15.0

Term 12

PBHL 499	Capstone Experience III	3.0
Interdisciplinary Public Health Requirement		3.0

Free electives		9.0
Term Credits		15.0

Total Credit: 181.0

Accelerated Public Health BS/MPH

Major: Public Health
Degree Awarded: Bachelor of Science (BS) and Master of Public Health (MPH)
Calendar Type: Quarter
Total Credit Hours: 237
Co-op Options: One Co-op (Five years)
Classification of Instructional Programs (CIP) code: 51.2201
Standard Occupational Classification (SOC) code: 11-9111; 21-1091, 21-1094, 25-1071

About the Program

The Dornsife School of Public Health offers an accelerated dual degree option with its undergraduate Public Health and Master of Public Health degrees. Participants can earn both a BS degree in Public Health and a Master of Public Health (MPH) degree in five years.

In this accelerated dual degree program, students participate in the undergraduate program for four full years (including one co-operative experience). After two years of undergraduate study students begin their graduate studies in the Master of Public Health program. The third and fourth years are a mix of undergraduate and graduate courses. After the successful completion of their fourth year, students receive their BS. When students successfully complete the remainder of their graduate studies (typically one additional year/ three graduate quarters), they will receive the MPH degree.

Students admitted to the accelerated, dual degree program apply to the graduate Master of Public Health Program during their junior year. Those admitted students must verify their intent to continue in the program with their advisor by the end of the spring term of year two.

Matriculated (continuing) students seeking admissions to the Dornsife School of Public Health BS/MPH accelerated program must verify their intent to participate in the program by the start of the fall term in their sophomore year. All students then follow the same application procedures as other applicants, including being interviewed by the graduate faculty. (Any student who does not meet the entrance requirements of the graduate program will be able to complete the fourth year of the Public Health undergraduate program and receive a BS degree.)

Students in the Master of Public Health program complete 56.0 graduate quarter credits to meet the requirements of the master's program.

Additional Information

For more information about this program, please contact:

Erin Durkin, M.S.
Senior Academic Advisor
eed57@drexel.edu
267-359-6015

Admission Requirements

- Be currently enrolled in the 4 year, 1 COOP program for Undergraduate Public Health.
- Maintain a minimum overall GPA in line with the auto admit criteria for the MPH program.
- Ability to simultaneously take undergraduate and MPH courses during junior and senior year.
- Complete the prerequisite courses necessary for admission into the MPH program with no lower than a "C" grade.
- Obtain one written recommendation from a faculty member and one written recommendation from an advisor, supervisor or mentor.
- Complete the online SOPHAS application to the MPH program at the Dornsife School of Public Health in junior year.

Degree Requirements

General Education Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COM 230	Techniques of Speaking	3.0
COM 320 [WI]	Science Writing	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PBHL 101	Public Health 101	3.0
UNIV PH101	The Drexel Experience	1.0
Students must select one of the following math sequences:		12.0
MATH 101	Introduction to Analysis I	
& MATH 102	and Introduction to Analysis II	
& MATH 239	and Mathematics for the Life Sciences	
Or		
MATH 121	Calculus I	
& MATH 122	and Calculus II	
& MATH 123	and Calculus III	
Physical and Life Sciences Requirements [*]		**16.0**
BIO 107	Cells, Genetics & Physiology	
& BIO 108	and Cells, Genetics and Physiology Laboratory	
& BIO 109	and Biological Diversity, Ecology & Evolution	
& BIO 110	and Biological Diversity, Ecology and Evolution Laboratory	
Or		
BIO 122	Cells and Genetics	
& BIO 124	and Evolution & Organismal Diversity	
& BIO 126	and Physiology and Ecology	
Students must select one of thr following chemistry sequences:		
CHEM 111	General Chemistry I	
& CHEM 112	and General Chemistry II	
Or		
CHEM 101	General Chemistry I	
& CHEM 102	and General Chemistry II	
Social Science Requirements		
PSY 101	General Psychology I	3.0
SOC 101	Introduction to Sociology	3.0
Social Science Electives		37.0
ANTH 240	Urban Anthropology	
ANTH 250	Anthropology of Immigration	
ANTH 370	Ethnographic Methods	
ECON 201	Principles of Microeconomics	
ECON 202	Principles of Macroeconomics	
ECON 240	Economics of Health Care Systems	
ENVS 341	Equatorial Guinea: Society & Environment	

ENVE 455	Geographic Information Systems	
ENSS 244	Sociology of the Environment	
HIST 222	History of Work & Workers in America	
HRMT 323	Principles of Human Resource Administration	
HSAD 210	Health-Care Ethics I	
MIS 200	Management Information Systems	
ORGB 300 [WI]	Organizational Behavior	
PBHL 305	Women and Children: Health & Society	
PBHL 307	Injury Prevention and Control	
PBHL 310	Burden of Disease	
PBHL 316	Drugs, Society, and Public Health	
PBHL 318	Violence and Trauma in Public Health	
PBHL 333	Health Inequality	
PHIL 321	Biomedical Ethics	
PSCI 353	International Human Rights	
PSY 120	Developmental Psychology	
PSY 240 [WI]	Abnormal Psychology	
PSY 250 [WI]	Industrial Psychology	
PSY 368	Psychology - Inequity & Injustice	
SOC 115	Social Problems	
SOC 210	Race, Ethnicity and Social Inequality	
SOC 235	Sociology of Health and Illness	
WGST 275	Women's Health and Human Rights	
Public Health Core Course Requirements		
PBHL 301	Epidemiology in Public Health	3.0
PBHL 302	Introduction to the History of Public Health	3.0
PBHL 303	Overview of Issues in Global Health	3.0
PBHL 304	Introduction to Health & Human Rights	3.0
PBHL 308	The U.S. Public Health System	3.0
PBHL 314	Environmental and Occupational Health	3.0
Interdisciplinary Public Health Requirements		
Select one course from each PH Department - CHP, EOH, EPI, HMP		12.0
Select 12 course credits from any other PH Courses		12.0
Public Health Capstone Experience		
PBHL 497	Capstone Experience I	3.0
PBHL 498	Capstone Experience II	3.0
PBHL 499	Capstone Experience III	3.0
Free Electives		39.0-42.0
MPH Core Requirements		
PBHL 500	Practical Experience for the Master of Public Health	0.0
PBHL 510	Public Health Foundations and Systems I	4.0
PBHL 511	Public Health Foundations and Systems II	4.0
PBHL 512	Methods for Public Health Research I	4.0
PBHL 513	Methods for Public Health Research II	4.0
MPH Discipline Specific Foundation Courses		16.0
MPH Integrative Learning Experience **		6.0
MPH Electives/Graduate Minor Courses		18.0
Total Credits		237.0-240.0

* Please note that students who take the BIO 122, BIO 124, and BIO 126 sequence will be required to take fewer free electives

** Integrated Learning Experience courses depend on the MPH major. Community Health & Prevention: CHP 750 and CHP 751; Environmental & Occupational Health: EOH 750 and EOH 751; Epidemiology: EOH 750 and EOH 751; Health Management & Policy: HMP 750 and HMP 751.

Sample Plan of Study

First Year

Fall		Credits
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
MATH 101 or 121	Introduction to Analysis I Calculus I	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
PBHL 101	Public Health 101	3.0
UNIV PH101	The Drexel Experience	1.0
	Term Credits	15.0

Winter		
BIO 109	Biological Diversity, Ecology & Evolution	3.0
BIO 110	Biological Diversity, Ecology and Evolution Laboratory	1.0
CIVC 101	Introduction to Civic Engagement	1.0
MATH 102 or 122	Introduction to Analysis II Calculus II	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
PSY 101	General Psychology I	3.0
	Term Credits	15.0

Spring		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 239	Mathematics for the Life Sciences	4.0
SOC 101	Introduction to Sociology	3.0
Free electives		6.0
	Term Credits	16.0

Second Year

Fall		
CHEM 111	General Chemistry I	4.0
PBHL 303	Overview of Issues in Global Health	3.0
PBHL 304	Introduction to Health & Human Rights	3.0
Social Science electives		3.0
Free elective		6.0
	Term Credits	19.0

Winter		
CHEM 112	General Chemistry II	4.0
PBHL 301	Epidemiology in Public Health	3.0
PBHL 302	Introduction to the History of Public Health	3.0
Interdisciplinary Public Health Requirement		3.0
Free elective		3.0
	Term Credits	16.0

Spring		
COM 230	Techniques of Speaking	3.0
PBHL 314	Environmental and Occupational Health	3.0
Interdisciplinary Public Health Requirements		6.0
Social Science elective		3.0
Free elective		3.0
	Term Credits	18.0

Summer		
Social Science electives		7.0
Interdisciplinary Public Health Requirements		6.0
Free elective		3.0
	Term Credits	16.0

Third Year

Fall		
EPI 570	Introduction to Epidemiology	3.0
PBHL 308	The U.S. Public Health System	3.0

Social Science elective		6.0
Interdisciplinary Public Health Requirement		3.0
Free elective		3.0
	Term Credits	18.0
Winter		
BST 571	Introduction to Biostatistics	3.0
COM 320 [WI]	Science Writing	3.0
Social Science elective		6.0
Interdisciplinary Public Health Requirement		3.0
Free elective		3.0
	Term Credits	18.0
Spring		
HMP 505	Qualitative Data and Mixed Methods Analysis	2.0
Co-op		
	Term Credits	2.0
Summer		
Co-op		
	Term Credits	0.0
Fourth Year		
Fall		
PBHL 497	Capstone Experience I	3.0
PBHL 510	Public Health Foundations and Systems I	4.0
Social Science elective		6.0
Free elective		3.0
	Term Credits	16.0
Winter		
PBHL 498	Capstone Experience II	3.0
PBHL 511	Public Health Foundations and Systems II	4.0
Social Science elective		6.0
Free electives		3.0
	Term Credits	16.0
Spring		
PBHL 499	Capstone Experience III	3.0
PBHL 500	Practical Experience for the Master of Public Health	0.0
Free elective		6.0
Discipline Specific MPH Course		4.0
MPH Elective/Graduate Minor Course		3.0
Interdisciplinary Public Health Requirement		3.0
	Term Credits	19.0
Fifth Year		
Fall		
Integrative Learning Experience I		
CHP 750, EOH 750, EPI 750, or HMP 750	Integrative Learning Experience in Community Health & Prevention I Integrative Learning Experience: Environmental and Occupational Health I Integrative Learning Experience in Epidemiology I Integrative Learning Experience	3.0
Discipline Specific MPH course		3.0
MPH Elective/Graduate Minor Courses		6.0
	Term Credits	12.0
Winter		
Integrated Learning Experience II		
CHP 751, EOH 751, EPI 751, or HMP 751	Integrative Learning Experience in Community Health & Prevention II Integrative Learning Experience: Environmental and Occupational Health II Integrative Learning Experience in Epidemiology II Integrative Learning Experience II	3.0
Discipline Specific MPH course		3.0
MPH Elective/Graduate Minor Course		6.0
	Term Credits	12.0
Spring		
MPH Elective/Graduate Minor Course		3.0

Discipline Specific Courses		6.0
	Term Credits	9.0

Total Credit: 237.0

Minor in Global Public Health

About the Minor

The Global Health minor is intended to complement any academic major offered at Drexel and to provide students with basic knowledge about global public health as well as the necessary skills and experience to begin to build their own unique global health career.

The minor will be open to all undergraduate students in all schools and colleges, and is designed around three specific educational objectives for students: to learn more about the problems of global public health in a classroom setting, to experience the issues in global health firsthand in a field setting, and to be exposed to the variety of careers available in global public health by working with faculty, professional staff, and graduate students who are currently engaged in the field.

Upon completion of the Global Health Minor, students are able to:

1. Analyze global health problems, issues and controversies using multiple disciplinary perspectives and conceptual frameworks,
2. Integrate knowledge from academic study and experiential learning toward being active and informed citizens in a global community,
3. Demonstrate the capacity to critically reflect on one's own values, ethics, assumptions and actions in the context of cultures, collaborations and institutions; and
4. Demonstrate the capacity to collaborate across differences (e.g. cultural, social, personal, economic, values, religious).

Requirements for admission

- Undergraduate students with at least 30 credits
- Undergraduate students in good academic standing

Please note: PBHL 101 is a prerequisite for all required PBHL courses in this minor.

It is strongly suggested that students in this minor participate in a field experience which can include an elective course or co-op.

Required courses:

PBHL 301	Epidemiology in Public Health	3.0
PBHL 303	Overview of Issues in Global Health	3.0
PBHL 304	Introduction to Health & Human Rights	3.0
PBHL 317	The World's Water	3.0
Elective Courses: take 12 credits of the following:		12.0
COM 390 [WI]	Global Journalism	
ECON 342	Economic Development	
PBHL 320	Exploring the HIV/AIDS Pandemic	
PBHL 321	Disease Outbreak Investigations	
PHIL 335	Global Ethical Issues	
WGST 225	Women & Human Rights Worldwide	
WGST 240	Women and Society in a Global Context	
Total Credits		24.0

Additional Information

For more information about this program, please contact:

Erin Durkin, M.S.

Senior Academic Advisor
eed57@drexel.edu
267-359-6015

Minor in Public Health

About the Minor

The Dornsife School of Public Health trains new leaders to tackle society's current and future health challenges. The Public Health minor is designed to provide students with a broad overview of the field's diversity. Reflecting the interdisciplinary approach of the School, students are required to take courses originating from various public health core disciplines, which include: epidemiology; community health and prevention; environmental and occupational health; and health management and policy.

This minor will be a relevant course of study for students pursuing pre-med, pre-law, biology and business curricula as well as students interested in population-based applications of psychology, sociology and communications theory. Completion of the minor will provide students with an exposure to the breadth and depth of topics within public health, population-level challenges and solutions, as well as possible career options.

Requirements

Please note: PBHL 101 is a prerequisite for all required PBHL courses in this minor.

Required Courses		
PBHL 301	Epidemiology in Public Health	3.0
PBHL 302	Introduction to the History of Public Health	3.0
PBHL 303	Overview of Issues in Global Health	3.0
PBHL 304	Introduction to Health & Human Rights	3.0
Elective Choices		
Complete 12 credits from the following courses:		12.0
BIO 318	Biology of Cancer	
ECON 240	Economics of Health Care Systems	
HSAD 210	Health-Care Ethics I	
PBHL 305	Women and Children: Health & Society	
PBHL 306	Introduction to Community Health	
PBHL 307	Injury Prevention and Control	
PBHL 308	The U.S. Public Health System	
PBHL 309	Public Health Ethics	
PBHL 310	Burden of Disease	
PBHL 311	Public Health Biology	
PBHL 312	Public Health Data Analysis	
PBHL 313	The Social Determinants of Health and Well-Being	
PBHL 314	Environmental and Occupational Health	
PBHL 315	Public Health Leadership	
PBHL 316	Drugs, Society, and Public Health	
PBHL 317	The World's Water	
PBHL 318	Violence and Trauma in Public Health	
PBHL 333	Health Inequality	
PHIL 321	Biomedical Ethics	
PSCI 353	International Human Rights	
PSY 355	Health Psychology	
PSY 368	Psychology - Inequity & Injustice	
SOC 210	Race, Ethnicity and Social Inequality	
SOC 220	Wealth and Power	
SOC 235	Sociology of Health and Illness	

WGST 275	Women's Health and Human Rights	
Total Credits		24.0

Additional Information

For more information about this program, please contact:

Erin Durkin, M.S.
Senior Academic Advisor
eed57@drexel.edu
267-359-6015

Goodwin College of Professional Studies

In today's competitive job market, education is a smart investment in your future. Goodwin responds to the demands of today's learner by offering programs that tailor a student's learning experience to their career aspirations. Our General Studies degree-completion program is ideal for transfer students who already possess an associate's degree or just have existing college credits. It is also ideal for students who wish to chart their own path toward a college degree.

Major

- General Studies (BS) (p. 350)

Minor

- Client Development and Customer Service (p. 351)

General Studies

Major: General Studies
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.0
Classification of Instructional Programs (CIP) code: 24.0101
Standard Occupational Classification (SOC) code: 11-9199

About the Program

The Bachelor of Science (BS) in General Studies is the ideal degree completion program for self-directed students who desire a program they can tailor to their personal and professional interests. The program covers the fundamentals of a university education while allowing students to exhibit intellectual interest and discipline across a broad range of college-level coursework. A general studies degree informs employers of a graduate's ability to think creatively when problem solving and work independently at a high level with a minimum of direction.

General studies students have more options for courses which apply to their degree requirements when they register for a given term. The flexibility to study subjects which have produced some of the greatest ideas, innovations and art in recorded history, can be both a personally and professionally rewarding benefit of a general studies degree.

Designed for individuals with a diverse college background and varied educational interests that cannot be captured in a single degree program. Students have the opportunity to experiment in a variety of academic subjects through a generous amount of free electives.

The ability to include minors (http://catalog.drexel.edu/minors/)within the General Studies major can be of great value to working adults who are seeking advancement or a change in their employment. Adult learners looking to improve their earning potential often find that a degree makes them eligible for higher-level positions within their organizations or others.

The Goodwin General Studies degree completion program offers students evening and online options to make it as convenient as possible for working adults to take advantage of the opportunity to return to school and complete their college degree.

Advising

Students in the BS in General Studies program are advised by an academic advisor (determined alphabetically by last name) who serves as an important resource to students as they progress and manage their educational and career goals.

Students receive one-on-one personal advisement to ensure that educational and professional objectives are met within the course of study.

For more information on this major, visit Goodwin College's (https://drexel.edu/goodwin/academics/degree-completion-programs/bs-general-studies/) web page.

Degree Requirements

This program is designed for individuals with a diverse college background and varied educational interests that cannot be captured in a single degree program. In consultation with their academic advisor, students have the opportunity to experiment in a variety of academic subjects through a generous amount of free electives. An attractive feature is that students can complete minors (http://catalog.drexel.edu/minors/) en route to their degree.

College Requirements		
GSTD 200	Lifelong Learning Theory & Practice	3.0
GSTD 491	Senior Project in General Studies	3.0
English and Speech Requirements		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
COM 230	Techniques of Speaking	3.0
Mathematics Requirements		
MATH 100	Fundamentals of Mathematics	3.0
MATH 171	Introduction to Analysis A	3.0
Computing Requirement [*]		
Select one of the following:		3.0
PRST 211	Computer Applications for Professionals	
Additional computing course options, with Advisor approval		
Upper Level Course Requirements		
As students choose electives from the categories below, a minimum of 36.0 credits must be upper-level courses (typically 300-level and above).		
Natural Science Electives		
Students select 9.0 credits from the following: ANAT, BIO, CHEM, FDSC, NFS, PHEV, PHYS. Courses from other departments may be considered with advisor approval.		9.0
Specialization Requirements		
Students must complete 45.0 credits within an area of specialization. The specialization is a set of courses built around a cohesive area of study. An academic advisor must pre-approve the specialization. The specialization will not appear on the student transcript.		45.0
Liberal Studies Requirements		
Students must complete 36.0 credits in Liberal Studies, covering a range of subject areas in the humanities and/or social sciences: anthropology, psychology, sociology, political science, history, philosophy, religion, literature and fine arts. (Arts history or appreciation courses, rather than applied courses.)		36.0
Free Electives		**63.0**
Total Credits		180.0

*   Courses older than three years will not be transferred into the curriculum.

Co-op/Career Opportunities

A well-rounded education results in an enriched view of the world. Full-time students majoring in General Studies find careers in diverse areas, taking skills they learn at Drexel to their future endeavors. The My College Guide (http://mycollegeguide.org/career-opportunities/general-studies-careers/) website identifies many career opportunities for students majoring in General Studies.

Goodwin College's General Studies BS degree is designed for students planning to pursue graduate studies in various professional areas.

Some General Studies students are already established in their careers and simply need a bachelor's degree to move into higher positions within their organizations and industries and/or to pursue a master's degree.

Alumni of the General Studies program include professions as:

- Senior Financial Consultant
- Professional Digital Marketing Consultant
- Rap Artist/Songwriter
- Assistant University Registrar
- Paralegal
- Mortgage Consultant
- Senior Project Manager
- Bank Manager
- Vice President, Technology
- Pharmaceutical Consultant
- Library Tech Specialist
- NYC Mayor's Office of Sustainability
- General Manager
- Realtor
- Clinical Medical Assistant

Client Development and Customer Service

About the Minor

The minor in Client Development and Customer Service is a 24.0 to 26.0 credit curriculum designed to familiarize students with customer service theory while providing practical training to develop skills for building and maintaining successful client relationships. The minor can provide a strong complement for majors that emphasize entrepreneurship, interpersonal skills, nonprofit enterprise and marketing. Students minoring in Client Development and Customer Service might also consider a double minor in Business Administration.

Admission Requirements

- Minimum GPA of 2.0
- Academic advisor approval
- Must be enrolled in an undergraduate degree program

Program Requirements

GSTD 201 [WI]	Professional Applications of Emotional Intelligence	3.0
GSTD 302	Customer Service Theory & Practice	3.0
GSTD 303	Client Relations Management	3.0
PRST 303	Interpersonal Skills for Virtual Teams	3.0
PRST 330	Career & Professional Development	3.0
PHIL 301	Business Ethics	3.0
Take a minimum of two courses from the list below		6.0
GSTD 360	Applied Organizational Research	
MKTG 321	Selling and Sales Management	
MKTG 344	Professional Personal Selling	
MKTG 357	Global Marketing	
MKTG 362	Brand and Reputation Management	
PRST 440	Policy Analysis	
Total Credits		24.0

A grade of "C" (2.0) or better must be earned in each course to be counted toward this minor.

LeBow College of Business

About the College

The mission of the LeBow College of Business is to integrate Drexel University's technological prominence with experience-based education to develop world-class leaders and advance knowledge through research. At the undergraduate level, this objective is accomplished by providing high-quality educational programs that integrate theory and practice. Drexel's highly regarded co-operative education program in which students interchange periods of academic study and full-time, off-campus employment with partner companies, sets us apart from other business schools

The College and its distinguished faculty are committed to advancing the science and practice of management through basic, applied, and instructional research in the various disciplines of business.The College maintains strong connections to business professions and the community through participation in professional organizations, a commitment to community service, and dedication to providing opportunities for lifelong learning. Drexel's LeBow College of Business—fully accredited by AASCB-International—offers two distinct undergraduate degrees, Bachelors of Science in Business Administration that has 10 major options and 5 co-majors, and Bachelors of Science in Business and Engineering, plus an option in thirteen minors and two certificate programs.

Majors

- Accounting (BSBA) (p. 355)
- Business Analytics (co-major) (BSBA) (p. 357)
- Business and Engineering (BSBAE) (p. 361)
- Business Economics (co-major) (BSBA) (p. 405)
- Finance (BSBA) (p. 364)
- General Business (BSBA) (p. 368)
- Legal Studies (BSBA) (p. 370)
- International Business (BSBA) (p. 408)
- International Business (co-major) (BSBA) (p. 411)
- Management Information Systems (BSBA) (p. 372)
- Marketing (BSBA) (p. 375)
- Operations and Supply Chain Management (BSBA) (p. 378)
- Organizational Management (co-major) (BSBA) (p. 381)
- Real Estate Management and Development (BSBA) (p. 383)
- **NEW:** Sport Business (BSBA)
- Technology Innovation Management (co-major) (BSBA) (p. 388)

Minors

- Accounting (p. 391)
- Business Administration (p. 391)
- Business Analytics (p. 392)
- **NEW:** Business Consulting
- Finance (p. 393)
- Legal Studies (p. 394)
- Management Information Systems (p. 394)
- Marketing (p. 394)

- Operations and Supply Chain Management (p. 395)
- Organizational Management (p. 395)
- Real Estate Management and Development (p. 396)
- Sport Management (p. 396)
- Technology Innovation Management (p. 397)

Certificates

- Brand and Reputation Management (p. 397)
- Social Responsibility in Business (p. 398)

About the College

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About the Curriculum

BS in Business Administration Program

The Bachelor of Science in Business Administration program is designed to prepare students for managerial positions in business and other institutions. To accomplish this, the undergraduate curriculum has the following characteristics and goals:

- An early exposure to the structure and functions of business enterprises
- The bridging of theory and concepts with professional practice
- The integration of material across disciplines within business as well as between business and other fields
- The enhancement of effective communication, problem-solving, and interpersonal skills
- Coverage of the ethical issues inherent in a business setting
- Coverage of the global, political, social, and legal/regulatory environment in which businesses operate
- Coverage of the impact of technology and technological changes on the operation of the business enterprise
- An emphasis on career preparation
- Opportunities for experiential learning through traditional co-op programs and other "hands-on" opportunities

BS in Business and Engineering Program

The Business and Engineering Degree Program contains a broad-based business and engineering curriculum, enabling graduates to work successfully in technically oriented business positions. Students complete a set of broad functional business core courses along with a firm foundation in science, mathematics, and engineering. Students also study more deeply the areas of accounting, economics, finance, information systems, law, marketing, organizational behavior, entrepreneurship, operations, and statistics along with the functional areas of engineering. Graduates of this program will be well prepared to participate in innovative technological efforts in business.

The Business and Engineering Degree Program gives students the opportunity to:

- Develop a breadth and depth of knowledge in functional business areas such as accounting, economics, entrepreneurship, finance, information systems, law, marketing, organizational behavior, operations, and statistics.
- Complete a broad education in engineering disciplines after completing a firm foundation in science and mathematics.
- Develop skills in technical communication and critical reasoning.
- Study ethical issues faced by managers and engineers, and understand technology from a historical perspective.
- Apply acquired skills from co-op work experiences to further enhance their knowledge base.
- Study entrepreneurship from a management and finance perspective for preparation in innovative technological efforts.
- Learn the operational aspects of business operations to improve the functioning of technically oriented businesses

BS in Economics Program

The Bachelor of Science in Economics program is designed to provide students with an understanding of the market system, as well as economic institutions, policies and development. In addition to this deep coverage of economics, the major includes liberal arts and sciences requirements. The program is flexible, allowing the student to customize the curriculum and choose areas of emphasis including concentrations in business economics or mathematical economics, as well as to select a coordinating field from other majors and minors at Drexel. The BS in Economics program provides excellent training for graduate school in economics.

BA in Economics Program

The Bachelor of Arts in Economics introduces students to modern economics within the context of a broad-based liberal arts curriculum. The degree is oriented toward students with interest in the less quantitative features of economics and a broader liberal arts education, particularly in areas offered by the College of Arts and Sciences. The degree gives students the flexibility to major or minor in a coordinate field outside of economics.

The Economics program:

- Provides a deep understanding of economics and broad training in arts and sciences.
- Enables students to apply acquired skills from co-op work experiences to further enhance their knowledge base.

- Prepares students for a wide variety of opportunities after graduations ranging from; corporate positions, consulting, government agencies, business, and law.
- Is a rigorous program that develops students' critical thinking and problem solving skills.

Degree Requirements

The Business Administration curriculum requires a minimum of 180.0 credits. The Business & Engineering curriculum requires a minimum of 183.0 credits. The Economics curriculum requires a minimum of 187.0 credits. The courses in each curriculum may be grouped into three categories:

General Education

The liberal arts comprise 50 percent or more of total credits required. Courses in communications, economics, English, history, mathematics, natural science, political science, psychology, sociology, and statistics teach students to think effectively and to communicate ideas to others. In addition, they provide a good understanding of the economic, social, and political systems within which we live and business operates.

Common Body of Knowledge in Business

Courses in accounting, business strategy and social responsibility, finance, law, organizational behavior, management information systems, production management, and marketing introduce students to all the functional areas of business, the quantitative aspects of decision-making, and the behavioral factors common to all organizational structures.

Major (BSBA) or Coordinated Field (BSECON & BAECON)

The curriculum permits students to pursue one or more majors within the (BSBA) programs. The major coursework and the common body of knowledge in business together comprise not more than 50 percent of the total credits required for graduation. In the Economic programs, students must select a coordinated field to augment the general education and economics course work.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Cooperative Education

The five-year cooperative education programs consist of 12 terms in college and six terms in co-operative employment. During the freshman year, students spend three terms in school (fall, winter, and spring) and have a summer vacation. For each of the next three years, students alternate two terms in school with two terms of co-op. The senior year consists of three terms in college with no cooperative employment.

The four-year cooperative education program consists of 12 terms in college and two terms in cooperative employment. The two terms of co-op experience take place in the third year.

The non-cooperative four-year program comprises 12 terms in school with vacations during the summers.

Cooperative education, academic eligibility requirements, acceptance of transfer students, and placement services are described in detail in other sections of this catalog. Students wishing to prepare for admission to professional schools may obtain preprofessional counseling from the Office of Preprofessional Programs, 215.895.2437.

Special Programs

Accelerated/Dual Degrees

LeBow College offers an accelerated BS/MBA and BS/MS degree programs that provides academically qualified students with the opportunity to earn both a bachelor's degree and an MBA or MS in Accounting in the time normally required for the undergraduate degree at Drexel University. The program combines the advantage of practical work experience in the renowned Drexel Co-op with the graduate credentials of our nationally recognized programs.

LeBow College also offers a five-year dual-degree program with the European Business School (ESB) at Reutlingen University in Germany. This exciting dual degree program allows undergraduate students to earn degrees from both Drexel University's LeBow College of Business and Reutlingen University's European School of Business. In total students will spend 18 months in Germany completing two semesters of study and one semester on Co-op.

Drexel in London

The College's *Drexel in London Program* offers flexible schedules for study abroad, ranging from six-week summer sessions to six-month (two-term) combined study and co-operative education programs in which students can earn up to 18 credits and fulfill one of their co-op requirements. The program's emphasis is on international business in general, with a particular focus on the United Kingdom and the European Union. Business course selections each year will be selected from the list of courses that constitute the international business concentration, but students in other concentrations may participate in the program. Housing is provided in South Kensington, one of central London's most desirable residential sections. Drexel in London applications are administered by the Study Abroad (http://www.drexel.edu/studyabroad/) office, 215.571.3558.

Business Learning Community (BLC)

LeBow College's Business Learning Community (BLC) is a way of life at Drexel University - a cohort of freshman business students who live and attend classes together. The BLC was recently recognized by AACSB Accreditation Committee as a "strength and effective practice of the LeBow College of Business." The program is designed to ease transition to university life, (http://catalog.drexel.edu/) enhance student academic performance, (http://catalog.drexel.edu/) provide opportunities for student engagement and networking and improve the overall student experience.

LeBow BRIDGE

BRIDGE is a LeBow College of Business undergraduate program that provides support to students in four critical areas: academic excellence, financial literacy and social engagement and community service. BRIDGE scholars receive the tools to be successful through advising programs related to academics, financial skills, professional development, cultural awareness and community service.

Students work together to build relationships within a dynamic and diverse group experience. Mentors are also available to BRIDGE scholars to provide guidance and ensure a positive college experience. After freshman year, BRIDGE scholars can serve as peer mentors to underclassmen.

Global Classroom

The LeBow Global Classroom program prepares candidates to become 21st Century Executives, able to tackle the toughest business challenges in our increasingly globalized business world. Each year a select cohort of 20 high-potential students from around the world enters this rigorous global education experience to acquire the complex set of skills and attitudes to thrive in an increasingly uncharted and globalized marketplace. The learning community experience is akin to a "Global Classroom".

Peer Leader Program

LeBow College's Peer Leader Program is an outstanding learning experience for sophomore business students. Through a highly competitive application process, top-performing LeBow students with extraordinary leadership potential are identified, selected, trained and paired with UNIV 101 instructors to serve as mentors for new freshmen both inside and outside the classroom.

Summer Institutes

LeBow Summer Institutes offer an introduction to business education through exceptional summer programs designed for outstanding high school students with an interest in business. LeBow Summer Institutes offer the opportunity to maximize and develop the business and leadership skills sought after by employers and college admissions officers.

Facilities

In fall 2013, LeBow College opened its 12-story, Gerri C. LeBow Hall, with a finance trading lab, behavioral studies lab and integrated teaching technology in all classrooms. The new building features two lecture halls, 15 classrooms of varying sizes and seating configurations, including case study rooms and cluster classrooms designed to facilitate group work. Other amenities consist of extensive areas of student spaces, including 19 collaboration rooms, two quiet study areas, and 3,500 square feet of student lounges. Gerri C. LeBow Hall brings together faculty, students and staff, in a state of the art building on the University City campus. Please visit the LeBow College of Business webpage (http://www.lebow.drexel.edu/about/campuses/philadelphia/location/gerri-c-lebow-hall/) to learn more about Gerri C. LeBow Hall.

Accounting

Major: Accounting
Degree Awarded: Bachelor of Science in Business Administration (BSBA)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 52.0305
Standard Occupational Classification (SOC) code: 13-2011; 11-3031; 13-2051

About the Program

Accounting is the language of business and so much more. It provides the critical information that guides decision-making at all levels of business, government and non-profit organizations. An Accounting degree offers students the opportunity to obtain technical knowledge, analytical skills and communication expertise required to lead ethical and effective organizations and people. Accounting graduates find career opportunities across many areas including public, private and government accounting.

There is a wide range of career opportunities for accountants which include public accounting, corporate and non-profit accounting, and governmental accounting. Many professional accountants obtain a license as a Certified Public Accountant (CPA) or obtain a Certified Managerial Accountant (CMA) designation after passing the examinations and completing all education and experience requirements. The University's co-op program provides practical experience for accounting students. Time spent working in accounting co-op positions is accepted as part of the experience requirement for Pennsylvania and many other states.

Students planning to obtain a CPA license must take additional coursework to meet state mandated requirements. Each state has different education requirements for licensure. Interested students should consult with their academic advisor and/or the Department of Accounting (https://www.lebow.drexel.edu/faculty-and-research/disciplines/accounting/) upon declaring the major to ensure ample time to fulfill such requirements.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Bachelor of Science in Business Administration (BSBA) Degree Requirements

General Education Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COM 270 [WI]	Business Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
PHIL 105	Critical Reasoning	3.0
PSY 101	General Psychology I	3.0
UNIV B101	The Drexel Experience	1.0
UNIV B201 [WI]	Career Management	1.0
English literature elective ENGL 200 through ENGL 399		3.0
Fine Arts elective		3.0
History (HIST) elective		4.0
Select two of the following:		6.0
BIO 100	Applied Cells, Genetics & Physiology	
or BIO 101	Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
General Education Electives		
Students select seven (21.0 credits) general education electives, with a minimum of one course in each of the following three categories. Students take the remaining 12.0 credits from any of the topics listed under Additional General Education Electives.		
Society and Culture		
Communication, English, Fine Arts, Global Studies, Language or Philosophy		3.0
Social Science		
Anthropology, History, Sociology, Political Science, Psychology		3.0
Science		
Computer Science, Information Systems, Science		3.0
Additional General Education Electives		
Twelve (12.0) credits must be earned by taking 4 courses from the following topics: Communication, English, Fine Arts, Global Studies, Language, Philosophy, Anthropology, History, Sociology, Political Science, Psychology, Computer Science, Information Systems, Math, Science		12.0
Business Requirements		
ACCT 115	Financial Accounting Foundations	4.0
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
BUSN 101	Foundations of Business I (Online students take BUSN 111)	4.0
BUSN 102	Foundations of Business II (Online students take BUSN 112)	4.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
INTB 200	International Business	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
MIS 200	Management Information Systems	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 201	Introduction to Business Statistics	4.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
ORGB 420	Negotiations and Conflict Resolution	
STAT 202	Business Statistics II	
Major Requirements		
Eight required courses (See Major Requirements list below)		32.0
Free Electives		**18.0**
Total Credits		180.0

Required Accounting Major Courses		
ACCT 321	Financial Reporting I	4.0
ACCT 322	Financial Reporting II	4.0
ACCT 323	Financial Reporting III	4.0
ACCT 329	Advanced Accounting	4.0
ACCT 331	Cost Accounting	4.0
ACCT 341	Principles of Auditing	4.0
TAX 341	Individual Income Taxes	4.0

TAX 342	Business Income Taxes	4.0
Total Credits		32.0

A minimum of 20.0 elective (BUSN Non-BUSN) credits are required to fulfill degree completion. Students planning to take the CPA exam should review the educational requirements established by the State Board of Accountancy in the state in which they plan to sit for the examination. Students are qualified to sit for the examination in Pennsylvania by meeting the degree requirements above. Students planning to apply for a CPA license in Pennsylvania have to obtain 225.0 quarter credit hours, the equivalent to 150 semester hours.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BUSN 101	Foundations of Business I	4.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV B101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
BUSN 102	Foundations of Business II	4.0
ECON 202	Principles of Macroeconomics	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	15.0
Term 3		
ACCT 115	Financial Accounting Foundations	4.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0

PSY 101	General Psychology I	3.0
Social science elective		3.0
Society and culture elective		3.0
	Term Credits	17.0
Term 4		
ACCT 116	Managerial Accounting Foundations	4.0
STAT 201	Introduction to Business Statistics	4.0
History (HIST) elective		4.0
Select one of the following:		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
	Term Credits	15.0
Term 5		
BLAW 201	Business Law I	4.0
COM 270 [WI]	Business Communication	3.0
INTB 200	International Business	4.0
Select one of the following:		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
	Term Credits	14.0
Term 6		
ACCT 321	Financial Reporting I	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
ENGL 200 - ENGL 399 course		3.0
	Term Credits	15.0
Term 7		
ACCT 322	Financial Reporting II	4.0
FIN 301	Introduction to Finance	4.0
MIS 200	Management Information Systems	4.0
Science elective		3.0
	Term Credits	15.0
Term 8		
ACCT 323	Financial Reporting III	4.0
ACCT 331	Cost Accounting	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
PHIL 105	Critical Reasoning	3.0
General education elective		3.0
	Term Credits	18.0
Term 9		
ACCT 341	Principles of Auditing	4.0
TAX 341	Individual Income Taxes	4.0
General education elective		3.0
Free electives		4.0
	Term Credits	15.0
Term 10		
ACCT 329	Advanced Accounting	4.0
UNIV B201 [WI]	Career Management	1.0
General education elective		3.0
Free elective		3.0
	Term Credits	11.0
Term 11		
MGMT 450	Strategy and Competitive Advantage	4.0
General education elective		3.0
Free electives		3.0
TAX 342	Business Income Taxes	4.0
	Term Credits	14.0
Term 12		

Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
MGMT 451	Management Simulation	
STAT 202	Business Statistics II	
Free electives		8.0
Fine arts elective		3.0
	Term Credits	15.0

Total Credit: 180.0

Co-op/Career Opportunities

Public, private, and government accounting provide the greatest range of career possibilities. Professional accountants are normally certified as public accountants (CPA) or managerial accountants (CMA) after passing the appropriate professional examinations.

Drexel's co-op program provides an added advantage to accounting students; time spent working in accounting co-op positions is often accepted as part of the one year of accounting experience needed for CPA certification.

Drexel's accounting graduates accept positions in public accounting, private industry, government, and nonprofit organizations. Many also choose to continue their studies in graduate schools, pursuing such degrees as a MBA, master's in taxation, master's in accounting or a PhD. Overall, Drexel's graduates enjoy a high placement rate.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities. To learn more about career opportunities and resources see the Career Guides (http://drexel.edu/scdc/career-services/counseling/career-guides/) provided by the Steinbright Career Development Center.

Facilities

In fall 2013, LeBow College opened its 12-story, Gerri C. LeBow Hall, with a finance trading lab, behavioral studies lab and integrated teaching technology in all classrooms. The new building features two lecture halls, 15 classrooms of varying sizes and seating configurations, including case study rooms and cluster classrooms designed to facilitate group work. Other amenities consist of extensive areas of student spaces, including 19 collaboration rooms, two quiet study areas, and 3,500 square feet of student lounges. Gerri C. LeBow Hall brings together faculty, students and staff, in a state of the art building on the University City campus. Please visit the LeBow College of Business webpage (http://www.lebow.drexel.edu/about/campuses/philadelphia/location/gerri-c-lebow-hall/) to learn more about Gerri C. LeBow Hall.

Accounting Faculty

Stephen B. Bates, DBA *(Wilmington University).* Assistant Clinical Professor.

Maureen Breen, PhD *(West Chester University).* Assistant Clinical Professor. Financial reporting, internal controls in corporate and not-for-profit sectors.

Hsihui Chang, PhD *(University of Minnesota) KPMG Professor of Accounting.*

Hiu Lam Choy, PhD *(University of Rochester).* Associate Professor. Financial accounting.

Mary Copeland, MS, MBA *(American University).* Assistant Clinical Professor.

Anthony P. Curatola, PhD *(Texas A&M University) Joseph F. Ford Professor of Accounting.* Professor. Federal and state income tax policy, retirement income taxation, fringe benefits taxation, educational savings and tax incentives, federal and state income tax research.

Xin Dai, PhD *(University of Minnesota).* Assistant Professor.

Barbara Murray Grein, PhD *(University of North Carolina) Department Head, Accounting and Tax.* Associate Professor. Auditing, auditor selection, audit adjustments, audit fees, corporate governance, financial reporting.

Curtis M. Hall, PhD *(University of Arizona).* Associate Professor. Strategic cost management; corporate governance; capital markets research in accounting; human capital investment.

Natalya V. Khimich, PhD *(University of California at Berkeley).* Assistant Professor. Equity valuation, earnings quality, and accounting for innovation and intangible assets.

Stacy Kline, MBA *(Temple University).* Clinical Professor. Individual, corporation; S corporation and partnership taxation.

Johnny Lee, PhD *(University of Utah).* Associate Clinical Professor. Accounting information systems; e-business; managerial accounting; supply chain management

Gordian Ndubizu, PhD *(Temple University).* Professor. Financial accounting.

Duri Park, PhD *(Ohio State University).* Assistant Professor. Financial accounting, insider trading, investments, and cash holdings.

Jennifer Wright, MTA *(Villanova University) Assistant Department Head, Accounting and Tax.* Associate Clinical Professor.

Business Analytics

Co-Major: Business Analytics
Degree Awarded: Bachelor of Science in Business Administration (BSBA)
Calendar Type: Quarter
Total Credit Hours: 186.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 52.1304
Standard Occupational Classification (SOC) code: 13-2053; 15-2011; 25-1011

The Business Analytics program is a "co-major"

About the Program

How does a company design an effective social media campaign for its brand new product? How does a bank make credit card offers or detect fraud? How does a chain store stock its shelves with just the right products at the right price? Technology has made it possible to collect, store, process and analyze massive data sets that can help businesses make better decisions. However, there remains a gap that can only be filled by those with a background in business analytics. From the junior

analyst providing daily reports on production to the CEO seeking to transform his or her business, all are looking for guidance and talent in business analytics.

LeBow students are uniquely positioned to address descriptive, diagnostic, predictive, prescriptive and pre-emptive questions across the business analytics lifecycle from the corporate generation of data through the application and impact on managerial and leadership decision-making and innovation.

Ranked second in a Computerworld survey on the most difficult skills to find, Business Analytics expertise is not only scarce, but in demand. McKinsey Global Institute reports that the United States could face a shortage of between 140,000 and 190,000 individuals who possess Business Analytics skills and an additional 1.5 million managers with the skills to implement the results.

Example business analytics jobs include, BA Strategy Consultants, Business Intelligence and Performance Management Consultants, Advanced Analytics, Optimization Consultants.

Because students in this co-major are required to choose a major in one of the functional areas of business, the curriculum enables students to tailor the program to their interests and anticipated career path.

Students complete the business analytics co-major in conjunction with one of the following majors:

- Accounting (p. 355)
- Finance (p. 364)
- International Business (p. 408)
- Legal Studies (p. 370)
- Management Information Systems (p. 372)
- Marketing (p. 375)
- Operations & Supply Chain Management (p. 378)
- Sport Business (p. 386)
- Real Estate Management and Development (p. 383)

An additional distinguishing feature of the business analytics co-major is the required senior project (BSAN 460) where students work in small teams on real business analytics projects from LeBow College's corporate partners. The projects require students to bring together all the key elements of the business analytics curriculum to derive business insights for a company's current business challenges. Experiencing this data driven decision-making process is invaluable career preparation.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COM 270 [WI]	Business Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	

MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
PHIL 105	Critical Reasoning	3.0
PSY 101	General Psychology I	3.0
UNIV B101	The Drexel Experience	2.0
English Literature elective		3.0
Fine Arts elective		3.0
History elective		4.0
Science Requirement		**6.0**
Select two courses from the following:		
BIO 100	Applied Cells, Genetics & Physiology	
or BIO 101	Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
General Education electives [*]		21.0
Business Requirements		
ACCT 115	Financial Accounting Foundations	4.0
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
BUSN 101	Foundations of Business I	4.0
BUSN 102	Foundations of Business II	4.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
INTB 200	International Business	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
MIS 200	Management Information Systems	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 201	Introduction to Business Statistics	4.0
STAT 202	Business Statistics II	4.0
Primary Major Courses [**]		**32.0**
Business Analytics Requirements		
BSAN 260	Introduction to Business Analytics	4.0
BSAN 460	Business Analytics Senior Project	4.0
MIS 343	Database Design and Implementation	4.0
Select one of the following:		4.0
BSAN 360	Programming for Data Analytics	
MIS 349	Predictive Business Analytics with Relational Database Data	
Business Analytics Electives		
Select two of the following:		8.0
BSAN 360	Programming for Data Analytics	
ECON 301	Microeconomics	
ECON 350 [WI]	Applied Econometrics	
ECON 360	Time Series Econometrics	
MIS 342	Systems Analysis and Design	
MIS 349	Predictive Business Analytics with Relational Database Data	
MIS 361	Information System Project Management	
MKTG 326	Marketing Insights	
MKTG 366	Customer Analytics	
MKTG 367	Data-Driven Digital Marketing	
OPR 320	Linear Models for Decision Making	
OPR 330	Advanced Decision Making and Simulation	
OPR 340	Decision Models for the Public Sector	
OPR 350	Optimization in Finance	
STAT 331	Introduction to Data Mining for Business	
STAT 335	Introduction to Experimental Design	
Total Credits		186.0

*   Students select seven (21.0 credits) of additional general education electives with a minimum of one course in each of the following categories:
  - Society and Culture (Communication, English, Fine Arts, International Area Studies, Language, Philosophy)
  - Social Science (Anthropology, History, Sociology, Political Science, Psychology)
  - Math and Science (Computer Science, Information Systems, Math, Science)

**   Students completing the Business Analytics co-major must do so in conjunction with a primary business major. Students must select a primary major from the following list:
  - Accounting
  - Real Estate Management and Development
  - Finance
  - Legal Studies
  - Management Information Systems
  - Marketing
  - Operations & Supply Chain Management
  - International Business

*** Occasionally, departments can also offer special topics courses and independent studies on emerging areas of analytics. These courses may be substituted with department chair approval.

†   The following groupings of courses are recommended by departments for their respective career pathways. Students are strongly encouraged to complete three courses for at least one career pathway, based on their other major(s) and career goals.
  Accounting:
  STAT 331: Introduction to Data Mining for Business
  MIS 342: Systems Analysis and Design
  OPR 320: Linear Models for Decision Making
  Economics:
  ECON 301: Microeconomics
  ECON 350 [WI] : Applied Econometrics
  ECON 360: Time Series Econometrics
  STAT 331: Introduction to Data Mining for Business
  MKTG 366: Customer Analytics
  MKTG 367: Data-Driven Digital Marketing
  Complete one of the following two courses:
  BSAN 360: Programming for Business Analytics (R)
  MIS 349: Predictive Analytics (SAS)
  Finance:
  ECON 350 [WI] : Applied Econometrics
  ECON 360: Time Series Econometrics
  STAT 331: Introduction to Data Mining for Business
  OPR 320: Linear Models for Decision Making
  OPR 350: Optimization in Finance
  Management Information Systems:
  MIS 342: Systems Analysis and Design
  MIS 361: Information System Project Management
  Marketing: (Even though only three will be counted toward the BA co-major/minor, we recommend that the students use their primary major or free business electives to complete all of the courses below in order to develop a solid foundation. Note that MKTG 366 and STAT 331 employ similar techniques and MKTG 367 and STAT 335 employ similar techniques.)
  MKTG 326: Marketing Insights
  MKTG 366: Customer Analytics
  MKTG 367: Data-Driven Digital Marketing
  STAT 331: Data Mining
  STAT 335: Introduction to Experimental Design

Operations and Supply Chain Management:
ECON 350 [WI] : Applied Econometrics
ECON 360: Time Series Econometrics
STAT 331: Introduction to Data Mining for Business
STAT 335: Introduction to Experimental Design
MIS 342: Systems Analysis and Design
OPR 320: Linear Models for Decision Making
OPR 330: Advanced Decision Making and Simulation
OPR 340: Decision Models for the Public Sector
MKTG 366: Customer Analytics
MKTG 367: Data-Driven Digital Marketing

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BUSN 101	Foundations of Business I	4.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV B101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
BUSN 102	Foundations of Business II	4.0
ECON 202	Principles of Macroeconomics	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	15.0
Term 3		
ACCT 115	Financial Accounting Foundations	4.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0

PSY 101	General Psychology I	3.0
Select one of the following:		3.0
BIO 100	Applied Cells, Genetics & Physiology	
or 101	Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
General Education elective		3.0
	Term Credits	17.0
Term 4		
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
COM 270 [WI]	Business Communication	3.0
STAT 201	Introduction to Business Statistics	4.0
	Term Credits	15.0
Term 5		
INTB 200	International Business	4.0
MIS 200	Management Information Systems	4.0
STAT 202	Business Statistics II	4.0
Select one of the following:		3.0
BIO 101	Applied Biological Diversity, Ecology & Evolution	
or 100	Applied Cells, Genetics & Physiology	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
	Term Credits	15.0
Term 6		
Any 200-399 English (ENGL) course		3.0
FIN 301	Introduction to Finance	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
	Term Credits	15.0
Term 7		
BSAN 260	Introduction to Business Analytics	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
PHIL 105	Critical Reasoning	3.0
Primary Major Course*		4.0
	Term Credits	15.0
Term 8		
History elective		4.0
Primary Major Course*		4.0
Science elective		3.0
Pick one of the following:		4.0
BSAN 360	Programming for Data Analytics	
MIS 349	Predictive Business Analytics with Relational Database Data	
	Term Credits	15.0
Term 9		
MIS 343	Database Design and Implementation	4.0
Society and Culture elective		3.0
Primary Major Courses*		8.0
	Term Credits	15.0
Term 10		
UNIV B201 [WI]	Career Management	1.0
Primary Major Course*		4.0
Business Analytics Elective		4.0
Fine Arts elective		3.0
General education elective		3.0
	Term Credits	15.0
Term 11		
MGMT 450	Strategy and Competitive Advantage	4.0
Primary Major courses*		8.0
Business Analytics Elective		4.0
	Term Credits	16.0
Term 12		

BSAN 460	Business Analytics Senior Project	4.0
Primary Major course*		4.0
Social Science elective		3.0
General education elective		6.0
	Term Credits	17.0

Total Credit: 186.0

*   See degree requirements (p. 358) for a list of business majors that may be completed in conjunction with the business analytics major.

Co-Op/Career Opportunities

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Facilities

In fall 2013, LeBow College opened its 12-story, Gerri C. LeBow Hall, with a finance trading lab, behavioral studies lab and integrated teaching technology in all classrooms. The new building features two lecture halls, 15 classrooms of varying sizes and seating configurations, including case study rooms and cluster classrooms designed to facilitate group work. Other amenities consist of extensive areas of student spaces, including 19 collaboration rooms, two quiet study areas, and 3,500 square feet of student lounges. Gerri C. LeBow Hall brings together faculty, students and staff, in a state of the art building on the University City campus. Please visit the LeBow College of Business webpage (http://www.lebow.drexel.edu/about/campuses/philadelphia/location/gerri-c-lebow-hall/) to learn more about Gerri C. LeBow Hall.

Business Analytics Faculty

Murugan Anandarajan, PhD *(Drexel University) Interim Associate Dean for Academic Affairs.* Professor. Cyber crime, strategic management of information technology, unstructured data mining, individual internet usage behavior (specifically abuse and addiction), application of artificial intelligence techniques in forensic accounting and ophthalmology.

Orakwue B. Arinze, PhD *(London School of Economics).* Professor. Client/Server computing; Enterprise Application Software (EAS)/Enterprise Resource Planning Software (ERP); knowledge-based and decision support applications in operations management.

Hande Benson, PhD *(Princeton University).* Professor. Interior-point methods, Large Scale Optimization, Mathematical Programming, Nonlinear Optimization, Operations and Supply Chain Optimization, Optimization Software, Portfolio Optimization

Qizhi Dai, PhD *(University of Minnesota).* Associate Professor. Business Value of Information Technology, eCommerce, Economics of Information Technology, Information System Management.

Michaela Draganska, PhD *(Kellogg School of Management, Northwestern University) Department of Marketing.* Associate Professor. Advertising strategy, product assortment decisions, new product positioning, distribution channels. Marketing analytics and big data, marketing communications, marketing research, marketing strategy, technology and innovation.

Elea Feit, PhD *(University of Michigan) Department of Marketing.* Assistant Professor. Bayesian hierarchical models, interactive (eCommerce), marketing research, missing data.

Christopher Gaffney, PhD *(Rutgers University, New Brunswick).* Assistant Clinical Professor. Applied Probability, Decision Theory, Risk Analysis

David Gefen, PhD *(Georgia State University) Provost Distinguished Research Professor.* Professor. Strategic IT management; IT development and implementation management; research methodology; managing the adoption of large IT systems, such as MRP II, ERP, and expert systems; research methodology, eCommerce; Online Auctions; Outsourcing; SAS; Technology Adoption.

Jinwook Lee, PhD *(Rutgers University, New Brunswick).* Assistant Professor. Decision Models, Mathematical Programming, Risk Assessment Stochastic Optimization, Stochastic Processes.

Merrill W. Liechty, PhD *(Duke University).* Clinical Professor. Bayesian statistics, portfolio selection, higher moment estimation, higher moment estimation, Markov Chain Monte Carlo

Bruce D. McCullough, PhD *(University of Texas Austin).* Professor. Applied Econometrics, Data Mining, Econometric Techniques, Reliability of Statistical and Econometric Software.

Samir Shah, DPS *(Pace University).* Clinical Professor. Drexel University's Provost Fellow India Partnerships

Chaojiang Wu, PhD *(University of Cincinnnati).* Assistant Professor. Computational Statistics, Data Analytics, Data Mining, Decision Models, Predictive Analytics

Business and Engineering

Major: Business and Engineering
Degree Awarded: Bachelor of Science in Business and Engineering (BSBAE)
Calendar: Quarter
Total Credit Hours: 183.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 52.1301
Standard Occupational Classification (SOC) code: 11-1021

About the Program

The major in business and engineering combines two of Drexel's most exciting programs, linking business and engineering to provide students with expertise in both fields.

The program contains a curriculum combining coursework in both business and engineering, enabling graduates to work successfully in technically oriented business positions. Students complete a set of broad functional business core courses along with a firm foundation in science, mathematics, and engineering. Students also study quantitative decision making within a business context, technology innovation management, and operations management. They complete a minor in business as well as a concentration in engineering. Graduates of this program will be well prepared to participate in innovative technological efforts in business.

The major gives students the opportunity to learn important concepts in functional business areas such as accounting, economics, finance, information systems, law, marketing, organizational behavior, operations, and statistics.

Mission

The Bachelor of Science in Business and Engineering program provides students the opportunity to:

- Learn important concepts in functional business areas such as accounting, economics, finance, information systems, law, marketing, organizational behavior, operations, and statistics.
- Study in more depth the areas of operations, technology innovation management, and other functional business areas.
- Complete a course of study in an engineering discipline after completing a firm foundation in science and mathematics.
- Develop skills in technical communication and critical reasoning.
- Study ethical issues faced by managers and engineers, and understand technology from a historical perspective.
- Apply acquired skills in co-op work experiences to further enhance their knowledge base.
- Study entrepreneurship from a management and finance perspective for preparation in innovative technological efforts.
- Learn to improve the functioning of technically oriented businesses through operational competencies.

About the Business Minors

All Business and Engineering students are required to complete a business minor under the curriculum, and they will have the ability to choose from any of the business minors that are currently offered by the LeBow College of Business.

- Accounting
- Business Analytics
- Business Consulting
- Economics
- Finance
- International Economics (p. 415)
- Legal Studies (p. 394)
- Management Information Systems (p. 394)
- Marketing (p. 394)
- Operations & Supply Chain Management (p. 395)
- Organizational Management (p. 395)
- Sport Management (p. 396)
- Technology Innovation Management (p. 397)

About the Engineering Concentrations

All Business and Engineering students are required to complete an engineering concentration under the curriculum, and they will have the ability to choose from the following:

- Chemical Engineering
- Civil Engineering
- Electrical and Computer Engineering
- Mechanical Engineering
- General Engineering

For more information on the specific courses for the concentration, please refer to the Degree Requirements Page (p. 362).

Additional Information

For additional information about the program or to schedule an appointment, please contact the Department of Decision Sciences and MIS (https://www.lebow.drexel.edu/faculty-and-research/disciplines/decision-sciences-and-mis/).

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COM 310 [WI]	Technical Communication (WI)	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
ENGR 231	Linear Engineering Systems	3.0
ENGR 232	Dynamic Engineering Systems	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 200	Multivariate Calculus	4.0
PHIL 105	Critical Reasoning	3.0
Select one of the following:		3.0
HIST 285	Technology in Historical Perspective	
PHIL 301	Business Ethics	
PHIL 315	Engineering Ethics	
UNIV B101	The Drexel Experience	1.0
UNIV B201 [WI]	Career Management	1.0

Science and Computing Requirements

CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0

Business Requirements

ACCT 115	Financial Accounting Foundations	4.0
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
BUSN 101	Foundations of Business I	4.0
BUSN 102	Foundations of Business II	4.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
INTB 200	International Business	4.0
MGMT 201	Introduction to Technology Innovation Management	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
MIS 200	Management Information Systems	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 321	Planning and Control of Operations	4.0
ORGB 300 [WI]	Organizational Behavior (WI)	4.0
STAT 205	Statistical Inference I	4.0
STAT 206	Statistical Inference II	4.0

Business and Engineering Focus

Quantitative Decision Making in Business

OPR 320	Linear Models for Decision Making	4.0
Select one of the following:		4.0

MKTG 366	Customer Analytics	
MKTG 367	Data-Driven Digital Marketing	
OPR 330	Advanced Decision Making and Simulation	
STAT 325	Six-Sigma Quality Implementation	
STAT 331	Introduction to Data Mining for Business	

Technology Innovation Management

Select one of the following:		4.0
MGMT 301	Designing Innovative Organizations	
MGMT 302	Competing in Technology Industries	
MGMT 364	Technology Management	

Operations Management

Select one of the following:		4.0
MIS 361	Information System Project Management	
OPM 315	Service Operations Management	
OPM 325	Advanced Planning and Control of Operations	

Engineering Requirements

ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
ENGR 113	First-Year Engineering Design	3.0
ENGR 131	Introductory Programming for Engineers	3.0
ENGR 220	Fundamentals of Materials	4.0
Business Minor *		**16.0**
Engineering Concentration **		**15.0**
Total Credits		183.0

*   Students must take 4-5 LeBow courses to complete the requirements of a business minor. Students must select a minor from the following list:
- Accounting
- Economics
- Entrepreneurship
- Finance
- International Economics
- Legal Studies
- Management Information Systems
- Marketing
- Operations & Supply Chain Management
- Technology Innovation Management

**   Students must select an engineering concentration and complete all five courses required for it:
- Electrical and Computer Engineering: ECE 105, ECE 200, ECE 201, ECE 303, ECES 301
- Mechanical Engineering: MEM 202, (MEM 230 and MEM 238 and MEM 330 and MEM 333) or (ENGR 210 and MEM 220 and MEM 310 and MEM 345) or (MEM 238 and MEM 255 and MEM 345 and MEM 355) or (MEM 201 and MEM 230 and MEM 238 and MEM 333)

- Civil Engineering: ENGR 210, CAEE 202, CAEE 203,CAEE 212, MEM 202
- Chemical Engineering: ENGR 210 or CHE 330, CHE 211, CHE 212, CHE 230,CHE 220
- General Engineering: Any 5 courses from those listed for the above concentrations

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BUSN 101	Foundations of Business I	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
MATH 121	Calculus I	4.0
UNIV B101	The Drexel Experience	1.0
	Term Credits	15.0
Term 2		
BUSN 102	Foundations of Business II	4.0
CHEM 101	General Chemistry I	3.5
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
ENGR 131	Introductory Programming for Engineers	3.0
MATH 122	Calculus II	4.0
	Term Credits	17.5
Term 3		
CHEM 102	General Chemistry II	4.5
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
ENGR 113	First-Year Engineering Design	3.0
MATH 200	Multivariate Calculus	4.0
MGMT 201	Introduction to Technology Innovation Management	4.0
	Term Credits	18.5
Term 4		
ACCT 115	Financial Accounting Foundations	4.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 231	Linear Engineering Systems	3.0
PHYS 101	Fundamentals of Physics I	4.0
STAT 205	Statistical Inference I	4.0
	Term Credits	16.0
Term 5		
ACCT 116	Managerial Accounting Foundations	4.0
ENGR 232	Dynamic Engineering Systems	3.0
PHYS 102	Fundamentals of Physics II	4.0
STAT 206	Statistical Inference II	4.0
	Term Credits	15.0
Term 6		
ECON 201	Principles of Microeconomics	4.0
ENGR 220	Fundamentals of Materials	4.0
MIS 200	Management Information Systems	4.0

OPM 321	Planning and Control of Operations	4.0
	Term Credits	16.0
Term 7		
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPR 320	Linear Models for Decision Making	4.0
	Term Credits	16.0
Term 8		
ORGB 300 [WI]	Organizational Behavior	4.0
INTB 200	International Business	4.0
Business Minor Elective		4.0
Engineering Concentration*		3.0
	Term Credits	15.0
Term 9		
BLAW 201	Business Law I	4.0
COM 310 [WI]	Technical Communication	3.0
Engineering Concentration*		3.0
Business Minor Elective		4.0
	Term Credits	14.0
Term 10		
PHIL 105	Critical Reasoning	3.0
Select one of the following:		4.0
MKTG 366	Customer Analytics	
MKTG 367	Data-Driven Digital Marketing	
OPR 330	Advanced Decision Making and Simulation	
STAT 325	Six-Sigma Quality Implementation	
STAT 331	Introduction to Data Mining for Business	
Engineering Concentration*		3.0
Business Minor*		4.0
	Term Credits	14.0
Term 11		
Select one of the following:		4.0
MGMT 301	Designing Innovative Organizations	
MGMT 302	Competing in Technology Industries	
MGMT 364	Technology Management	
MIS 250	Introduction to Enterprise Application Software Using SAP - Logistics	
Select one of the following:		4.0
MIS 361	Information System Project Management	
OPM 315	Service Operations Management	
OPM 325	Advanced Planning and Control of Operations	
Engineering Concentration*		3.0
Business Minor*		4.0
	Term Credits	15.0
Term 12		
UNIV B201 [WI]	Career Management	1.0
MGMT 450	Strategy and Competitive Advantage	4.0
Select one of the following:		3.0
HIST 285	Technology in Historical Perspective	
PHIL 315	Engineering Ethics	
PHIL 301	Business Ethics	
Engineering Concentration		3.0
	Term Credits	11.0

Total Credit: 183.0

*   See degree requirements (p. 362).

Facilities

In fall 2013, LeBow College opened its 12-story, Gerri C. LeBow Hall, with a finance trading lab, behavioral studies lab and integrated teaching

technology in all classrooms. The new building features two lecture halls, 15 classrooms of varying sizes and seating configurations, including case study rooms and cluster classrooms designed to facilitate group work. Other amenities consist of extensive areas of student spaces, including 19 collaboration rooms, two quiet study areas, and 3,500 square feet of student lounges. Gerri C. LeBow Hall brings together faculty, students and staff, in a state of the art building on the University City campus. Please visit the LeBow College of Business webpage (http://www.lebow.drexel.edu/about/campuses/philadelphia/location/gerri-c-lebow-hall/) to learn more about Gerri C. LeBow Hall.

Co-Op/Career Opportunities

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities. To learn more about career opportunities and resources see the Career Guides (http://drexel.edu/scdc/career-services/counseling/career-guides/) provided by the Steinbright Career Development Center.

Decision Sciences & MIS Faculty

Murugan Anandarajan, PhD *(Drexel University) Interim Associate Dean for Academic Affairs.* Professor. Cyber crime, strategic management of information technology, unstructured data mining, individual internet usage behavior (specifically abuse and addiction), application of artificial intelligence techniques in forensic accounting and ophthalmology.

Orakwue B. Arinze, PhD *(London School of Economics).* Professor. Client/Server computing; Enterprise Application Software (EAS)/Enterprise Resource Planning Software (ERP); knowledge-based and decision support applications in operations management.

Avijit Banerjee, PhD *(The Ohio State University) Department of Decision Sciences.* Professor. Interface with Marketing, Pricing Revenue Management, Inventory Control, Operations Planning and Scheduling, Production Planning and Control, Supply Chain Management

Hande Benson, PhD *(Princeton University).* Professor. Interior-point methods, Large Scale Optimization, Mathematical Programming, Nonlinear Optimization, Operations and Supply Chain Optimization, Optimization Software, Portfolio Optimization

Qizhi Dai, PhD *(University of Minnesota).* Associate Professor. Business Value of Information Technology, eCommerce, Economics of Information Technology, Information System Management.

Christopher Gaffney, PhD *(Rutgers University, New Brunswick).* Assistant Clinical Professor. Applied Probability, Decision Theory, Risk Analysis

David Gefen, PhD *(Georgia State University) Provost Distinguished Research Professor.* Professor. Strategic IT management; IT development and implementation management; research methodology; managing the adoption of large IT systems, such as MRP II, ERP, and expert systems; research methodology, eCommerce; Online Auctions; Outsourcing; SAS; Technology Adoption.

Seung-Lae Kim, PhD *(Penn State University) Department of Decision Sciences.* Professor. Inventory control, Production Planning and Control, Quality Management, Six-Sigma, Supply Chain Management

Jinwook Lee, PhD *(Rutgers University, New Brunswick).* Assistant Professor. Decision Models, Mathematical Programming, Risk Assessment Stochastic Optimization, Stochastic Processes.

Jeongsik Lee, PhD *(University of California Los Angeles).* Assistant Professor. Economics of Innovation; Social networks; Technology management

Benjamin Lev, PhD *(Case Western Reserve University).* Trustee Professor. Inventory Control, Mathematical Programming, Operations Planning and Scheduling.

Merrill W. Liechty, PhD *(Duke University).* Clinical Professor. Bayesian statistics, portfolio selection, higher moment estimation, higher moment estimation, Markov Chain Monte Carlo

Hazem Maragah, PhD *(Louisiana University) Department of Decision Sciences.* Associate Professor. Statistical quality control, total equity management, applied statistics.

Bruce D. McCullough, PhD *(University of Texas Austin).* Professor. Applied Econometrics, Data Mining, Econometric Techniques, Reliability of Statistical and Econometric Software.

Fariborz Y. Partovi, PhD *(The Wharton School, University of Pennsylvania) Department of Decision Sciences.* Professor. Manufacturing Technology Development, Quality Implementation, Quality Management, Service Management, Six-Sigma

Matthew Reindorp, PhD *(University of Maryland College Park) Interim Department Head, Decision Sciences & MIS.* Associate Clinical Professor. Real Options, Simulation, Stochastic Processes, Supply Chain Finance, Supply Chain Management

Samir Shah, DPS *(Pace University).* Clinical Professor. Drexel University's Provost Fellow India Partnerships

Wenjing Shen, PhD *(University of Michigan) Department of Decision Sciences.* Associate Professor. The interface of operations management and marketing; inventory management; supply chain management.

Min Wang, PhD *(Columbia University) Department of Decision Sciences.* Associate Clinical Professor. Healthcare Operations Management, Inventory Control, Production Planning and Control, Service Management, Supply Chain Management

Chaojiang Wu, PhD *(University of Cincinnnati).* Assistant Professor. Computational Statistics, Data Analytics, Data Mining, Decision Models, Predictive Analytics

Finance

Major: Finance
Degree Awarded: Bachelor of Science in Business Administration (BSBA)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 52.1399
Standard Occupational Classification (SOC) code: 11-3031;13-2011; 13-2031; 13-2051

About the Program

Students with a major in finance obtain a thorough understanding of the basic concepts, principles, operating procedures, and analytical techniques in the various areas of finance. Throughout the finance

curriculum, students develop and apply quantitative skills for financial decision making within the business environment.

This major prepares students for careers in private business firms, including positions involving forecasting and budgeting for financial resources, cost-effectiveness analysis, control of expenditures, evaluation and financing of new projects, and evaluation of alternative methods of financing. In the investment field, opportunities include positions in security analysis, sales and trading, and investment banking. In the public sector, opportunities include positions at the federal, state, and local government levels.

For more information about the program, contact the Department of Finance (http://www.lebow.drexel.edu/faculty-and-research/disciplines/finance/).

Major Requirements

All core mathematics and statistics courses should be completed before embarking on the upper-level finance major courses. A second course in business statistics, STAT 202 with a minimum grade of C, must be completed as a prerequisite for the major's required courses.

Because of the relevance of financial accounting to the field of finance, it is strongly recommended that finance students also complete ACCT 321 and ACCT 322 (*Financial Reporting I and II*) as two of their free electives.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Bachelor of Science in Business Administration (BSBA) Degree Requirements

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COM 270 [WI]	Business Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
PHIL 105	Critical Reasoning	3.0
PSY 101	General Psychology I	3.0
UNIV B101	The Drexel Experience	1.0
UNIV B201 [WI]	Career Management	1.0
English literature elective ENGL 200 through ENGL 399		3.0
Fine Arts elective		3.0
History (HIST) elective		4.0
Select two of the following:		6.0
BIO 100	Applied Cells, Genetics & Physiology	
or BIO 101	Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	

General Education Electives

Students select seven (21.0 credits) general education electives, with a minimum of one course in each of the following three categories. Students take the remaining 12.0 credits from any of the topics listed under Additional General Education Electives.

Society and Culture

Communication, English, Fine Arts, Global Studies, Language or Philosophy	3.0
Social Science	
Anthropology, History, Sociology, Political Science, Psychology	3.0
Science	
Computer Science, Information Systems, Science	3.0

Additional General Education Electives

Twelve (12.0) credits must be earned by taking 4 courses from the following topics: Communication, English, Fine Arts, Global Studies, Language, Philosophy, Anthropology, History, Sociology, Political Science, Psychology, Computer Science, Information Systems, Math, Science	12.0

Business Requirements

ACCT 115	Financial Accounting Foundations	4.0
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
BUSN 101	Foundations of Business I (Online students take BUSN 111)	4.0
BUSN 102	Foundations of Business II (Online students take BUSN 112)	4.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
INTB 200	International Business	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
MIS 200	Management Information Systems	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 201	Introduction to Business Statistics	4.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
ORGB 420	Negotiations and Conflict Resolution	
STAT 202	Business Statistics II	

Major requirements

Eight required courses (See Major Requirements list below)	32.0
Free Electives	**18.0**
Total Credits	180.0

Required Finance Major Courses

FIN 302	Intermediate Corporate Finance	4.0
FIN 321	Investment Securities & Markets	4.0
FIN 325	Financial Institutions and Markets	4.0
Select five of the following:		20.0
FIN 323	Risk Management	
FIN 330	Derivative Securities	
FIN 332	Investment Analysis	
FIN 335	Entrepreneurial Finance	
FIN 338	Money and Capital Markets	
FIN 340	Seminar in Finance	
FIN 341	Applied Portfolio Management	
FIN 342	Advanced Portfolio Management	
FIN 345	Mergers & Acquisitions	
FIN 346	Global Financial Management	
FIN 348	Corporate Financial Reporting to Executives	
FIN 440	Credit Risk Analysis	
FIN 450	Personal Wealth Management	
FIN T480	Special Topics in FIN	
REMD 375	Real Estate Finance	
REMD 410	Real Estate Investment and Asset Management	
SMT 375	Sport Finance	
Total Credits		32.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

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Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BUSN 101	Foundations of Business I	4.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV B101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
BUSN 102	Foundations of Business II	4.0
CIVC 101	Introduction to Civic Engagement	1.0
ECON 202	Principles of Macroeconomics	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	16.0
Term 3		
ACCT 115	Financial Accounting Foundations	4.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PSY 101	General Psychology I	3.0
Society and culture course[*]		3.0
General Education elective[*]		3.0
	Term Credits	16.0
Term 4		
ACCT 116	Managerial Accounting Foundations	4.0
STAT 201	Introduction to Business Statistics	4.0
History (HIST) elective		4.0
Select one of the following:		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	

	PHYS 151	Applied Physics	
		Term Credits	15.0
Term 5			
BLAW 201	Business Law I		4.0
COM 270 [WI]	Business Communication		3.0
STAT 202	Business Statistics II		4.0
Select one of the following:			3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution		
CHEM 151	Applied Chemistry		
PHYS 151	Applied Physics		
		Term Credits	14.0
Term 6			
FIN 301	Introduction to Finance		4.0
MKTG 201	Introduction to Marketing Management		4.0
ORGB 300 [WI]	Organizational Behavior		4.0
Social Science Elective			3.0
		Term Credits	15.0
Term 7			
FIN 302	Intermediate Corporate Finance		4.0
MIS 200	Management Information Systems		4.0
OPM 200	Operations Management		4.0
Science Elective[*]			3.0
		Term Credits	15.0
Term 8			
FIN 321	Investment Securities & Markets		4.0
PHIL 105	Critical Reasoning		3.0
Free Electives			6.0
		Term Credits	13.0
Term 9			
FIN 325	Financial Institutions and Markets		4.0
INTB 200	International Business		4.0
Free Elective			4.0
General Education Elective[*]			3.0
		Term Credits	15.0
Term 10			
FIN Major Courses (see major requirements for list)			8.0
Free Electives			4.0
General Education Elective[*]			3.0
		Term Credits	15.0
Term 11			
UNIV B201 [WI]	Career Management		1.0
FIN Major Courses (see major requirements for list)			8.0
ENGL 200 Through ENGL 399			3.0
Fine Arts Elective			3.0
		Term Credits	15.0
Term 12			
MGMT 450	Strategy and Competitive Advantage		4.0
FIN Major Course (see major requirements for list)			4.0
Free Elective			4.0
General Education Elective[*]			3.0
		Term Credits	15.0

Total Credit: 180.0

[*]   See degree requirements (p. 365).

Writing-Intensive Course Requirements

sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Co-op/Career Opportunities

The finance program at Drexel prepares students for careers in corporate financial management, the investment field, and the public sector. It also provides excellent basic preparation for various types of professional certification, including chartered financial analyst (CFA) and certified financial planner (CFP). In money and capital markets, finance students often find careers in banking, securities analysis, and portfolio management. In government, many choose to work for regulatory agencies.

Typical positions include financial analyst, capital budgeting officer, credit analyst, merger and acquisition manager, bank trust officer, portfolio analyst, and personal wealth manager.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) for more detailed information on co-op and post-graduate opportunities. Also visit the Career Guides (http://drexel.edu/scdc/career-services/counseling/career-guides/) provided by the Steinbright Career Development Center.

Facilities

In fall 2013, LeBow College opened its 12-story, Gerri C. LeBow Hall, with a finance trading lab, behavioral studies lab and integrated teaching technology in all classrooms. The new building features two lecture halls, 15 classrooms of varying sizes and seating configurations, including case study rooms and cluster classrooms designed to facilitate group work. Other amenities consist of extensive areas of student spaces, including 19 collaboration rooms, two quiet study areas, and 3,500 square feet of student lounges. Gerri C. LeBow Hall brings together faculty, students and staff, in a state of the art building on the University City campus. Please visit the LeBow College of Business webpage (http://www.lebow.drexel.edu/about/campuses/philadelphia/location/gerri-c-lebow-hall/) to learn more about Gerri C. LeBow Hall.

Finance Faculty

David A. Becher, PhD *(Pennsylvania State University) Department of Finance*. Professor. Mergers and acquisitions, corporate governance, financial institutions.

Jie Cai, PhD *(University of Iowa) Department of Finance*. Associate Professor. Investment banking, mergers and acquisitions, corporate finance and corporate governance.

Thomas Chi-Nan Chiang, PhD *(The Pennsylvania State University) Marshall M. Austin Professor of Finance*. Professor. International finance; time series analysis of financial data; econometric modeling & forecasting; financial markets; international risk management; monetary theory; macroeconomics; emerging markets; and global country funds.

Naveen Daniel, PhD *(Arizona State University)*. Associate Professor. Corporate governance, mutual funds, hedge funds.

Daniel Dorn, PhD *(Columbia University) Department of Finance*. Associate Professor. Capital markets and investments; behavioral finance.

Eliezer M. Fich, PhD *(New York University) Department of Finance*. Professor. Empirical topics in corporate finance.

Michael Gombola, PhD *(University of South Carolina) Department Chair, Finance*. Professor. Stock offerings and repurchases, mergers, acquisitions, and restructuring; working capital management, time series analysis; options and derivatives, financial statement analysis.

Joseph Kalmenovitz, PhD *(New York University)*. Assistant Professor. Financial regulation; corporate finance; law and economics; labor.

Amy Kratchman, MBA *(Drexel University)*. Associate Clinical Professor. Investments; Portfolio Management

Michelle Lowry, PhD *(University of Rochester) TD Bank Endowed Professor*. Professor. Empirical corporate finance, including initial public offerings, mergers, and corporate governance

Edward Nelling, PhD, CFA *(University of Pennsylvania-Wharton) Department Head*. Professor. Investments; corporate finance; real estate finance.

Gregory Nini, PhD *(The Wharton School, University of Pennsylvania)*. Assistant Professor. Creditor control rights, corporate governance, and firm value; insurance economics.

Patricia Robak, PhD *(Lehigh University) Department of Finance*. Clinical Professor. Investments, money and banking, international finance.

Diana Sandberg, MS *(Drexel University)*. Associate Clinical Professor. Portfolio management, derivatives, investment management.

Bradford Sodowick, MBA, MD *(University of Pennsylvania)*. Assistant Clinical Professor. Corporate finance, healthcare finance.

Samuel H. Szewczyk, PhD *(Pennsylvania State University)*. Associate Professor. Corporate governance, mergers and acquisitions, financial engineering, investment banking, financial institutions.

George Tsetsekos, PhD *(The University of Tennessee) Dean Emeritus, LeBow College of Business; Francis Professor of Finance*. Professor. Valuation and corporate restructuring, treasury and risk/hedging operations, investment banking, securitization, emerging capital markets, multinational finance, bank asset-liability management.

Emeritus Faculty

Ralph Walkling, PhD *(University of Maryland) Stratakis Professor of Corporate Governance, Department of Finance*. Professor Emeritus. Corporate governance, mergers and acquisitions.

General Business

Major: General Business
Degree Awarded: Bachelor of Science in Business Administration (BSBA)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 52.0201
Standard Occupational Classification (SOC) code: 11-1021; 11-2022; 11-3011; 11-9199

About the Program

The major in general business equips students with a thorough understanding of theory and practice in the fundamental areas of business such as accounting, economics, finance, management, and marketing. This major is intended for business students who wish to gain breadth within their undergraduate studies. Students will develop the skills and competencies necessary for success across a diverse spectrum of business organizations.

Students selecting the major in general business should choose eight courses from at least five of the following fields: accounting (ACCT (p. 751)), economics (ECON (p. 880)), finance (FIN (p. 947)), human resource management (HRMT (p. 992)), international business (INTB (p. 1005)), legal studies (BLAW (p. 1013)), management (MGMT (p. 1014)), marketing (MKTG (p. 1020)), management information systems (MIS (p. 1016)), business statistics (STAT (p. 824)), organizational behavior (ORGB (p. 1067)), operations research (OPR (p. 1066)), operations management (OPM (p. 1065)), real estate management and development (REMD (p. 383)) and sport business (SPBS (p. 1120)).

Please note that students pursuing this degree option are not eligible to obtain a business co-major or business minor.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Bachelor of Science in Business Administration (BSBA) Degree Requirements

General Education Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COM 270 [WI]	Business Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
PHIL 105	Critical Reasoning	3.0
PSY 101	General Psychology I	3.0
UNIV B101	The Drexel Experience	1.0
UNIV B201 [WI]	Career Management	1.0
English literature elective ENGL 200 through ENGL 399		3.0
Fine Arts elective		3.0
History (HIST) elective		4.0
Select two of the following:		6.0
BIO 100	Applied Cells, Genetics & Physiology	
or BIO 101	Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	

General Education Electives

Students select seven (21.0 credits) general education electives, with a minimum of one course in each of the following three categories. Students take the remaining 12.0 credits from any of the topics listed under Additional General Education Electives.

Society and Culture		
Communication, English, Fine Arts, Global Studies, Language or Philosophy		3.0
Social Science		
Anthropology, History, Sociology, Political Science, Psychology		3.0
Science		
Computer Science, Information Systems, Science		3.0

Additional General Education Electives

Twelve (12.0) credits must be earned by taking 4 courses from the following topics: Communication, English, Fine Arts, Global Studies, Language, Philosophy, Anthropology, History, Sociology, Political Science, Psychology, Computer Science, Information Systems, Math, Science	12.0

Business Requirements

ACCT 115	Financial Accounting Foundations	4.0
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
BUSN 101	Foundations of Business I (Online students take BUSN 111)	4.0
BUSN 102	Foundations of Business II (Online students take BUSN 112)	4.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
INTB 200	International Business	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
MIS 200	Management Information Systems	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 201	Introduction to Business Statistics	4.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
ORGB 420	Negotiations and Conflict Resolution	
STAT 202	Business Statistics II	

Major Requirements

Eight required courses (See Major Requirements list below)		32.0
Free Electives		**18.0**
Total Credits		180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing

Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BUSN 101	Foundations of Business I	4.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV B101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
BUSN 102	Foundations of Business II	4.0
ECON 202	Principles of Macroeconomics	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	15.0
Term 3		
ACCT 115	Financial Accounting Foundations	4.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PSY 101	General Psychology I	3.0
Select one of the following:		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
General education elective		3.0
	Term Credits	16.0
Term 4		
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
COM 270 [WI]	Business Communication	3.0
STAT 201	Introduction to Business Statistics	4.0
	Term Credits	15.0
Term 5		
INTB 200	International Business	4.0
MIS 200	Management Information Systems	4.0
Select One of the Following		4.0
BUSN 451	Business Consulting	
MGMT 260	Introduction to Entrepreneurship	
MGMT 451	Management Simulation	
STAT 202	Business Statistics II	
Select one of the following:		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
	Term Credits	15.0

Term 6		
FIN 301	Introduction to Finance	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
English Literature elective (ENGL 200 - 399)		3.0
	Term Credits	15.0
Term 7		
Major Elective 1		4.0
Major Elective 2		4.0
PHIL 105	Critical Reasoning	3.0
ORGB 300 [WI]	Organizational Behavior	4.0
	Term Credits	15.0
Term 8		
Major Elective 3		4.0
Major Elective 4		4.0
Fine Arts elective		3.0
History (HIST) elective		3.0
Science Elective		3.0
	Term Credits	17.0
Term 9		
Major Elective 5		4.0
Major Electives 6		4.0
Social Science elective		3.0
Society and Culture elective		3.0
	Term Credits	14.0
Term 10		
Major Elective 7		4.0
UNIV B201 [WI]	Career Management	1.0
Free electives		7.0
General Education elective		3.0
	Term Credits	15.0
Term 11		
MGMT 450	Strategy and Competitive Advantage	4.0
Major Elective 8		4.0
General Education elective		3.0
Free elective		3.0
	Term Credits	14.0
Term 12		
General Education		3.0
Free Electives		10.0
	Term Credits	13.0

Total Credit: 180.0

Facilities

In fall 2013, LeBow College opened its 12-story, Gerri C. LeBow Hall, with a finance trading lab, behavioral studies lab and integrated teaching technology in all classrooms. The new building features two lecture halls, 15 classrooms of varying sizes and seating configurations, including case study rooms and cluster classrooms designed to facilitate group work. Other amenities consist of extensive areas of student spaces, including 19 collaboration rooms, two quiet study areas, and 3,500 square feet of student lounges. Gerri C. LeBow Hall brings together faculty, students and staff, in a state of the art building on the University City campus. Please visit the LeBow College of Business webpage (http://www.lebow.drexel.edu/about/campuses/philadelphia/location/gerri-c-lebow-hall/) to learn more about Gerri C. LeBow Hall.

Co-Op/Career Opportunities

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and

post-graduate opportunities. To learn more about career opportunities and resources see the Career Guides (http://drexel.edu/scdc/career-services/counseling/career-guides/) provided by the Steinbright Career Development Center.

General Business Faculty

Beth Buckman, MBA *(Drexel University)*. Assistant Clinical Professor. Unique needs of transfer student research

Jodi Cataline, MBA *(University of Delaware)*. Associate Clinical Professor. Research on financial literacy

Dana D'Angelo, CPA *(Drexel University)*. Clinical Professor. Global classrooms and use of backchannel research

Susan Epstein, MBA *(Drexel University)*. Associate Clinical Professor. Research surrounding the development writing in first year business students

Christopher Finnin, EdD *(Drexel University) Director, General Business Studies*. Associate Clinical Professor. Student engagement, learning communities, writing across the curriculum

Julia LaRosa, MBA *(Michigan State University)*. Associate Clinical Professor. Utilizing peer mentors to support the acculturation of international students

Eric Rios, MBA, M.ED *(Eastern University, Drexel University)*. Assistant Clinical Professor. Research on the needs of first generation college students

Legal Studies

Major: Legal Studies
Degree Awarded: Bachelor of Science in Business Administration (BSBA)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 22.0201
Standard Occupational Classification (SOC) code: 23-1011

About the Program

Law is pervasive in all aspects of business and life. The major in legal studies provides Drexel University students with the ability to recognize the influence of the law, understand its application and make informed and intelligent decisions regarding the course of action to take.

Although the major in legal studies will benefit those interested in pursuing a career in law, it is not intended solely for students aspiring to attend law school. This major enhances any business student's perspective on the impact of legal issues within their respective professions.

Students will learn the basics of various areas of the law and the legal environment of business and will learn to identify the factual situation in which to apply that law. They will be able to analyze the facts, determine which aspects of the law are pertinent, apply the law to the facts, and draw a conclusion. Clarity of thought, reasoning and expression (both oral and written) are additional results of this process.

Emphasis is on critical thinking as a tool for problem solving, so that whatever the discipline, students will be able to identify and prevent

possible problems or seek proper and timely assistance for critical decision making.

Additional Information

For more information about the program, contact the Department of Legal Studies (https://www.lebow.drexel.edu/faculty-and-research/disciplines/legal-studies/).

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Bachelor of Science in Business Administration (BSBA) Degree Requirements

General Education Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COM 270 [WI]	Business Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
PHIL 105	Critical Reasoning	3.0
PSY 101	General Psychology I	3.0
UNIV B101	The Drexel Experience	1.0
UNIV B201 [WI]	Career Management	1.0
English literature elective ENGL 200 through ENGL 399		3.0
Fine Arts elective		3.0
History (HIST) elective		4.0
Select two of the following:		6.0
BIO 100	Applied Cells, Genetics & Physiology	
or BIO 101	Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
General Education Electives		
Students select seven (21.0 credits) general education electives, with a minimum of one course in each of the following three categories. Students take the remaining 12.0 credits from any of the topics listed under Additional General Education Electives.		
Society and Culture		
Communication, English, Fine Arts, Global Studies, Language or Philosophy		3.0
Social Science		
Anthropology, History, Sociology, Political Science, Psychology		3.0
Science		
Computer Science, Information Systems, Science		3.0
Additional General Education Electives		
Twelve (12.0) credits must be earned by taking 4 courses from the following topics: Communication, English, Fine Arts, Global Studies, Language, Philosophy, Anthropology, History, Sociology, Political Science, Psychology, Computer Science, Information Systems, Math, Science		12.0
Business Requirements		
ACCT 115	Financial Accounting Foundations	4.0
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
BUSN 101	Foundations of Business I (Online students take BUSN 111)	4.0
BUSN 102	Foundations of Business II (Online students take BUSN 112)	4.0

ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
INTB 200	International Business	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
MIS 200	Management Information Systems	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 201	Introduction to Business Statistics	4.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
ORGB 420	Negotiations and Conflict Resolution	
STAT 202	Business Statistics II	
Major Requirements		
Eight required courses (See Major Requirements list below)		32.0
Free Electives		**18.0**
Total Credits		180.0

Legal Studies Major Degree Requirements

Select eight of the following:		**32.0**
BLAW 202	Business Law II	
BLAW 321	Law of Business Organizations	
BLAW 330	Real Estate	
BLAW 334	Labor Law	
BLAW 338	Government Regulation and Business	
BLAW 340	International Business Law	
BLAW 342	Criminal Law	
BLAW 346	Entrepreneurial Law	
BLAW 348	White Collar Crime	
BLAW 356	Legal Issues in Corporate Governance	
BLAW 358	Employment Law	
BLAW 360	Intellectual Property and Cyber Law	
Total Credits		32.0

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BUSN 101	Foundations of Business I	4.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV B101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
BUSN 102	Foundations of Business II	4.0
ECON 202	Principles of Macroeconomics	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	15.0
Term 3		
ACCT 115	Financial Accounting Foundations	4.0

ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
PSY 101	General Psychology I	3.0
General education elective		3.0
Society and culture elective		3.0
	Term Credits	16.0
Term 4		
ACCT 116	Managerial Accounting Foundations	4.0
STAT 201	Introduction to Business Statistics	4.0
History (HIST) elective		3.0
Select one of the following:		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology / Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
	Term Credits	14.0
Term 5		
BLAW 201	Business Law I	4.0
MIS 200	Management Information Systems	4.0
Select one of the following		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology / Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
Social science elective		3.0
	Term Credits	14.0
Term 6		
FIN 301	Introduction to Finance	4.0
MKTG 301	Introduction to Marketing Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
ENGL 200 Through ENGL 399		3.0
	Term Credits	15.0
Term 7		
Business Legal Studies (BLAW) Course		4.0
INTB 200	International Business	4.0
OPM 200	Operations Management	4.0
COM 270 [WI]	Business Communication	3.0
	Term Credits	15.0
Term 8		
PHIL 105	Critical Reasoning	3.0
Business Legal Studies (BLAW) Course		4.0
Select one of the following:		4.0
BUSN 451	Business Consulting	
MGMT 260	Introduction to Entrepreneurship	
MGMT 451	Management Simulation	
STAT 202	Business Statistics II	
Free elective		4.0
	Term Credits	15.0
Term 9		
Business Legal Studies (BLAW) Course		4.0
Business Legal Studies (BLAW) Course		4.0
Science elective		3.0
Free elective		4.0
	Term Credits	15.0
Term 10		
Business Legal Studies (BLAW) Course		4.0
Business Legal Studies (BLAW) Course		4.0
General education elective		3.0
Free elective		4.0
	Term Credits	15.0
Term 11		
Business Legal Studies (BLAW) Course		4.0

MGMT 450	Strategy and Competitive Advantage	4.0
Fine arts elective		3.0
Free electives		4.0
	Term Credits	15.0
Term 12		
Business Legal Studies (BLAW) Course		4.0
UNIV B201 [WI]	Career Management	1.0
General studies electives		3.0
General studies electives		3.0
Free electives		4.0
	Term Credits	15.0

Total Credit: 180.0

*   See degree requirements (p. 370).

Facilities

In fall 2013, LeBow College opened its 12-story, Gerri C. LeBow Hall, with a finance trading lab, behavioral studies lab and integrated teaching technology in all classrooms. The new building features two lecture halls, 15 classrooms of varying sizes and seating configurations, including case study rooms and cluster classrooms designed to facilitate group work. Other amenities consist of extensive areas of student spaces, including 19 collaboration rooms, two quiet study areas, and 3,500 square feet of student lounges. Gerri C. LeBow Hall brings together faculty, students and staff, in a state of the art building on the University City campus. Please visit the LeBow College of Business webpage (http://www.lebow.drexel.edu/about/campuses/philadelphia/location/gerri-c-lebow-hall/) to learn more about Gerri C. LeBow Hall.

Co-Op/Career Opportunities

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities. To learn more about career opportunities and resources see the Career Guides (http://drexel.edu/scdc/career-services/counseling/career-guides/) provided by the Steinbright Career Development Center.

Legal Studies Faculty

Roger D. Collons, JD, PhD *(George Washington University; Georgia State University) Department of Legal Studies.* Professor. Patent law, preservation of wealth.

Richard P. Freedman, JD, LLM *(Temple University) Head of the Department of Legal Studies.* Associate Professor. Taxation, corporate and business matters, real estate, estate planning, estate administration and elder law.

Andrew Genetta, JD *(Cleveland-Marshall College of Law).* Associate Clinical Professor.

Rosalie S. Kreider, JD *(Villanova University) Department of Legal Studies.* Clinical Professor. Business law, international business law.

Natalie Pedersen, JD *(Harvard University) Department of Legal Studies.* Associate Professor. Employment law; employment discrimination; implicit bias.

Steven R. Sher, JD *(Georgetown University Law Center) Department of Legal Studies.* Associate Professor. Business law, product liability, negligence, medical malpractice.

Emeritus Faculty

Neal Orkin, JD *(Temple University) Department of Legal Studies.* Associate Professor Emeritus. Intellectual property rights of employed inventors and authors; labor relations.

Management Information Systems

Major: Management Information Systems
Degree Awarded: Bachelor of Science in Business Administration (BSBA)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 52.1201
Standard Occupational Classification (SOC) code:11-3021

About the Major

Management Information Systems (MIS) is about managing how and why people, organizations, and markets apply, design, and deploy information technology to achieve tactical and strategic business goals. MIS is about the integration of both areas of expertise and applying the power of technology to solving business problems.

The major in management information systems prepares students for opportunities in the information technology field and business. Aimed at producing graduates who bridge the gap between technical knowledge and business functions, the program focuses on a mix of applied computer systems content, interpersonal interaction, and a practical business orientation.

While administered by the Department of Decision Sciences and MIS (https://www.lebow.drexel.edu/academics/undergraduate/areas-of-study/management-information-systems/), the major in management information systems is interdisciplinary in nature. The courses may be taken by students in other colleges and departments who wish to complement other computer-related studies with business-oriented information systems subjects.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Bachelor of Science in Business Administration (BSBA) Degree Requirements

General Education Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COM 270 [WI]	Business Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
PHIL 105	Critical Reasoning	3.0
PSY 101	General Psychology I	3.0
UNIV B101	The Drexel Experience	1.0

UNIV B201 [WI]	Career Management	1.0
English literature elective ENGL 200 through ENGL 399		3.0
Fine Arts elective		3.0
History (HIST) elective		4.0
Select two of the following:		6.0
BIO 100	Applied Cells, Genetics & Physiology	
or BIO 101	Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
General Education Electives		
Students select seven (21.0 credits) general education electives, with a minimum of one course in each of the following three categories. Students take the remaining 12.0 credits from any of the topics listed under Additional General Education Electives.		
Society and Culture		
Communication, English, Fine Arts, Global Studies, Language or Philosophy		3.0
Social Science		
Anthropology, History, Sociology, Political Science, Psychology		3.0
Science		
Computer Science, Information Systems, Science		3.0
Additional General Education Electives		
Twelve (12.0) credits must be earned by taking 4 courses from the following topics: Communication, English, Fine Arts, Global Studies, Language, Philosophy, Anthropology, History, Sociology, Political Science, Psychology, Computer Science, Information Systems, Math, Science		12.0
Business Requirements		
ACCT 115	Financial Accounting Foundations	4.0
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
BUSN 101	Foundations of Business I (Online students take BUSN 111)	4.0
BUSN 102	Foundations of Business II (Online students take BUSN 112)	4.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
INTB 200	International Business	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
MIS 200	Management Information Systems	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 201	Introduction to Business Statistics	4.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
ORGB 420	Negotiations and Conflict Resolution	
STAT 202	Business Statistics II	
Major Requirements		
Eight required courses (See Major Requirements list below)		32.0
Free Electives		**18.0**
Total Credits		180.0

Management Information Systems Major Required Courses		
MIS 342	Systems Analysis and Design	4.0
MIS 343	Database Design and Implementation	4.0
Select six of the following: *		24.0
MIS 346	Management Information Systems Strategy	
MIS 347	Domestic and Global Outsourcing Management	
MIS 348	Visual Basic Database Programming for Business	
MIS 349	Predictive Business Analytics with Relational Database Data	
MIS 351	Introduction to Programming for Business in C#	
MIS 352	Advanced Business Programming with ASP.Net	
MIS 361	Information System Project Management	
Total Credits		32.0

*   Students select from the following courses, or any other course at LeBow with the program manager's permission.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BUSN 101	Foundations of Business I	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV B101	The Drexel Experience	1.0
Select one of the following:		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
	Term Credits	15.0
Term 2		
BUSN 102	Foundations of Business II	4.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
Select one of the following:		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
	Term Credits	15.0
Term 3		

ACCT 115 or ECON 201	Financial Accounting Foundations Principles of Microeconomics	4.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PSY 101	General Psychology I	3.0
General education elective		3.0
Society and culture elective		3.0
	Term Credits	16.0
Term 4		
ACCT 115 or ECON 201	Financial Accounting Foundations Principles of Microeconomics	4.0
ACCT 116 or ECON 202	Managerial Accounting Foundations Principles of Macroeconomics	4.0
STAT 201	Introduction to Business Statistics	4.0
History (HIST) elective		4.0
	Term Credits	16.0
Term 5		
BLAW 201	Business Law I	4.0
ECON 202 or ACCT 116	Principles of Macroeconomics Managerial Accounting Foundations	4.0
MIS 200	Management Information Systems	4.0
Social science elective		3.0
	Term Credits	15.0
Term 6		
COM 270 [WI]	Business Communication	3.0
INTB 200	International Business	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
	Term Credits	15.0
Term 7		
FIN 301	Introduction to Finance	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
Science elective		3.0
Free elective		4.0
	Term Credits	15.0
Term 8		
MIS 342	Systems Analysis and Design	4.0
PHIL 105	Critical Reasoning	3.0
Management Information Systems (MIS) Major Course*		4.0
Free elective		4.0
	Term Credits	15.0
Term 9		
MIS 343	Database Design and Implementation	4.0
Management Information Systems (MIS) Major Course*		4.0
General Education elective		3.0
Free elective		4.0
	Term Credits	15.0
Term 10		
Management Information Systems (MIS) Major Courses*		8.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
MGMT 451	Management Simulation	
STAT 202	Business Statistics II	
General education elective		3.0
	Term Credits	15.0
Term 11		
MGMT 450	Strategy and Competitive Advantage	4.0
ENGL 200 - ENGL 399 course		3.0
Management Information Systems (MIS) Major Course*		4.0

Free elective		3.0
	Term Credits	14.0
Term 12		
UNIV B201 [WI]	Career Management	1.0
Management Information Systems (MIS) Major Course*		4.0
Fine arts elective		3.0
General education elective		3.0
Free electives		3.0
	Term Credits	14.0

Total Credit: 180.0

*   *See course options in the list of degree requirements.

Co-op/Career Opportunities

Career opportunities exist in a wide range of business settings. Students prepare for careers as managers of information resource units, or as staff members who develop and support computer systems.

Recent Management Information System (MIS) graduates have gone on to work for many types of businesses and other organizations. Some job titles include: Management Consultants, IS Business Analysts, IT Project Management, IT Consultants, IT Systems Managers, Systems Analysts. Some MIS students also choose to continue their studies with an MBA; recent Drexel MIS graduates are now attending Columbia, Princeton, and the University of Pennsylvania.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities. Also visit the Career Guides (http://drexel.edu/scdc/career-services/counseling/career-guides/) provided by the Steinbright Career Development Center.

Facilities

In fall 2013, LeBow College opened its 12-story, Gerri C. LeBow Hall, with a finance trading lab, behavioral studies lab and integrated teaching technology in all classrooms. The new building features two lecture halls, 15 classrooms of varying sizes and seating configurations, including case study rooms and cluster classrooms designed to facilitate group work. Other amenities consist of extensive areas of student spaces, including 19 collaboration rooms, two quiet study areas, and 3,500 square feet of student lounges. Gerri C. LeBow Hall brings together faculty, students and staff, in a state of the art building on the University City campus. Please visit the LeBow College of Business webpage (http://www.lebow.drexel.edu/about/campuses/philadelphia/location/gerri-c-lebow-hall/) to learn more about Gerri C. LeBow Hall.

Decision Sciences & MIS Faculty

Murugan Anandarajan, PhD *(Drexel University) Interim Associate Dean for Academic Affairs.* Professor. Cyber crime, strategic management of information technology, unstructured data mining, individual internet usage behavior (specifically abuse and addiction), application of artificial intelligence techniques in forensic accounting and ophthalmology.

Orakwue B. Arinze, PhD *(London School of Economics).* Professor. Client/Server computing; Enterprise Application Software (EAS)/ Enterprise Resource Planning Software (ERP); knowledge-based and decision support applications in operations management.

Avijit Banerjee, PhD *(The Ohio State University) Department of Decision Sciences.* Professor. Interface with Marketing, Pricing Revenue

Management, Inventory Control, Operations Planning and Scheduling, Production Planning and Control, Supply Chain Management

Hande Benson, PhD *(Princeton University)*. Professor. Interior-point methods, Large Scale Optimization, Mathematical Programming, Nonlinear Optimization, Operations and Supply Chain Optimization, Optimization Software, Portfolio Optimization

Qizhi Dai, PhD *(University of Minnesota)*. Associate Professor. Business Value of Information Technology, eCommerce, Economics of Information Technology, Information System Management.

Christopher Gaffney, PhD *(Rutgers University, New Brunswick)*. Assistant Clinical Professor. Applied Probability, Decision Theory, Risk Analysis

David Gefen, PhD *(Georgia State University) Provost Distinguished Research Professor*. Professor. Strategic IT management; IT development and implementation management; research methodology; managing the adoption of large IT systems, such as MRP II, ERP, and expert systems; research methodology, eCommerce; Online Auctions; Outsourcing; SAS; Technology Adoption.

Seung-Lae Kim, PhD *(Penn State University) Department of Decision Sciences*. Professor. Inventory control, Production Planning and Control, Quality Management, Six-Sigma, Supply Chain Management

Jinwook Lee, PhD *(Rutgers University, New Brunswick)*. Assistant Professor. Decision Models, Mathematical Programming, Risk Assessment Stochastic Optimization, Stochastic Processes.

Jeongsik Lee, PhD *(University of California Los Angeles)*. Assistant Professor. Economics of Innovation; Social networks; Technology management

Benjamin Lev, PhD *(Case Western Reserve University)*. Trustee Professor. Inventory Control, Mathematical Programming, Operations Planning and Scheduling.

Merrill W. Liechty, PhD *(Duke University)*. Clinical Professor. Bayesian statistics, portfolio selection, higher moment estimation, higher moment estimation, Markov Chain Monte Carlo

Hazem Maragah, PhD *(Louisiana University) Department of Decision Sciences*. Associate Professor. Statistical quality control, total equity management, applied statistics.

Bruce D. McCullough, PhD *(University of Texas Austin)*. Professor. Applied Econometrics, Data Mining, Econometric Techniques, Reliability of Statistical and Econometric Software.

Fariborz Y. Partovi, PhD *(The Wharton School, University of Pennsylvania) Department of Decision Sciences*. Professor. Manufacturing Technology Development, Quality Implementation, Quality Management, Service Management, Six-Sigma

Matthew Reindorp, PhD *(University of Maryland College Park) Interim Department Head, Decision Sciences & MIS*. Associate Clinical Professor. Real Options, Simulation, Stochastic Processes, Supply Chain Finance, Supply Chain Management

Samir Shah, DPS *(Pace University)*. Clinical Professor. Drexel University's Provost Fellow India Partnerships

Wenjing Shen, PhD *(University of Michigan) Department of Decision Sciences*. Associate Professor. The interface of operations management and marketing; inventory management; supply chain management.

Min Wang, PhD *(Columbia University) Department of Decision Sciences*. Associate Clinical Professor. Healthcare Operations Management, Inventory Control, Production Planning and Control, Service Management, Supply Chain Management

Chaojiang Wu, PhD *(University of Cincinnnati)*. Assistant Professor. Computational Statistics, Data Analytics, Data Mining, Decision Models, Predictive Analytics

Marketing

Major: Marketing
Degree Awarded: Bachelor of Science in Business Administration (BSBA)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 52.1401
Standard Occupational Classification (SOC) code: 11-2021

About the Program

Marketing is one of the most dynamic areas of business because it focuses on satisfying the ever-changing wants and needs of people. Professional marketers research and identify target audiences, develop products and services, formulate pricing strategies, develop advertising and promotional campaigns, and implement methods of distribution so that customers receive products and services where and when they want them. Perhaps the most basic marketing skill is to be able to see an organization's activities from the customer's viewpoint.

A major in marketing prepares students for the many opportunities that exist in product and brand management, marketing research, advertising, digital marketing, customer analytics, retailing, channel management, logistics and physical distribution, professional personal selling and sales management, purchasing, wholesaling, marketing planning and analysis, public relations, marketing entrepreneurship, and new-product development.

Additional Information

For more information about the major, contact the Department of Marketing (http://www.lebow.drexel.edu/academics/disciplines/marketing/).

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Bachelor of Science in Business Administration (BSBA) Degree Requirements

General Education Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COM 270 [WI]	Business Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0

or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
PHIL 105	Critical Reasoning	3.0
PSY 101	General Psychology I	3.0
UNIV B101	The Drexel Experience	1.0
UNIV B201 [WI]	Career Management	1.0
English literature elective ENGL 200 through ENGL 399		3.0
Fine Arts elective		3.0
History (HIST) elective		4.0
Select two of the following:		6.0
BIO 100	Applied Cells, Genetics & Physiology	
or BIO 101	Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	

General Education Electives

Students select seven (21.0 credits) general education electives, with a minimum of one course in each of the following three categories. Students take the remaining 12.0 credits from any of the topics listed under Additional General Education Electives.

Society and Culture

Communication, English, Fine Arts, Global Studies, Language or Philosophy	3.0

Social Science

Anthropology, History, Sociology, Political Science, Psychology	3.0

Science

Computer Science, Information Systems, Science	3.0

Additional General Education Electives

Twelve (12.0) credits must be earned by taking 4 courses from the following topics: Communication, English, Fine Arts, Global Studies, Language, Philosophy, Anthropology, History, Sociology, Political Science, Psychology, Computer Science, Information Systems, Math, Science	12.0

Business Requirements

ACCT 115	Financial Accounting Foundations	4.0
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
BUSN 101	Foundations of Business I (Online students take BUSN 111)	4.0
BUSN 102	Foundations of Business II (Online students take BUSN 112)	4.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
INTB 200	International Business	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
MIS 200	Management Information Systems	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 201	Introduction to Business Statistics	4.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
ORGB 420	Negotiations and Conflict Resolution	
STAT 202	Business Statistics II	

Major Requirements

Eight required courses (See Major Requirements list below)		32.0
Free Electives		**18.0**
Total Credits		180.0

Marketing Major Required Course

MKTG 326	Marketing Insights	4.0
MKTG 356	Consumer Behavior	4.0

MKTG 380	Seminar in Marketing Strategy	4.0
Select five of the following:		20.0
MKTG 321	Selling and Sales Management	
MKTG 322	Advertising & Integrated Marketing Communications	
MKTG 324	Marketing Channels and Distribution Systems	
MKTG 344	Professional Personal Selling	
MKTG 347	New Product Development	
MKTG 348	Services Marketing	
MKTG 351	Marketing for Non-Profit Organizations	
MKTG 355	Interactive Marketing	
MKTG 357	Global Marketing	
MKTG 362	Brand and Reputation Management	
MKTG 364	Marketing for New Ventures	
MKTG 365	Digital Marketing	
MKTG 366	Customer Analytics	
MKTG 367	Data-Driven Digital Marketing	
MKTG 368	Corporate Responsibility Management	
Total Credits		32.0

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Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BUSN 101	Foundations of Business I	4.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV B101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
BUSN 102	Foundations of Business II	4.0
ECON 202	Principles of Macroeconomics	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	15.0
Term 3		
ACCT 115	Financial Accounting Foundations	4.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PSY 101	General Psychology I	3.0
General education elective		3.0
Society and culture course		3.0
	Term Credits	17.0
Term 4		
ACCT 116	Managerial Accounting Foundations	4.0
STAT 201	Introduction to Business Statistics	4.0
Select one of the following		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
History elective		4.0
	Term Credits	15.0

Term 5

BLAW 201	Business Law I	4.0
COM 270 [WI]	Business Communication	3.0
INTB 200	International Business	4.0
Select one of the following		3.0
CHEM 151	Applied Chemistry	
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	
PHYS 151	Applied Physics	
	Term Credits	14.0

Term 6

FIN 301	Introduction to Finance	4.0
MKTG 201	Introduction to Marketing Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
ENGL 200 Through ENGL 399		3.0
	Term Credits	15.0

Term 7

MIS 200	Management Information Systems	4.0
OPM 200	Operations Management	4.0
MKTG major course		4.0
Science or Computer Science elective		3.0
	Term Credits	15.0

Term 8

PHIL 105	Critical Reasoning	3.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
MGMT 451	Management Simulation	
STAT 202	Business Statistics II	
Free electives		4.0
MKTG major course		4.0
	Term Credits	15.0

Term 9

MKTG major courses		8.0
General education elective		3.0
Free electives		4.0
	Term Credits	15.0

Term 10

MGMT 450	Strategy and Competitive Advantage	4.0
Fine arts elective		3.0
MKTG major courses		8.0
	Term Credits	15.0

Term 11

MKTG 380	Seminar in Marketing Strategy	4.0
UNIV B201 [WI]	Career Management	1.0
General education elective		3.0
Social science elective		3.0
Free elective		3.0
	Term Credits	14.0

Term 12

MKTG major course		4.0
General education elective		3.0
Free electives		7.0
	Term Credits	14.0

Total Credit: 180.0

Co-op/Career Opportunities

Marketing opportunities abound in all types of organizations — including manufacturing firms, wholesalers, retail stores, Internet firms, service organizations, banking and financial institutions, law and accounting firms, hospitals, colleges and universities, museums, chambers of commerce, professional sports teams, government agencies, charitable foundations, churches, and countless other settings. Any organization that seeks to reach a particular audience or consumer group needs the skills of marketers.

There are many specialized jobs in marketing, including product and brand managers, marketing researchers, advertising executives, pricing analysts, direct (non-store) marketers, Internet marketers, professional buyers, manufacturing agents, transportation and distribution managers, industrial and consumer salespeople, stockbrokers, sales managers, college enrollment managers, wholesalers, retailers, marketing planners, sales forecasters, marketing cost analysts, public relations managers, media and event planners, sales promotion managers, trade show or exhibit marketers, new product development managers, management consultants, digital marketers, marketing data analytics and international marketers.

Co-op Experiences

When students complete their co-op jobs, they are asked to write an overview of their experiences.These brief quotes are taken from some recent student reports:

Marketing research assistant, manufacturing firm: "Assisted in the development of new products, which included gathering information concerning competitive products, markets, pricing. Conducted testing of new products. Assisted in special projects. . .gained good experience."

Retail analyst, producer of luxury home products: "Supported the sales and production divisions.Tracked weekly and monthly sales information. Developed product placement charts for forecasting. Assisted in maintaining productivity reports. Developed and presented a window treatment market analysis."

Activity-based management (ABM) analyst, pharmaceuticals manufacturer: "Supported the ABM team (5 people). Member of two sub-project teams. Maintained full participation on both sub-teams while still maintaining responsibilities on core team. Developed proficiencies in re-engineering methodologies, activity-based costing methodologies, and support of change management. . .included as a full team member. "

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities. Also visit the Career Guides (http://drexel.edu/scdc/career-services/counseling/career-guides/) provided by the Steinbright Career Development Center.

Facilities

In fall 2013, LeBow College opened its 12-story, Gerri C. LeBow Hall, with a finance trading lab, behavioral studies lab and integrated teaching technology in all classrooms. The new building features two lecture halls, 15 classrooms of varying sizes and seating configurations, including case study rooms and cluster classrooms designed to facilitate group work. Other amenities consist of extensive areas of student spaces, including 19 collaboration rooms, two quiet study areas, and 3,500 square feet of student lounges. Gerri C. LeBow Hall brings together faculty, students and staff, in a state of the art building on the University City campus. Please visit the LeBow College of Business webpage (http://www.lebow.drexel.edu/about/campuses/philadelphia/location/gerri-c-lebow-hall/) to learn more about Gerri C. LeBow Hall.

Marketing Faculty

Rolph E. Anderson, PhD *(University of Florida) Royal H. Gibson Sr. Professor of Marketing*. Professor. Personal selling and sales management; multivariate data analysis; customer relationship management (CRM); customer satisfaction and customer loyalty.

Trina larsen Andras, PhD *(University of Texas at Austin) Head of the Department of Marketing; Academic Director, Center for Corporate Research Management*. Professor. International marketing, marketing channels management, cross-cultural communication.

Boryana Dimitrova, PhD *(Drexel University)*. Assistant Clinical Professor. Global marketing, inter-organizational, marketing channels, retailing and retail management.

Michaela Draganska, PhD *(Kellogg School of Management, Northwestern University) Department of Marketing*. Associate Professor. Advertising strategy, product assortment decisions, new product positioning, distribution channels. Marketing analytics and big data, marketing communications, marketing research, marketing strategy, technology and innovation.

Lawrence Duke, MBA *(Harvard Business School)*. Associate Clinical Professor. International marketing and strategy, new product development, business-to-business marketing, marketing of financial services.

Elea Feit, PhD *(University of Michigan) Department of Marketing*. Assistant Professor. Bayesian hierarchical models, interactive (eCommerce), marketing research, missing data.

William Halvena, PhD *(Columbia University)*. Associate Clinical Professor. Quantitative Marketing, Marketing Research, Consumer Behavior

Michael Howley, PhD *(Arizona State University)*. Clinical Professor. Investments in dissatisfied customers, service recovery, health-care marketing, marketing of service organizations, financial consequences of marketing actions.

Yanliu Huang, PhD *(The Wharton School, University of Pennsylvania)*. Associate Professor. Consumer n-store decision making, consumer planning, health marketing, memory and learning.

Daniel Korschun, PhD *(Boston University)*. Associate Professor. Brand and corporate reputation management, corporate social responsibility, internal marketing, marketing strategy, relationship marketing.

Bert Rosenbloom, PhD *(Temple University) Rauth Chair of Electronic Commerce*. Professor. Marketing channels and distribution systems, electronic commerce, inter-organizational marketing management, wholesale and retail distribution, marketing strategy and planning.

Prashant Srivastava, PhD *(Oklahoma State University)*. Associate Clinical Professor. New product development, supply chain management, B2B marketing, sales, strategic alliances, organizational learning, market orientation, healthcare marketing, and database marketing.

Rajneesh Suri, PhD *(University of Illinois at Urbana-Champaign) Associate Dean for Research, Marketing Department*. Professor. Pricing, promotions and branding.

Srinivasan Swaminathan, PhD *(University of Texas-Austin)*. Professor. Marketing research and strategy, pricing and promotions, loyalty and satisfaction.

Chen Wang, PhD *(University of British Columbia)*. Associate Professor. Consumer curiosity, self-regulation and goals, sensory perception.

Operations & Supply Chain Management

Major: Operations & Supply Chain Management
Degree Awarded: Bachelor of Science in Business Administration (BSBA)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 52.0205
Standard Occupational Classification (SOC) code: 11-3051

About the Program

The major in Operations & Supply Chain Management is designed to prepare students for eventual participation as managers or specialists in the operations activity of industrial and service systems. Today, companies worldwide are competing in very different ways and very different environments than they were in the past because of technological advances. Operations, Supply Chain Management, and Logistics are key functions through which companies can gain strategic advantage, and companies are hiring graduates to drive innovations for their new economic surroundings. In this major, courses drawing on the foundations and the state-of-the-art for both production and service industries allow students to craft a course of study that can meet industry standards.

Additional Information

For additional information about the program, students should contact the Department of Decision Sciences and MIS (https://www.lebow.drexel.edu/academics/undergraduate/areas-of-study/operations-management/).

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Bachelor of Science in Business Administration (BSBA) Degree Requirements

General Education Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COM 270 [WI]	Business Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
PHIL 105	Critical Reasoning	3.0
PSY 101	General Psychology I	3.0
UNIV B101	The Drexel Experience	1.0
UNIV B201 [WI]	Career Management	1.0
English literature elective ENGL 200 through ENGL 399		3.0
Fine Arts elective		3.0

History (HIST) elective		4.0
Select two of the following:		6.0
BIO 100	Applied Cells, Genetics & Physiology	
or BIO 101	Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	

General Education Electives

Students select seven (21.0 credits) general education electives, with a minimum of one course in each of the following three categories. Students take the remaining 12.0 credits from any of the topics listed under Additional General Education Electives.		
Society and Culture		
Communication, English, Fine Arts, Global Studies, Language or Philosophy		3.0
Social Science		
Anthropology, History, Sociology, Political Science, Psychology		3.0
Science		
Computer Science, Information Systems, Science		3.0

Additional General Education Electives

| Twelve (12.0) credits must be earned by taking 4 courses from the following topics: Communication, English, Fine Arts, Global Studies, Language, Philosophy, Anthropology, History, Sociology, Political Science, Psychology, Computer Science, Information Systems, Math, Science | | 12.0 |

Business Requirements

ACCT 115	Financial Accounting Foundations	4.0
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
BUSN 101	Foundations of Business I (Online students take BUSN 111)	4.0
BUSN 102	Foundations of Business II (Online students take BUSN 112)	4.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
INTB 200	International Business	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
MIS 200	Management Information Systems	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 201	Introduction to Business Statistics	4.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
ORGB 420	Negotiations and Conflict Resolution	
STAT 202	Business Statistics II	

Major Requirements

Eight required courses (See Major Requirements list below)		32.0
Free Electives		**18.0**
Total Credits		180.0

Operations and Supply Chain Management Major Requirements

OPM 315	Service Operations Management	4.0
OPM 321	Planning and Control of Operations	4.0
OPM 325	Advanced Planning and Control of Operations	4.0
OPM 341	Supply Chain Management	4.0
OPR 320	Linear Models for Decision Making	4.0
Select three of the following:		12.0
MGMT 301	Designing Innovative Organizations	
MGMT 364	Technology Management	
OPM 342	Sustainable Supply Chain Management and Logistics	
OPM 343	Managing Queues for Service Operations	
OPM 344	Revenue Management	
OPM 399	Operations & Supply Chain Management Industry Project	
OPR 330	Advanced Decision Making and Simulation	

OPR 340	Decision Models for the Public Sector	
STAT 325	Six-Sigma Quality Implementation	
STAT 331	Introduction to Data Mining for Business	
STAT 335	Introduction to Experimental Design	
Total Credits		32.0

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BUSN 101	Foundations of Business I	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV B101	The Drexel Experience	1.0
ECON 201	Principles of Microeconomics	4.0
	Term Credits	16.0
Term 2		
BUSN 102	Foundations of Business II	4.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
ECON 202	Principles of Macroeconomics	4.0
	Term Credits	16.0
Term 3		
ACCT 115	Financial Accounting Foundations	4.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PSY 101	General Psychology I	3.0
Social science course[*]		3.0
Society and culture course[*]		3.0
	Term Credits	16.0
Term 4		
STAT 201	Introduction to Business Statistics	4.0
ACCT 116	Managerial Accounting Foundations	4.0
History elective		4.0
Select one of the following:		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
	Term Credits	15.0
Term 5		
COM 270 [WI]	Business Communication	3.0
BLAW 201	Business Law I	4.0
INTB 200	International Business	4.0
Select one of the following:		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
	Term Credits	14.0
Term 6		
MIS 200	Management Information Systems	4.0
OPM 200	Operations Management	4.0
MKTG 201	Introduction to Marketing Management	4.0

ENGL 200 Through ENGL 399		3.0
	Term Credits	15.0
Term 7		
FIN 301	Introduction to Finance	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
Science or Computer Science elective[*]		3.0
Free elective		4.0
	Term Credits	15.0
Term 8		
OPM 321	Planning and Control of Operations	4.0
OPR 320	Linear Models for Decision Making	4.0
PHIL 105	Critical Reasoning	3.0
Free elective		4.0
	Term Credits	15.0
Term 9		
OPM 315	Service Operations Management	4.0
OPM 325	Advanced Planning and Control of Operations	4.0
General Education Elective[*]		3.0
Free Elective		4.0
	Term Credits	15.0
Term 10		
UNIV B201 [WI]	Career Management	1.0
Operations & Supply Chain Mgmt major course		4.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
MGMT 451	Management Simulation	
STAT 202	Business Statistics II	
General education elective[*]		3.0
General education elective		3.0
	Term Credits	15.0
Term 11		
Operations & Supply Chain Mgmt major course		4.0
MGMT 450	Strategy and Competitive Advantage	4.0
General education elective[*]		3.0
Free elective		3.0
	Term Credits	14.0
Term 12		
Operations & Supply Chain Mgmt major course		4.0
OPM 341	Supply Chain Management	4.0
Fine arts elective		3.0
Free electives		3.0
	Term Credits	14.0

Total Credit: 180.0

[*]   See degree requirements (p. 378).

Co-op/Career Opportunities

Operations & Supply Chain Management students go on to work in a variety of fields, including manufacturing, product planning and research and development. The #4 and #6 on the Top 10 Best Business Jobs in the US News and World Report rankings are Operations Analysts and Logistics Analysts. According to the Bureau of Labor Statistics (https://www.bls.gov/), the number of jobs in Operations & Supply Chain Management will grow 13-22% over the next 7 years. The Operations & Supply Chain Management major is the top BSBA Major in LeBow for job placement satisfaction. The average starting salary of our graduates is $50,667.

Co-op Placements

Operations & Supply Chain Management majors land some of the most prestigious and highest paying co-op assignments. Our co-op employers include:

- Estee Lauder
- PECO Energy
- Johnson & Johnson
- Bimbo Bakeries
- Exelon Corporation

The average weekly co-op salary is $517.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities. Also visit the Career Guides (http://drexel.edu/scdc/career-services/counseling/career-guides/) provided by the Steinbright Career Development Center.

Facilities

In fall 2013, LeBow College opened its 12-story, Gerri C. LeBow Hall, with a finance trading lab, behavioral studies lab and integrated teaching technology in all classrooms. The new building features two lecture halls, 15 classrooms of varying sizes and seating configurations, including case study rooms and cluster classrooms designed to facilitate group work. Other amenities consist of extensive areas of student spaces, including 19 collaboration rooms, two quiet study areas, and 3,500 square feet of student lounges. Gerri C. LeBow Hall brings together faculty, students and staff, in a state of the art building on the University City campus. Please visit the LeBow College of Business webpage (http://www.lebow.drexel.edu/about/campuses/philadelphia/location/gerri-c-lebow-hall/) to learn more about Gerri C. LeBow Hall.

Decision Sciences & MIS Faculty

Murugan Anandarajan, PhD *(Drexel University) Interim Associate Dean for Academic Affairs.* Professor. Cyber crime, strategic management of information technology, unstructured data mining, individual internet usage behavior (specifically abuse and addiction), application of artificial intelligence techniques in forensic accounting and ophthalmology.

Orakwue B. Arinze, PhD *(London School of Economics).* Professor. Client/Server computing; Enterprise Application Software (EAS)/Enterprise Resource Planning Software (ERP); knowledge-based and decision support applications in operations management.

Avijit Banerjee, PhD *(The Ohio State University) Department of Decision Sciences.* Professor. Interface with Marketing, Pricing Revenue Management, Inventory Control, Operations Planning and Scheduling, Production Planning and Control, Supply Chain Management

Hande Benson, PhD *(Princeton University).* Professor. Interior-point methods, Large Scale Optimization, Mathematical Programming, Nonlinear Optimization, Operations and Supply Chain Optimization, Optimization Software, Portfolio Optimization

Qizhi Dai, PhD *(University of Minnesota).* Associate Professor. Business Value of Information Technology, eCommerce, Economics of Information Technology, Information System Management.

Christopher Gaffney, PhD *(Rutgers University, New Brunswick).* Assistant Clinical Professor. Applied Probability, Decision Theory, Risk Analysis

David Gefen, PhD *(Georgia State University) Provost Distinguished Research Professor*. Professor. Strategic IT management; IT development and implementation management; research methodology; managing the adoption of large IT systems, such as MRP II, ERP, and expert systems; research methodology, eCommerce; Online Auctions; Outsourcing; SAS; Technology Adoption.

Seung-Lae Kim, PhD *(Penn State University) Department of Decision Sciences*. Professor. Inventory control, Production Planning and Control, Quality Management, Six-Sigma, Supply Chain Management

Jinwook Lee, PhD *(Rutgers University, New Brunswick)*. Assistant Professor. Decision Models, Mathematical Programming, Risk Assessment Stochastic Optimization, Stochastic Processes.

Jeongsik Lee, PhD *(University of California Los Angeles)*. Assistant Professor. Economics of Innovation; Social networks; Technology management

Benjamin Lev, PhD *(Case Western Reserve University)*. Trustee Professor. Inventory Control, Mathematical Programming, Operations Planning and Scheduling.

Merrill W. Liechty, PhD *(Duke University)*. Clinical Professor. Bayesian statistics, portfolio selection, higher moment estimation, higher moment estimation, Markov Chain Monte Carlo

Hazem Maragah, PhD *(Louisiana University) Department of Decision Sciences*. Associate Professor. Statistical quality control, total equity management, applied statistics.

Bruce D. McCullough, PhD *(University of Texas Austin)*. Professor. Applied Econometrics, Data Mining, Econometric Techniques, Reliability of Statistical and Econometric Software.

Fariborz Y. Partovi, PhD *(The Wharton School, University of Pennsylvania) Department of Decision Sciences*. Professor. Manufacturing Technology Development, Quality Implementation, Quality Management, Service Management, Six-Sigma

Matthew Reindorp, PhD *(University of Maryland College Park) Interim Department Head, Decision Sciences & MIS*. Associate Clinical Professor. Real Options, Simulation, Stochastic Processes, Supply Chain Finance, Supply Chain Management

Samir Shah, DPS *(Pace University)*. Clinical Professor. Drexel University's Provost Fellow India Partnerships

Wenjing Shen, PhD *(University of Michigan) Department of Decision Sciences*. Associate Professor. The interface of operations management and marketing; inventory management; supply chain management.

Min Wang, PhD *(Columbia University) Department of Decision Sciences*. Associate Clinical Professor. Healthcare Operations Management, Inventory Control, Production Planning and Control, Service Management, Supply Chain Management

Chaojiang Wu, PhD *(University of Cincinnnati)*. Assistant Professor. Computational Statistics, Data Analytics, Data Mining, Decision Models, Predictive Analytics

Organizational Management

Co-Major: Organizational Management
Degree Awarded: Bachelor of Science in Business Administration (BSBA)

Calendar Type: Quarter
Total Credit Hours: 186.0
Classification of Instructional Programs (CIP) code: 52.0206
Standard Occupational Classification (SOC) code: 11-9199; 11-9151

The Organizational Management program is a co-major that must be taken in conjunction with the following majors Accounting, Finance, International Business, Legal Studies, Management Information Systems, Marketing, Operations and Supply Chain Management, Real Estate Management and Development or Sport Business.

About the Program

The co-major in "Organizational Management" is designed for students with varied backgrounds who seek to develop knowledge and skills in leadership, teamwork, and communication. These organizational management skills are intended to supplement core technical skills such as Finance, Accounting, Marketing, etc. The curriculum provides students with a foundation of skills for effectively working with others in a variety of contexts and situations.

Learning Goals

Upon completing the co-major, students will be able to:

- Discover important insights about oneself as a leader and develop a self-awareness of strengths and opportunities for personal growth
- Manage career and networks to achieve personal growth
- Develop the skills and competencies needed to lead effectively in today's dynamic and diverse environment
- Increase conceptual understanding of leadership in different types of situations and facing different types of challenges
- Learn how to influence and manage conflict within organizations
- Identify various approaches and imperatives for leading teams
- Recognize ethical dilemmas in management practice and how to infuse ethical standards within a group or team
- Learn how to effectively function within a team and lead a team for success
- Recognize how human factors can both distort and enhance the process of managerial decision making
- Understand how the changing nature of work (e.g., global, technological, etc.) influences choices about design and practices within organizations

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Bachelor of Science in Business Administration (BSBA) Degree Requirements

General Education Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COM 270 [WI]	Business Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	

MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
PHIL 105	Critical Reasoning	3.0
PSY 101	General Psychology I	3.0
UNIV B101	The Drexel Experience	1.0
UNIV B201 [WI]	Career Management	1.0
English literature elective ENGL 200 through ENGL 399		3.0
Fine Arts elective		3.0
History (HIST) elective		4.0
Select two of the following:		6.0
BIO 100	Applied Cells, Genetics & Physiology	
or BIO 101	Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	

General Education Electives

Students select seven (21.0 credits) general education electives, with a minimum of one course in each of the following three categories. Students take the remaining 12.0 credits from any of the topics listed under Additional General Education Electives.

Society and Culture	
Communication, English, Fine Arts, Global Studies, Language or Philosophy	3.0
Social Science	
Anthropology, History, Sociology, Political Science, Psychology	3.0
Science	
Computer Science, Information Systems, Science	3.0

Additional General Education Electives

Twelve (12.0) credits must be earned by taking 4 courses from the following topics: Communication, English, Fine Arts, Global Studies, Language, Philosophy, Anthropology, History, Sociology, Political Science, Psychology, Computer Science, Information Systems, Math, Science	12.0

Business Requirements

ACCT 115	Financial Accounting Foundations	4.0
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
BUSN 101	Foundations of Business I (Online students take BUSN 111)	4.0
BUSN 102	Foundations of Business II (Online students take BUSN 112)	4.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
INTB 200	International Business	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
MIS 200	Management Information Systems	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 201	Introduction to Business Statistics	4.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
ORGB 420	Negotiations and Conflict Resolution	
STAT 202	Business Statistics II	

Major Requirements

Eight required courses (See Major Requirements list below)	32.0
Free Electives	**18.0**
Total Credits	180.0

Co-Major Required Courses

Required Courses

ORGB 320	Leadership: Theory and Practice	4.0
ORGB 400	Team Development and Leadership	4.0
ORGB 420	Negotiations and Conflict Resolution	4.0

ORGB 430	Strategic Career Development	4.0
Select two of the following:		**8.0**
HRMT 323	Principles of Human Resource Administration	
MGMT 301	Designing Innovative Organizations	
MGMT 370	For-Profit Business Consulting	
MGMT 364	Technology Management	
Total Credits		24.0

Primary Major Courses

Students completing the Organizational Management co-major (requirements listed above) must do so in conjunction with a primary business major. Students must select a primary major from the following list (Accounting, Finance, Legal Studies, International Business, Management Information Systems, Marketing, or Operations & Supply Chain Management.)

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BUSN 101	Foundations of Business I	4.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV B101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
BUSN 102	Foundations of Business II	4.0
CIVC 101	Introduction to Civic Engagement	1.0
ECON 202	Principles of Macroeconomics	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	16.0
Term 3		
ACCT 115	Financial Accounting Foundations	4.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PSY 101	General Psychology I	3.0
Select one of the following:		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
General Education elective		3.0
	Term Credits	16.0
Term 4		
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
COM 270 [WI]	Business Communication	3.0
STAT 201	Introduction to Business Statistics	4.0
	Term Credits	15.0
Term 5		
INTB 200	International Business	4.0
MIS 200	Management Information Systems	4.0
Select one of the following:		3.0

BIO 100	Applied Cells, Genetics & Physiology	
or 101	Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
Social Science elective		3.0
	Term Credits	14.0
Term 6		
ENGL 200 through ENGL 399		3.0
FIN 301	Introduction to Finance	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
	Term Credits	15.0
Term 7		
ORGB 300 [WI]	Organizational Behavior	4.0
ORGB 320	Leadership: Theory and Practice	4.0
PHIL 105	Critical Reasoning	3.0
Primary major course		4.0
	Term Credits	15.0
Term 8		
ORGB 400	Team Development and Leadership	4.0
Primary major courses		8.0
History (HIST) elective		4.0
	Term Credits	16.0
Term 9		
ORGB 420	Negotiations and Conflict Resolution	4.0
Primary major courses		8.0
Society and Culture elective		3.0
	Term Credits	15.0
Term 10		
ORGB 430	Strategic Career Development	4.0
UNIV B201 [WI]	Career Management	1.0
Primary major course		4.0
Fine Arts elective		3.0
General Education elective		3.0
	Term Credits	15.0
Term 11		
MGMT 450	Strategy and Competitive Advantage	4.0
Select one of the following:		4.0
HRMT 323	Principles of Human Resource Administration	
MGMT 301	Designing Innovative Organizations	
MGMT 370	For-Profit Business Consulting	
MGMT 451	Management Simulation	
Primary major course		4.0
Science or Computer Science elective		3.0
	Term Credits	15.0
Term 12		
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
MGMT 364	Technology Management	
STAT 202	Business Statistics II	
Select one of the following:		4.0
HRMT 323	Principles of Human Resource Administration	
MGMT 301	Designing Innovative Organizations	
MGMT 370	For-Profit Business Consulting	
Primary major course		4.0
General Education electives		6.0
	Term Credits	18.0

Total Credit: 186.0

Organizational Management Faculty

Lauren D'Innocenzo, PhD *(University of Connecticut)*. Associate Professor. Team effectiveness, contextual influences, emergent team dynamics, shared leadership, multi-level modeling, and groups/teams.

Cuneyt Gozu, PhD *(University of Albany)*. Associate Clinical Professor. Attitudes; Groups/Teams; Leadership; Motivation; Power and Influence

Jeffrey H. Greenhaus, PhD *(New York University) William A. Mackie Professor of Management*. Professor. Work-Life Balance.

David Kurz, EdD *(University of Pennsylvania)*. Associate Clinical Professor. Business Education; Groups/Teams; Leadership; Supply Chain Leadership.

Mary Mawritz, PhD *(University of Central Florida)*. Associate Professor. Abusive supervision; deviant behavior; leadership.

Christian Resick, PhD *(Wayne State University)*. Associate Professor. Groups/Teams; Leadership; Organizational Culture and Fit; Personality.

Joan Weiner, PhD *(The Wharton School, University of Pennsylvania)*. Professor. Business ethics, leadership, communication and decision making; educational innovation; health system management design.

Jonathan C. Ziegert, PhD *(University of Maryland) Management Department*. Associate Professor. Attitudes; Diversity; Groups/Teams; Leadership; Organizational Culture and Fit.

Wendy van Ginkel, PhD *(Eramus University Rotterdam) Management Department*. Associate Professor. Team dynamics; Knowledge sharing; Diversity; Team cognition.

Daan van Knippenberg, PhD *(Leiden University) Joseph F. Rocereto Professor, Academic Director of the Institute of Strategic Leadership*. Professor. Leadership; Diversity; Teams; Team Innovation.

Real Estate Management and Development

Major: Real Estate Management and Development
Degree Awarded: Bachelor of Science in Business Administration (BSBA)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 52.1501
Standard Occupational Classification (SOC) code: 11-9141

About the Program

Drexel's Real Estate Management and Development major encompasses foundation courses in real estate operations, management and development, including specialized courses in sustainability, asset management, real finance, and law. The major balances students' need for critical thinking and business acumen skills by including core business, social sciences, and humanities courses. Students in this full-time, face-to-face major will benefit from Philadelphia's outdoor classroom – its diverse real estate market. The curriculum also includes a co-op experience that partners classroom knowledge with experiential learning to further develop the requisite skills students need to succeed

as real estate management and development professionals in the built environment.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Bachelor of Science in Business Administration (BSBA) Degree Requirements

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COM 270 [WI]	Business Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
PHIL 105	Critical Reasoning	3.0
PSY 101	General Psychology I	3.0
UNIV B101	The Drexel Experience	1.0
UNIV B201 [WI]	Career Management	1.0
English literature elective ENGL 200 through ENGL 399		3.0
Fine Arts elective		3.0
History (HIST) elective		4.0
Select two of the following:		6.0
BIO 100	Applied Cells, Genetics & Physiology	
or BIO 101	Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	

General Education Electives

Students select seven (21.0 credits) general education electives, with a minimum of one course in each of the following three categories. Students take the remaining 12.0 credits from any of the topics listed under Additional General Education Electives.

Society and Culture	
Communication, English, Fine Arts, Global Studies, Language or Philosophy	3.0
Social Science	
Anthropology, History, Sociology, Political Science, Psychology	3.0
Science	
Computer Science, Information Systems, Science	3.0

Additional General Education Electives

Twelve (12.0) credits must be earned by taking 4 courses from the following topics: Communication, English, Fine Arts, Global Studies, Language, Philosophy, Anthropology, History, Sociology, Political Science, Psychology, Computer Science, Information Systems, Math, Science	12.0

Business Requirements

ACCT 115	Financial Accounting Foundations	4.0
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
BUSN 101	Foundations of Business I (Online students take BUSN 111)	4.0
BUSN 102	Foundations of Business II (Online students take BUSN 112)	4.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
INTB 200	International Business	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
MIS 200	Management Information Systems	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 201	Introduction to Business Statistics	4.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
ORGB 420	Negotiations and Conflict Resolution	
STAT 202	Business Statistics II	

Major Requirements

Eight required courses (See Major Requirements list below)	32.0
Free Electives	**18.0**
Total Credits	180.0

Real Estate Management & Development (REMD) Major Courses

BLAW 330	Real Estate	4.0
FIN T480	Special Topics in FIN	4.0
MGMT 210	Research Methods I	2.0
MGMT 211	Research Methods II	2.0
REMD 110	Introduction to Real Estate Management	4.0
REMD 320	Sustainability in the Built Environment	4.0
REMD 375	Real Estate Finance	4.0
REMD 410	Real Estate Investment and Asset Management	4.0
REMD 491	Senior Capstone in Real Estate Management & Development	4.0
Total Credits		32.0

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BUSN 101	Foundations of Business I	4.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV B101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
BUSN 102	Foundations of Business II	4.0
ECON 202	Principles of Macroeconomics	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	15.0
Term 3		
ACCT 115	Financial Accounting Foundations	4.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PSY 101	General Psychology I	3.0
General Education elective		3.0
Society and Culture elective		3.0
	Term Credits	17.0
Term 4		
ACCT 116	Managerial Accounting Foundations	4.0
STAT 201	Introduction to Business Statistics	4.0

BIO 100, 101, CHEM 151, or PHYS 151	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution Applied Chemistry Applied Physics	3.0
History elective		4.0
	Term Credits	15.0
Term 5		
BIO 100, 101, CHEM 151, or PHYS 151	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution Applied Chemistry Applied Physics	3.0
BLAW 201	Business Law I	4.0
COM 270 [WI]	Business Communication	3.0
INTB 200	International Business	4.0
	Term Credits	14.0
Term 6		
ENGL 200 - ENGL 399		3.0
FIN 301	Introduction to Finance	4.0
MKTG 201	Introduction to Marketing Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
	Term Credits	15.0
Term 7		
BLAW 330	Real Estate	4.0
MIS 200	Management Information Systems	4.0
OPM 200	Operations Management	4.0
REMD 110	Introduction to Real Estate Management	4.0
	Term Credits	16.0
Term 8		
FIN T480	Special Topics in FIN	4.0
PHIL 105	Critical Reasoning	3.0
REMD 320	Sustainability in the Built Environment	4.0
MGMT 260, 370, 371, ORGB 420, or STAT 202	Introduction to Entrepreneurship For-Profit Business Consulting Nonprofit Business Consulting Negotiations and Conflict Resolution Business Statistics II	4.0
	Term Credits	15.0
Term 9		
REMD 375	Real Estate Finance	4.0
General Education Elective		3.0
Free electives		6.0
	Term Credits	13.0
Term 10		
REMD 410	Real Estate Investment and Asset Management	4.0
REMD 491	Senior Capstone in Real Estate Management & Development	4.0
General Education elective		3.0
Free electives		6.0
	Term Credits	17.0
Term 11		
MGMT 210	Research Methods I	2.0
MGMT 211	Research Methods II	2.0
MGMT 450	Strategy and Competitive Advantage	4.0
UNIV B201 [WI]	Career Management	1.0
General Education elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 12		
General Education elective		3.0
Free electives		9.0
	Term Credits	12.0

Total Credit: 180.0

Finance Faculty

David A. Becher, PhD *(Pennsylvania State University) Department of Finance*. Professor. Mergers and acquisitions, corporate governance, financial institutions.

Jie Cai, PhD *(University of Iowa) Department of Finance*. Associate Professor. Investment banking, mergers and acquisitions, corporate finance and corporate governance.

Thomas Chi-Nan Chiang, PhD *(The Pennsylvania State University) Marshall M. Austin Professor of Finance*. Professor. International finance; time series analysis of financial data; econometric modeling & forecasting; financial markets; international risk management; monetary theory; macroeconomics; emerging markets; and global country funds.

Naveen Daniel, PhD *(Arizona State University)*. Associate Professor. Corporate governance, mutual funds, hedge funds.

Daniel Dorn, PhD *(Columbia University) Department of Finance*. Associate Professor. Capital markets and investments; behavioral finance.

Eliezer M. Fich, PhD *(New York University) Department of Finance*. Professor. Empirical topics in corporate finance.

Michael Gombola, PhD *(University of South Carolina) Department Chair, Finance*. Professor. Stock offerings and repurchases, mergers, acquisitions, and restructuring; working capital management, time series analysis; options and derivatives, financial statement analysis.

Joseph Kalmenovitz, PhD *(New York University)*. Assistant Professor. Financial regulation; corporate finance; law and economics; labor.

Amy Kratchman, MBA *(Drexel University)*. Associate Clinical Professor. Investments; Portfolio Management

Michelle Lowry, PhD *(University of Rochester) TD Bank Endowed Professor*. Professor. Empirical corporate finance, including initial public offerings, mergers, and corporate governance

Edward Nelling, PhD, CFA *(University of Pennsylvania-Wharton) Department Head*. Professor. Investments; corporate finance; real estate finance.

Gregory Nini, PhD *(The Wharton School, University of Pennsylvania)*. Assistant Professor. Creditor control rights, corporate governance, and firm value; insurance economics.

Patricia Robak, PhD *(Lehigh University) Department of Finance*. Clinical Professor. Investments, money and banking, international finance.

Diana Sandberg, MS *(Drexel University)*. Associate Clinical Professor. Portfolio management, derivatives, investment management.

Bradford Sodowick, MBA, MD *(University of Pennsylvania)*. Assistant Clinical Professor. Corporate finance, healthcare finance.

Samuel H. Szewczyk, PhD *(Pennsylvania State University)*. Associate Professor. Corporate governance, mergers and acquisitions, financial engineering, investment banking, financial institutions.

George Tsetsekos, PhD *(The University of Tennessee) Dean Emeritus, LeBow College of Business; Francis Professor of Finance*. Professor. Valuation and corporate restructuring, treasury and risk/hedging

operations, investment banking, securitization, emerging capital markets, multinational finance, bank asset-liability management.

Emeritus Faculty

Ralph Walkling, PhD *(University of Maryland) Stratakis Professor of Corporate Governance, Department of Finance.* Professor Emeritus. Corporate governance, mergers and acquisitions.

Sport Business

Major: Sport Business
Degree Awarded: Bachelor of Science in Business Administration (BSBA)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 31.0504
Standard Occupational Classification (SOC) code:

About the Program

The BSBA in Sport Business is designed for students who plan to pursue careers in the sport industry. The major draws on the strengths of its own offerings and the required business administration core.

Students will master the knowledge and skills necessary for success in professional sports organizations, collegiate athletics, sport media companies, and businesses that service and are complimentary to the sport industry. The co-op option engages students with extensive experiential learning. Our Philadelphia location is optimal for accessing opportunities throughout the Northeast corridor and beyond.

The program offers options covering a wide range of areas of study; students are able to match their skills, abilities, and interests with a specific niche within the sport industry. Students may choose a minor or create their own particular specialization and area of expertise, in consultation with our department's academic advisor and faculty.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Bachelor of Science in Business Administration (BSBA) Degree Requirements

General Education Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COM 270 [WI]	Business Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
PHIL 105	Critical Reasoning	3.0
PSY 101	General Psychology I	3.0
UNIV B101	The Drexel Experience	1.0
UNIV B201 [WI]	Career Management	1.0

English literature elective ENGL 200 through ENGL 399		3.0
Fine Arts elective		3.0
History (HIST) elective		4.0
Select two of the following:		6.0
BIO 100	Applied Cells, Genetics & Physiology	
or BIO 101	Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	

General Education Electives

Students select seven (21.0 credits) general education electives, with a minimum of one course in each of the following three categories. Students take the remaining 12.0 credits from any of the topics listed under Additional General Education Electives.

Society and Culture		
Communication, English, Fine Arts, Global Studies, Language or Philosophy		3.0
Social Science		
Anthropology, History, Sociology, Political Science, Psychology		3.0
Science		
Computer Science, Information Systems, Science		3.0

Additional General Education Electives

Twelve (12.0) credits must be earned by taking 4 courses from the following topics: Communication, English, Fine Arts, Global Studies, Language, Philosophy, Anthropology, History, Sociology, Political Science, Psychology, Computer Science, Information Systems, Math, Science	12.0

Business Requirements

ACCT 115	Financial Accounting Foundations	4.0
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
BUSN 101	Foundations of Business I (Online students take BUSN 111)	4.0
BUSN 102	Foundations of Business II (Online students take BUSN 112)	4.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
INTB 200	International Business	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
MIS 200	Management Information Systems	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 201	Introduction to Business Statistics	4.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
ORGB 420	Negotiations and Conflict Resolution	
STAT 202	Business Statistics II	

Major Requirements

Eight required courses (See Major Requirements list below)		32.0
Free Electives		**18.0**
Total Credits		180.0

Sport Business Major Required Courses		
SMT 110	The Business of Sport	4.0
SMT 201	Sports Marketing, Promotion, and Public Relations	4.0
SMT 230	Sports and the Law	4.0
SMT 285	Sport, Industry, and Society	4.0
SMT 320	Sport Economics	4.0
Sport Major Electives: Select 3 of the following courses		**12.0**
SMT 205	Sport Media Relations	
SMT 220	Recreation, Wellness & Society	
SMT 227	Sport Entrepreneurship	
SMT 240	Olympic Games	
SMT 245	NCAA Compliance	

SMT 250 [WI]	Technology and Sport	
SMT 255	Legal Foundations of Title IX	
SMT 260	Sports Agents & Labor Relations	
SMT 262	Digital Sports Storytelling	
SMT 270	Sports Facility Planning & Management	
SMT 275	Sports Event Management	
SMT 290	Digital Media in Sport	
SMT 305	Fundraising in Sports	
SMT 307	Corporate Sponsorship in Sports	
SMT 310	Sports Contracts	
SMT 321	Money, Power, Politics: College Sports in America	
SMT 325	Business of Sports Media	
SMT 333	Sports Gambling	
SMT 335	Sport Governance & Policy	
SMT 340 [WI]	International Aspects of Sport	
SMT 362	Sport Ticket Sales	
SMT 372	Sport Business Consulting	
SMT 375	Sport Finance	
SMT 380	Sports Analytics	
SMT 475	Sports Industry Practicum	
Total Credits		32.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BUSN 101	Foundations of Business I	4.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV 101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
BUSN 102	Foundations of Business II	4.0

ECON 202	Principles of Macroeconomics	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	15.0
Term 3		
ACCT 115	Financial Accounting Foundations	4.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PSY 101	General Psychology I	3.0
CIVC 101	Introduction to Civic Engagement	1.0
General Education Elective		3.0
Society and culture course		3.0
	Term Credits	17.0
Term 4		
ACCT 116	Managerial Accounting Foundations	4.0
STAT 201	Introduction to Business Statistics	4.0
SMT 110	The Business of Sport	4.0
Select one of the following		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
	Term Credits	15.0
Term 5		
BLAW 201	Business Law I	4.0
INTB 200	International Business	4.0
COM 270 [WI]	Business Communication	3.0
Select one of the following		3.0
BIO 101 or 100	Applied Biological Diversity, Ecology & Evolution Applied Cells, Genetics & Physiology	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
	Term Credits	14.0
Term 6		
FIN 301	Introduction to Finance	4.0
MKTG 201	Introduction to Marketing Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
ENGL 200 Through ENGL 399		3.0
	Term Credits	15.0
Term 7		
MIS 200	Management Information Systems	4.0
OPM 200	Operations Management	4.0
Science or Computer Science elective		3.0
History Elective		4.0
	Term Credits	15.0
Term 8		
PHIL 105	Critical Reasoning	3.0
SMT 285	Sport, Industry, and Society	4.0
Select one of the following		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
MGMT 451	Management Simulation	
STAT 202	Business Statistics II	
Free Electives		4.0
	Term Credits	15.0
Term 9		
SMT 230	Sports and the Law	4.0
SMT 320	Sport Economics	4.0
General Education Elective		3.0

Free Electives		4.0
	Term Credits	15.0
Term 10		
MGMT 450	Strategy and Competitive Advantage	4.0
SMT 201	Sports Marketing, Promotion, and Public Relations	4.0
Fine Arts Elective		3.0
Sport Major Course		4.0
	Term Credits	15.0
Term 11		
Sport Major Course		4.0
UNIV B201 [WI]	Career Management	1.0
General Education Elective		3.0
Social Science Elective		3.0
Free Elective		3.0
	Term Credits	14.0
Term 12		
Sport Major Course		4.0
General Education Elective		3.0
Free Electives		7.0
	Term Credits	14.0

Total Credit: 180.0

Co-op/Career Opportunities

Co-op Opportunities

Drexel University has long been known for its co-operative education programs, through which students combine periods of full-time, career related employment with their studies. Co-op employment for sport business students is central to their experience.

With the BSBA sport business major, co-operative education gives students experience in a range of sport related jobs and settings. Students may be placed with professional athletic teams, university athletics and recreation programs, or with organizations aligned with sports (e.g., a sports agency). Co-op experiences are available with many of the region's sports, organizations, including professional sports teams, college athletic departments, law firms, and sports agencies, sports media networks, non-profit organizations, youth organizations, sports complexes, and others.

Career Opportunities

The multidisciplinary nature of the sport business program allows its graduates to be ready for a wide range of sport-related professions, including athletic management, the sport industry at all levels (professional, semi-professional, collegiate) within a range of organizations (public, private, professional, and amateur).

Sport business graduates are uniquely qualified for leadership, or support positions in professional and amateur sports organizations, college sports, and in other sports venues. The program also prepares students for graduate or professional study in a variety of fields including sport management, law, and business.

Facilities

In fall 2013, LeBow College opened its 12-story, Gerri C. LeBow Hall, with a finance trading lab, behavioral studies lab and integrated teaching technology in all classrooms. The new building features two lecture halls, 15 classrooms of varying sizes and seating configurations, including case study rooms and cluster classrooms designed to facilitate group work. Other amenities consist of extensive areas of student spaces, including 19 collaboration rooms, two quiet study areas, and 3,500 square feet of student lounges. Gerri C. LeBow Hall brings together faculty, students and staff, in a state of the art building on the University City campus. Please visit the LeBow College of Business webpage (http://www.lebow.drexel.edu/about/campuses/philadelphia/location/gerri-c-lebow-hall/) to learn more about Gerri C. LeBow Hall.

Sport Business Faculty

Lawrence Cohen, JD *(Temple University)*. Associate Teaching Professor. Sports and antitrust law; tickets & sales data analytics; sport sponsorship.

Jeffrey Levine, JD *(University of Louisville, Tulane University)*. Assistant Clinical Professor. Sport law, sport development and policy; non-profits in sport.

Joel Maxcy, PhD *(Washington State University) Department Head Sport Management & General Business*. Professor. Economics of sport; labor economics & policy; economics of antitrust & regulation.

Technology Innovation Management

Co-Major: Technology Innovation Management
Degree Awarded: Bachelor of Science in Business Administration (BSBA)
Calendar Type: Quarter
Total Credit Hours: 186.0
Classification of Instructional Programs (CIP) code: 52.1201
Standard Occupational Classification (SOC) code: 11-3021; 15-1131

The Technology Innovation Management program is a co-major that must be taken in conjunction with the following majors Accounting, Finance, International Business, Legal Studies, Management Information Systems, Marketing or Operations and Supply Chain Management.

About the Program

Technology and Innovation Management is a unique and exciting area within the broad field of management. The field focuses broadly on understanding the process of innovation, and management approaches to innovation with special emphasis on technology change as a source of innovations.

The Technology Innovation Management program offers a very significant way of differentiating the Drexel business student in the marketplace by embedding skill sets and knowledge base emphasizing technology innovation management which is built on a solid business background. Technology Innovation Management courses are oriented primarily toward innovation, with an emphasis on technology-based innovation.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Bachelor of Science in Business Administration (BSBA) Degree Requirements

General Education Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COM 270 [WI]	Business Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	

ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
PHIL 105	Critical Reasoning	3.0
PSY 101	General Psychology I	3.0
UNIV B101	The Drexel Experience	1.0
UNIV B201 [WI]	Career Management	1.0
English literature elective ENGL 200 through ENGL 399		3.0
Fine Arts elective		3.0
History (HIST) elective		4.0
Select two of the following:		6.0
BIO 100	Applied Cells, Genetics & Physiology	
or BIO 101	Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	

General Education Electives

Students select seven (21.0 credits) general education electives, with a minimum of one course in each of the following three categories. Students take the remaining 12.0 credits from any of the topics listed under Additional General Education Electives.

Society and Culture

Communication, English, Fine Arts, Global Studies, Language or Philosophy	3.0

Social Science

Anthropology, History, Sociology, Political Science, Psychology	3.0

Science

Computer Science, Information Systems, Science	3.0

Additional General Education Electives

Twelve (12.0) credits must be earned by taking 4 courses from the following topics: Communication, English, Fine Arts, Global Studies, Language, Philosophy, Anthropology, History, Sociology, Political Science, Psychology, Computer Science, Information Systems, Math, Science	12.0

Business Requirements

ACCT 115	Financial Accounting Foundations	4.0
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
BUSN 101	Foundations of Business I (Online students take BUSN 111)	4.0
BUSN 102	Foundations of Business II (Online students take BUSN 112)	4.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
INTB 200	International Business	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
MIS 200	Management Information Systems	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 201	Introduction to Business Statistics	4.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
ORGB 420	Negotiations and Conflict Resolution	
STAT 202	Business Statistics II	

Major Requirements

Eight required courses (See Major Requirements list below)	32.0
Free Electives	**18.0**
Total Credits	180.0

Required Courses:

MGMT 201	Introduction to Technology Innovation Management	4.0
MGMT 301	Designing Innovative Organizations	4.0
MGMT 302	Competing in Technology Industries	4.0
MGMT 364	Technology Management	4.0
Select two courses from either track:		**8.0**
Product Innovation Track		
BLAW 360	Intellectual Property and Cyber Law	
MGMT 250	Masters of Management and the Origins of Wealth	
MGMT 370	For-Profit Business Consulting	
MKTG 347	New Product Development	
MKTG 355	Interactive Marketing	
MKTG 357	Global Marketing	
MKTG 365	Digital Marketing	
ORGB 400	Team Development and Leadership	
ORGB 420	Negotiations and Conflict Resolution	
Process Innovation Track		
MGMT 370	For-Profit Business Consulting	
MIS 261	Introduction to Enterprise Application Software Using SAP - Logistics	
MIS 262	Intro to Enterprise Application Software Using SAP - Accounting & Analytics	
MIS 361	Information System Project Management	
OPM 315	Service Operations Management	
OPM 321	Planning and Control of Operations	
STAT 325	Six-Sigma Quality Implementation	
Total Credits		24.0

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BUSN 101	Foundations of Business I	4.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV B101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
BUSN 102	Foundations of Business II	4.0
ECON 202	Principles of Macroeconomics	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	15.0
Term 3		
ACCT 115	Financial Accounting Foundations	4.0
BIO 100, 101, CHEM 151, or PHYS 151	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution Applied Chemistry Applied Physics	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PSY 101	General Psychology I	3.0
General Education elective		3.0
	Term Credits	17.0
Term 4		

Course	Title	Credits
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
COM 270 [WI]	Business Communication	3.0
STAT 201	Introduction to Business Statistics	4.0
	Term Credits	15.0
Term 5		
BIO 100, 101, CHEM 151, or PHYS 151	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution Applied Chemistry Applied Physics	3.0
INTB 200	International Business	4.0
MIS 200	Management Information Systems	4.0
Social Science elective		3.0
	Term Credits	14.0
Term 6		
FIN 301	Introduction to Finance	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
English Literature elective ENGL 200 through ENGL 399		3.0
	Term Credits	15.0
Term 7		
MGMT 201	Introduction to Technology Innovation Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
PHIL 105	Critical Reasoning	3.0
Primary Major Couse 1		4.0
	Term Credits	15.0
Term 8		
MGMT 301	Designing Innovative Organizations	4.0
Primary Major course 2		4.0
Primary Major course 3		4.0
HIST elective		4.0
	Term Credits	16.0
Term 9		
MGMT 302	Competing in Technology Industries	4.0
Primary Major course 4		4.0
Primary Major course 5		4.0
Society and Culture elective		3.0
	Term Credits	15.0
Term 10		
MGMT 364	Technology Management	4.0
UNIV B201 [WI]	Career Management	1.0
Primary Major course 6		4.0
Fine Arts elective		3.0
General Education elective		3.0
	Term Credits	15.0
Term 11		
MGMT 450	Strategy and Competitive Advantage	4.0
Primary Major course 7		4.0
Science or Computer Science electie		3.0
Select course from Product Innovation or Process Innovation Track		4.0
	Term Credits	15.0
Term 12		
MGMT 260, 370, 371, ORGB 420, or STAT 202	Introduction to Entrepreneurship For-Profit Business Consulting Nonprofit Business Consulting Negotiations and Conflict Resolution Business Statistics II	4.0
Primary Major course 8		4.0
General Education electives		6.0
Select course from Track chosen in Term 11		4.0
	Term Credits	18.0

Total Credit: 186.0

Facilities

In fall 2013, LeBow College opened its 12-story, Gerri C. LeBow Hall, with a finance trading lab, behavioral studies lab and integrated teaching technology in all classrooms. The new building features two lecture halls, 15 classrooms of varying sizes and seating configurations, including case study rooms and cluster classrooms designed to facilitate group work. Other amenities consist of extensive areas of student spaces, including 19 collaboration rooms, two quiet study areas, and 3,500 square feet of student lounges. Gerri C. LeBow Hall brings together faculty, students and staff, in a state of the art building on the University City campus. Please visit the LeBow College of Business webpage (http://www.lebow.drexel.edu/about/campuses/philadelphia/location/gerri-c-lebow-hall/) to learn more about Gerri C. LeBow Hall.

Co-Op/Career Opportunities

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities. To learn more about career opportunities and resources see the Career Guides (http://drexel.edu/scdc/career-services/counseling/career-guides/) provided by the Steinbright Career Development Center.

Technology Innovation Management Faculty

Daniel Albert, PhD *(University of St. Gallen)*. Assistant Professor. Strategic Management; Strategic Change; Architectural Innovation; Organizational Design.

Suresh Chandran, PhD *(Vanderbilt University)*. Clinical Professor. Corporate entrepreneurship; corporate social responsibility; global management; intellectual property and employee rights; Sustainability; Technological Innovation.

Robert W. Keidel, PhD *(Wharton School, University of Pennsylvania)*. Clinical Professor. Cognitive coaching; Executive team building; Organizational design; Strategic thinking; Strategy creation

Jeongsik Lee, PhD *(University of California Los Angeles)*. Assistant Professor. Economics of Innovation; Social networks; Technology management

Yu-Chieh Lo, PhD *(University of Southern California)*. Associate Professor. Categorization in markets; Organization theory; Technology innovation.

Dali Ma, PhD *(University of Chicago)*. Associate Professor. Social hierarchy; Social networks; Sociology of entrepreneurship; Sociology of transitional China

Jacob Miller, PhD *(Drexel University)*. Assistant Clinical Professor. Open software; Innovation; Semantic analysis.

Rajiv Nag, PhD *(Pennsylvania State University)*. Clinical Professor. Organizational Knowledge and Identity; Organizational learning and change; Strategic Leadership; Strategic Performativity

V. K. Narayanan, PhD *(University of Pittsburgh)*. Delloitte Touche Jones Stubbs Professor. Cognition and Strategy; Corporate Entrepreneurship; Organization design

Stanley Ridgley, PhD *(Duke University)*. Associate Clinical Professor. Business communication; Cognition and strategy; Competitive

intelligence; Determinants of Firm Performance; Global Management; New Markets in Emerging Countries; Russian Business Culture.

Daniel Tzabbar, PhD *(University of Toronto)*. Associate Professor. Accessing and managing knowledge; Alliances; Human capital; Organizational learning and change; Social Capital; Technology Entrepreneurship; Technology Innovation

Minor in Accounting

About the Minor

The minor in Accounting is designed for students with varied backgrounds who seek to develop knowledge and skills in accounting fundamentals. These accounting management skills are intended to supplement other majors from around the university.

Requirements

- No more than 2 courses or 8.0 credits required by a student's major may be counted towards this minor.
- A grade of "C" (2.0) or better must be earned for each course in this minor for it to be counted.
- No more than two transfer courses may be used to complete this minor. Transfer credits must be taken before matriculated at Drexel.
- Students should check the pre-requisites of all classes when selecting electives. It is the responsibility of the student to know pre-requisites.
- Business administration, business & engineering and economic students may complete any of the business minors, including: economics, finance, international economics, legal studies, management information systems, marketing, business analytics, organizational management, technology innovation management, and operations & supply chain management.
- **Cannot do a major and a minor in the same field of study.**

All prospective students should meet with an advisor from the College as soon as possible. Call 215.895.2110 to set up an appointment.

Program Requirements

Required Courses

ACCT 115	Financial Accounting Foundations	4.0
ACCT 116	Managerial Accounting Foundations	4.0
ACCT 321	Financial Reporting I	4.0
ACCT 322	Financial Reporting II	4.0
ACCT 323	Financial Reporting III	4.0
Select one (1) of the following:		4.0
ACCT 331	Cost Accounting	
ACCT 341	Principles of Auditing	
TAX 341	Individual Income Taxes	
Total Credits		24.0

Minor in Business Administration

About the Minor

The minor in business administration is designed to provide some flexibility while at the same time assuring exposure to a number of critical business functional areas.

Requirements

- No more than 2 courses or 8.0 credits required by a student's major may be counted towards this minor.
- A grade of "C" (2.0) or better must be earned for each course in this minor for it to be counted.
- No more than two transfer courses may be used to complete this minor. Transfer credits must be taken before matriculation at Drexel.
- Students should check the pre-requisites of all classes when selecting electives. It is the responsibility of the student to know pre-requisites.
- Business administration and business & engineering & economic students may complete any of the business minors, including: accounting, economics, finance, international economics, legal studies, management information systems, marketing, business analytics, organizational management, technology innovation management, and operations & supply chain management.
- **Cannot do a major and a minor in the same field of study.**

All prospective students should meet with an advisor from the College as soon as possible. Call 215.895.2110 to set up an appointment.

Students select six of the following:		24.0
ACCT 115	Financial Accounting Foundations	
or ACCT 11	Accounting for Professionals	
BLAW 201	Business Law I	
or BLAW 32	Law of Business Organizations	
ECON 201	Principles of Microeconomics	
ECON 202	Principles of Macroeconomics	
FIN 301	Introduction to Finance	
MIS 200	Management Information Systems	
MKTG 201	Introduction to Marketing Management	
OPM 200	Operations Management	
ORGB 300 [WI]	Organizational Behavior	
STAT 201	Introduction to Business Statistics	
STAT 202	Business Statistics II	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Business Analytics

About the Minor

How does a company design an effective social media campaign for its brand new product? How does a bank make credit card offers or detect fraud? How does a chain store stock its shelves with just the right products at the right price? Technology has made it possible to collect, store, process and analyze massive data sets that can help businesses make better decisions. However, there remains a gap that can only be filled by those with a background in business analytics. From the junior analyst providing daily reports on production to the CEO seeking to transform his or her business, all are looking for guidance and talent in business analytics.

LeBow students are uniquely positioned to address descriptive, diagnostic, predictive, prescriptive and pre-emptive questions across the business analytics lifecycle from the corporate generation of data through the application and impact on managerial and leadership decision-making and innovation.

Ranked second in a Computerworld survey on the most difficult skills to find, Business Analytics expertise is not only scarce, but in demand. McKinsey Global Institute reports that the United States could face a shortage of between 140,000 and 190,000 individuals who possess Business Analytics skills and an additional 1.5 million managers with the skills to implement the results.

The Business Analytics minor at LeBow consists of basic courses in statistics, operations research, and management information systems as well as advanced courses in management information systems, statistics/econometrics, and modeling. The curriculum enables students to tailor the program to their interests and anticipated career path.

One of the distinguishing features of the business analytics minor is the required senior project (BSAN 460) where students work in small teams on real business analytics projects from LeBow College's corporate partners. The projects require students to bring together all the key elements of the business analytics curriculum to derive business insights for a company's current business challenges. Experiencing this data driven decision making process is invaluable career preparation.

Requirements

- No more than 2 courses or 8.0 credits required by a student's major may be counted towards this minor.
- A grade of "C" (2.0) or better must be earned for each course in this minor for it to be counted.
- No more than two transfer courses may be used to complete this minor. Transfer credits must be taken before matriculated at Drexel.
- Students should check the pre-requisites of all classes when selecting electives. It is the responsibility of the student to know pre-requisites.
- Business administration, business & engineering and economic students may complete any of the business minors, including: economics, finance, international economics, legal studies, management information systems, marketing, organizational management, technology innovation management, and operations & supply chain management.
- **Cannot do a major and a minor in the same field of study.**

All prospective students should meet with an advisor from the College as soon as possible. Call 215.895.2110 to set up an appointment.

BSAN 260	Introduction to Business Analytics	4.0
BSAN 360	Programming for Data Analytics	4.0
or MIS 349	Predictive Business Analytics with Relational Database Data	
BSAN 460	Business Analytics Senior Project	4.0
MIS 343	Database Design and Implementation	4.0
Business Analytics electives (select two of the following):		**8.0**
BSAN 360	Programming for Data Analytics	
ECON 301	Microeconomics	
ECON 350 [WI]	Applied Econometrics	
ECON 360	Time Series Econometrics	
MIS 342	Systems Analysis and Design	
MIS 349	Predictive Business Analytics with Relational Database Data	
MIS 361	Information System Project Management	
MKTG 326	Marketing Insights	
MKTG 366	Customer Analytics	
MKTG 367	Data-Driven Digital Marketing	
OPR 320	Linear Models for Decision Making	
OPR 330	Advanced Decision Making and Simulation	
OPR 340	Decision Models for the Public Sector	
OPR 350	Optimization in Finance	
STAT 331	Introduction to Data Mining for Business	
STAT 335	Introduction to Experimental Design	
Total Credits		24.0

* The following groupings of courses are recommended by departments for their respective career pathways. Students are strongly encouraged to complete three courses for at least one career pathway, based on their other major(s) and career goals.

Accounting:
STAT 331: Introduction to Data Mining for Business
MIS 342: Systems Analysis and Design
OPR 320: Linear Models for Decision Making

Economics:
ECON 301: Microeconomics
ECON 350 [WI] : Applied Econometrics
ECON 360: Time Series Econometrics
STAT 331: Introduction to Data Mining for Business
MKTG 366: Customer Analytics
MKTG 367: Data-Driven Digital Marketing
Complete one of the following courses:
BSAN 360: Programming for Business Analytics (R)
MIS 349: Predictive Analytics (SAS)

Finance: OPR 350
ECON 350 [WI] : Applied Econometrics
ECON 360: Time Series Econometrics
STAT 331: Introduction to Data Mining for Business
OPR 320: Linear Models for Decision Making

Management Information Systems:
MIS 342: Systems Analysis and Design
MIS 361: Information System Project Management

Marketing: (Even though only three will be counted toward the BA co-major/minor, we recommend that the students use their primary major or free business electives to complete all of the courses below in order to develop a solid foundation. Note that MKTG 366 and STAT 331 employ similar techniques and MKTG 367 and STAT 335 employ similar techniques.)
MKTG 326: Marketing Insights
MKTG 366: Customer Analytics
MKTG 367: Data-Driven Digital Marketing
STAT 331: Data Mining
STAT 335: Introduction to Experimental Design

Operations and Supply Chain Management:
ECON 350 [WI] : Applied Econometrics
ECON 360: Time Series Econometrics
STAT 331: Introduction to Data Mining for Business
STAT 335: Introduction to Experimental Design
MIS 342: Systems Analysis and Design
OPR 320: Linear Models for Decision Making
OPR 330: Advanced Decision Making and Simulation
OPR 340: Decision Models for the Public Sector
MKTG 366: Customer Analytics
MKTG 367: Data-Driven Digital Marketing

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Business Consulting

About the Minor

The Business Consulting minor is designed to equip students with practical skills and competencies through project-based coursework and industry collaboration.

Students will complete at least half of their degree requirements in experiential learning courses. In these courses, students work in interdisciplinary teams to provide business solutions to organizations across industries.

Through elective courses, students can focus in areas such as organizational behavior, management information systems, and international business.

Admission Requirements

Open to any undergraduate student enrolled at the university.

Program Requirements

Required Courses		
MGMT 370	For-Profit Business Consulting	4.0
MGMT 371	Nonprofit Business Consulting	4.0
MGMT 372	Startup Business Consulting	4.0
Business Consulting Electives (select three of the following)		**12.0**
MGMT 301	Designing Innovative Organizations	
MGMT 364	Technology Management	
MGMT 380	International Business Consulting	
MIS 342	Systems Analysis and Design	
MIS 347	Domestic and Global Outsourcing Management	
MIS 361	Information System Project Management	
ORGB 320	Leadership: Theory and Practice	
ORGB 400	Team Development and Leadership	
ORGB 420	Negotiations and Conflict Resolution	
Total Credits		24.0

Minor in Finance

About the Minor

A minor in finance develops students' ability to allocate funds to their highest valued use. This minor provides a basic understanding of how businesses raise and invest capital, how individuals allocate their savings and invest and how markets function to support businesses.

Requirements

- No more than 2 courses or 8.0 credits required by a student's major may be counted towards this minor.

- A grade of "C" (2.0) or better must be earned for each course in this minor for it to be counted.
- No more than two transfer courses may be used to complete this minor. Transfer credits must be taken before matriculated at Drexel.
- Students should check the pre-requisites of all classes when selecting electives. It is the responsibility of the student to know pre-requisites.
- Business administration, business & engineering and economic students may complete any of the business minors, including: accounting, economics, international economics, legal studies, management information systems, marketing, business analytics, organizational management, technology innovation management, and operations & supply chain management.
- **Students cannot do a major and a minor in the same field of study**.

All core mathematics and statistics courses should be completed before embarking on the upper-level finance minor courses. A second course in business statistics, STAT 202, with a minimum grade of C, must be completed as a prerequisite for the minor's required courses.

Program Requirements

Required Courses

ACCT 115	Financial Accounting Foundations	4.0
or ACCT 110	Accounting for Professionals	
ACCT 116	Managerial Accounting Foundations	4.0
FIN 301	Introduction to Finance	4.0
FIN 302	Intermediate Corporate Finance	4.0
FIN 321	Investment Securities & Markets	4.0
FIN 325	Financial Institutions and Markets	4.0
Total Credits		24.0

Additional Information

All prospective students should meet with an advisor from the College as soon as possible. Call 215.895.2110 to set up an appointment. Prospective students may also consult with the Finance Department (http://www.lebow.drexel.edu/academics/undergraduate/majors/finance/).

Minor in Legal Studies

About the Minor

- No more than 2 courses or 8.0 credits required by a student's major may be counted towards this minor.
- A grade of "C" (2.0) or better must be earned for each course in this minor for it to be counted.
- No more than two transfer courses may be used to complete this minor. Transfer credits must be taken before matriculated at Drexel.
- Students should check the pre-requisites of all classes when selecting electives. It is the responsibility of the student to know pre-requisites.
- Business administration, business & engineering and economic students may complete any of the business minors, including: accounting, economics, finance, international economics, management information systems, marketing, business analytics, organizational management, technology innovation management, and operations & supply chain management.
- **Cannot do a major and a minor in the same field of study.**

All prospective students should meet with an advisor from the College as soon as possible. Call 215.895.2110 to set up an appointment.

Program Requirements

Requirements

BLAW 201	Business Law I	4.0
Select five of the following:		20.0
BLAW 202	Business Law II	
BLAW 321	Law of Business Organizations	
BLAW 330	Real Estate	
BLAW 334	Labor Law	
BLAW 338	Government Regulation and Business	
BLAW 340	International Business Law	
BLAW 342	Criminal Law	
BLAW 346	Entrepreneurial Law	
BLAW 348	White Collar Crime	
BLAW 356	Legal Issues in Corporate Governance	
BLAW 358	Employment Law	
BLAW 360	Intellectual Property and Cyber Law	
Total Credits		24.0

Minor in Management Information Systems

About the Minor

Requirements

- No more than 2 courses or 8.0 credits required by a student's major may be counted towards this minor.
- A grade of "C" (2.0) or better must be earned for each course in this minor for it to be counted.
- No more than two transfer courses may be used to complete this minor. Transfer credits must be taken before matriculated at Drexel.
- Students should check the pre-requisites of all classes when selecting electives. It is the responsibility of the student to know pre-requisites.
- Business administration, business & engineering and economic students may complete any of the business minors, including: accounting, economics, finance, international economics, legal studies, marketing, business analytics, organizational management, technology innovation management, and operations & supply chain management.
- **Cannot do a major and a minor in the same field of study.**

All prospective students should meet with an advisor from the College as soon as possible. Call 215.895.2110 to set up an appointment.

Required Courses

MIS 200	Management Information Systems	4.0
MIS 342	Systems Analysis and Design	4.0
MIS 343	Database Design and Implementation	4.0
MIS 346	Management Information Systems Strategy	4.0
MIS 347	Domestic and Global Outsourcing Management	4.0
MIS 348	Visual Basic Database Programming for Business	4.0
Total Credits		24.0

Minor in Marketing

About the Minor

Marketing is one of the most dynamic areas of business because it focuses on satisfying the ever-changing wants and needs of people. Since it involves the creation of value for customers, as well as the

acquisition and retention of customers, this minor is appropriate in combination with a myriad of business and non-business majors including, but not limited to International Business, Business Analytics, Finance, Management, Management Information Systems, Entrepreneurship, Economics, Legal Studies, Engineering, Design and Merchandising, Fashion Design, Product Design, Interior Design, Music Industry, Film and Video, Communications, Hospitality Management, and Psychology.

Requirements

- No more than 2 courses or 8.0 credits required by a student's major may be counted towards this minor.
- A grade of "C" (2.0) or better must be earned for each course in this minor for it to be counted.
- No more than two transfer courses may be used to complete this minor. Transfer credits must be taken before matriculated at Drexel.
- Students should check the pre-requisites of all classes when selecting electives. It is the responsibility of the student to know pre-requisites.
- **Cannot do a major and a minor in the same field of study.**

All prospective students should meet with an advisor from the College as soon as possible. Call 215.895.2110 to set up an appointment.

Requirements

MKTG 201	Introduction to Marketing Management	4.0
MKTG 380	Seminar in Marketing Strategy	4.0
Select four of the following:		16.0
MKTG 321	Selling and Sales Management	
MKTG 322	Advertising & Integrated Marketing Communications	
MKTG 324	Marketing Channels and Distribution Systems	
MKTG 326	Marketing Insights	
MKTG 344	Professional Personal Selling	
MKTG 347	New Product Development	
MKTG 348	Services Marketing	
MKTG 351	Marketing for Non-Profit Organizations	
MKTG 355	Interactive Marketing	
MKTG 356	Consumer Behavior	
MKTG 357	Global Marketing	
MKTG 362	Brand and Reputation Management	
MKTG 364	Marketing for New Ventures	
MKTG 365	Digital Marketing	
MKTG 366	Customer Analytics	
Total Credits		24.0

Minor in Operations and Supply Chain Management

About the Minor

The minor in operations and supply chain management is designed to prepare students for eventual participation as managers or specialists in the operations activity of industrial and service systems. Today, companies worldwide are competing in very different ways and very different environments than they were in the past because of technological advances. Operations, Supply Chain Management, and Logistics are key functions through which companies can gain strategic advantage, and companies are hiring graduates to drive innovations for their new economic surroundings. In this minor, courses drawing on the foundations and the state-of-the-art for both production and service industries allow students to craft a course of study that can complement their existing major.

Requirements

- No more than 2 courses or 8.0 credits required by a student's major may be counted towards this minor.
- A grade of "C" (2.0) or better must be earned for each course in this minor for it to be counted.
- No more than two transfer courses may be used to complete this minor. Transfer credits must be taken before matriculated at Drexel.
- Students should check the prerequisites of all classes when selecting electives. It is the responsibility of the student to know prerequisites.
- Business administration and business & engineering & economic students may complete any of the business minors, including: accounting, economics, finance, international economics, legal studies, management information systems, marketing, business analytics, organizational management and technology innovation management.
- **Cannot do a major and a minor in the same field of study.**

All prospective students should meet with an advisor from the College as soon as possible. Call 215.895.2110 to set up an appointment.

Program Requirements

Required Courses

OPM 321	Planning and Control of Operations	4.0
OPR 320	Linear Models for Decision Making	4.0
Select four of the following:		16.0
MGMT 301	Designing Innovative Organizations	
MGMT 364	Technology Management	
OPM 200	Operations Management	
OPM 315	Service Operations Management	
OPM 325	Advanced Planning and Control of Operations	
OPM 341	Supply Chain Management	
OPM 342	Sustainable Supply Chain Management and Logistics	
OPM 343	Managing Queues for Service Operations	
OPM 344	Revenue Management	
OPM 399	Operations & Supply Chain Management Industry Project	
OPR 330	Advanced Decision Making and Simulation	
OPR 340	Decision Models for the Public Sector	
STAT 325	Six-Sigma Quality Implementation	
Total Credits		24.0

Additional Information

For additional information about the program, students should contact the Department of Decision Sciences (http://www.lebow.drexel.edu/Faculty/Departments/Decision/).

Minor in Organizational Management

About the Minor

The minor in "Organizational Management" is designed for students with varied backgrounds who seek to develop knowledge and skills in leadership, teamwork, and communication. These organizational management skills are intended to supplement other majors from around the university. The curriculum provides students with a foundation of skills for effectively working with others in a variety of contexts and situations.

Requirements

- No more than 2 courses or 8.0 credits required by a student's major may be counted towards this minor.
- A grade of "C" (2.0) or better must be earned for each course in this minor for it to be counted.
- No more than two transfer courses may be used to complete this minor. Transfer credits must be taken before matriculated at Drexel.
- Students should check the pre-requisites of all classes when selecting electives. It is the responsibility of the student to know pre-requisites.
- Business & engineering and economic students may complete any of the business minors, including: accounting, economics, finance, international economics, legal studies, management information systems, marketing, business analytics, technology innovation management, organizational management and operations & supply chain management.
- **Cannot do a major and a minor in the same field of study.**

Required Courses

ORGB 300 [WI]	Organizational Behavior	4.0
ORGB 320	Leadership: Theory and Practice	4.0
ORGB 400	Team Development and Leadership	4.0
ORGB 420	Negotiations and Conflict Resolution	4.0
Select two of the following courses:		**8.0**
HRMT 323	Principles of Human Resource Administration	
ORGB 430	Strategic Career Development	
MGMT 364	Technology Management	
MGMT 370	For-Profit Business Consulting	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Learning Goals

Upon completing the minor, students will be able to:

- Discover important insights about oneself as a leader and develop a self-awareness of strengths and opportunities for personal growth
- Manage career and networks to achieve personal growth
- Develop the skills and competencies needed to lead effectively in today's dynamic and diverse environment

- Increase conceptual understanding of leadership in different types of situations and facing different types of challenges
- Learn how to influence and manage conflict within organizations
- Identify various approaches and imperatives for leading teams
- Recognize ethical dilemmas in management practice and how to infuse ethical standards within a group or team
- Learn how to effectively function within a team and lead a team for success
- Recognize how human factors can both distort and enhance the process of managerial decision making
- Understand how the changing nature of work (e.g., global, technological, etc.) influences choices about design and practices within organizations

Minor in Real Estate Management and Development

About the Minor

A minor in Real Estate Management & Development (REMD) is designed to prepare students to engage, analyze, and synthesize investment real estate property portfolios from a comprehensive operational perspective. Students who successfully complete the REMD Minor will be able to approach the built environment with a holistic view. The REMD Minor is open to all undergraduate students across the University.

Program Requirements

REQUIRED COURSES

BLAW 330	Real Estate	4.0
FIN 301	Introduction to Finance	4.0
REMD 110	Introduction to Real Estate Management	4.0
REMD 320	Sustainability in the Built Environment	4.0
REMD 375	Real Estate Finance	4.0
REMD 410	Real Estate Investment and Asset Management	4.0
Total Credits		24.0

Minor in Sport Management

About the Minor

The minor in sport business is designed to introduce students to the primary areas of study in the sport industry. Students will be exposed to a variety of perspectives for assessing the sports business.

SMT 110	The Business of Sport	4.0
SMT 201	Sports Marketing, Promotion, and Public Relations	4.0
SMT 285	Sport, Industry, and Society	4.0
SMT 230	Sports and the Law	4.0
SMT 320	Sport Economics	4.0
Choose a minimum of 4.0 credits from the following		**4.0-6.0**
SMT 205	Sport Media Relations	
SMT 270	Sports Facility Planning & Management	
SMT 275	Sports Event Management	
SMT 290	Digital Media in Sport	
SMT 335	Sport Governance & Policy	
SMT 340 [WI]	International Aspects of Sport	
SMT 380	Sports Analytics	
Total Credits		24.0-26.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Technology Innovation Management

About the Minor

The minor in Technology Innovation is designed for students with varied backgrounds who seek to develop knowledge and skills in innovation process and strategic approaches to technology. These technology innovation management skills are intended to supplement other majors from around the university.

- No more than 2 courses or 8.0 credits required by a student's major may be counted towards this minor.
- A grade of "C" (2.0) or better must be earned for each course in this minor for it to be counted.
- No more than two transfer courses may be used to complete this minor. Transfer credits must be taken before matriculated at Drexel.
- Students should check the pre-requisites of all classes when selecting electives. It is the responsibility of the student to know pre-requisites.
- Business & engineering and economic students may complete any of the business minors, including: accounting, economics, finance, international economics, international business, legal studies, management information systems, marketing, business analytics, organizational management, and operations & supply chain management.
- **Cannot do a major and a minor in the same field of study.**

Required Courses

MGMT 201	Introduction to Technology Innovation Management	4.0
MGMT 301	Designing Innovative Organizations	4.0
MGMT 302	Competing in Technology Industries	4.0
MGMT 364	Technology Management	4.0
Select 2 courses from either track:		**8.0**
Product Innovation Track		
BLAW 360	Intellectual Property and Cyber Law	
FIN 335	Entrepreneurial Finance	
MGMT 250	Masters of Management and the Origins of Wealth	
MGMT 370	For-Profit Business Consulting	
MKTG 347	New Product Development	
MKTG 355	Interactive Marketing	
MKTG 357	Global Marketing	
MKTG 365	Digital Marketing	
ORGB 400	Team Development and Leadership	
ORGB 420	Negotiations and Conflict Resolution	
Process Innovation Track		
MGMT 370	For-Profit Business Consulting	
MIS 350	Intro to Enterprise Application Software Using SAP - Accounting & Analytics	
MIS 361	Information System Project Management	
OPM 315	Service Operations Management	
OPM 321	Planning and Control of Operations	
STAT 325	Six-Sigma Quality Implementation	
Total Credits		24.0

Certificate in Brand and Reputation Management

Certificate Level: Undergraduate
Admission Requirements: Current Drexel students only
Certificate Type: Certificate
Number of Credits to Completion: 16.0
Instructional Delivery: Campus
Calendar Type: Quarter
Expected Time to Completion: 3 years
Classification of Instructional Program (CIP) Code: 52.1499
Standard Occupational Classification (SOC) Code: 11-2021

In the increasingly competitive and volatile global marketplace, brand and reputation management have gained considerable interest and importance in organizations, including corporations, non-profits, and those in the public sector.

The Brand and Reputation Management Certificate program introduces the concept of the product and/or corporate brand, the components that make up a good brand, and how to develop brand strategies that are appropriate for various types of organizations. Students will also learn about the various stakeholders that impact or enhance an organization's ability to build its brand and reputation as well as learn to analyze the business environment in order to identify a desired image, to create brand positioning strategy, and to develop and nurture the positive perception of a product, organization, individual or place.

Following the completion of all other required courses, all students must also complete an "honors" project as part of MKTG 363 *Brand & Reputation Management Project*. The topic and scope of the project must be approved by the Department Head in the Department of Marketing (http://www.lebow.drexel.edu/faculty-and-research/disciplines/marketing/). Completed projects will be a written project submitted to the Department Head of Marketing for evaluation in a pass/fail manner.

Program Requirements

COM 181	Public Relations Principles and Theory	3.0
MKTG 322	Advertising & Integrated Marketing Communications	4.0
MKTG 362	Brand and Reputation Management	4.0
MKTG 363	Brand & Reputation Management Project [*]	1.0
Students must complete one course from the following options, depending upon career interests:		4.0
MKTG 324	Marketing Channels and Distribution Systems	
MKTG 347	New Product Development	

MKTG 348	Services Marketing	
MKTG 356	Consumer Behavior	
Or a course from outside the LeBow College in a related field, with the approval of the Department Head in the department of Marketing.		

Total Credits	16.0

*   Taken upon the completion of all other requirements.

Certificate in Social Responsibility in Business

Through course work, civic engagement and related co-op experience, the Certificate in Social Responsibility in Business provides a well-rounded look at corporate social responsibility, giving students a unique perspective on ethical leadership in the business community. The certificate program, open only to currently enrolled Drexel University students, encourages students to seek co-op experience and positions after graduation with firms committed to acting with social responsibly.

Program Requirements

In conjunction with the Lindy Center for Civic Engagement, (http://drexel.edu/lindycenter/) students initiate and complete a socially focused winter break or spring break project during any one term/break. The scope of the project entails civic responsibility and focuses on business applications. An example would be to assist in the preparation of income tax forms for under privileged Philadelphia residents. This project is in addition to requirements of the University 101 course.

Student will use their My LIFE e-portfolios to retain reflections and relevant writings from each of the required courses.

Coordinated with the Center for Civic Engagement, students will complete a minimum of sixty hours (60) of civic engagement while a student at Drexel University.

Students are required to earn a minimum of "C" in the following required courses, and a "B" average over all the courses.

Required Courses [*]		
BUSN 103	Advanced First Year Business Seminar [*]	2.0
ENTP 270	Social Entrepreneurship	3.0
MKTG 368	Corporate Responsibility Management	4.0
ORGB 320	Leadership: Theory and Practice	4.0
PHIL 301	Business Ethics	3.0
Total Credits		16.0

*   Students must take BUSN 103 Social Responsibility in Business.

LeBow College of Business: School of Economics

Economics is one of Drexel LeBow's strongest disciplines. The LeBow College of Business celebrated its strengths in economics teaching and research by elevating its economics department into a School of Economics. The School of Economics will continue Drexel LeBow's commitment to offering a curriculum that is current and challenging, and to conducting research that aligns with business trends and informs policy makers.

A degree, major or minor in Economics provides students with a robust understanding of the workings of the market system and major economic institutions, economic policy, and development.

Majors

BA, BS, BS-JD Economics

- Economics (BA, BS, BS-JD) (p. 399)

BS Business Administration

- Business Economics co-major (p. 405)
- International Business (p. 408)
- International Business co-major (p. 411)

Minors

- Economics (p. 414)
- International Economics (p. 415)

Economics

Major: Economics
Degree Awarded: Bachelor of Science in Economics (BSECON) or Bachelor of Arts in Economics (BAECON)
Calendar Type: Quarter
Total Credit Hours: 187.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: (BS) 45.0603; (BA) 45.0601
Standard Occupational Classification (SOC) code: 19-3011

About the Program

Economics is at the root of business decisions, government policy making, and global relations. As a course of study, it can lead to diverse career opportunities, and is often viewed as excellent preparation for graduate programs in business, public policy, international affairs, and law. Both the BA in Economics and the BS in Economics programs provide students with an understanding of the market system, as well as economic institutions, policies, and development.

Bachelor of Arts in Economics

The BA in Economics introduces students to modern economics within the context of a broad-based liberal arts curriculum. The degree is oriented toward students with an interest in combining economics with courses in the humanities, and builds communications skills along with clarity of thought and expression. The degree requires that students develop a depth of knowledge in a coordinate field (minor or secondary major) outside of economics.

Bachelor of Science in Economics

The BS in Economics introduces students to modern economics within the context of a general scientific curriculum. This degree is oriented towards students interested in acquiring a broad-based education with a focus on quantitative and professional skills.

In addition to deep coverage of economics, the major includes liberal arts and sciences requirements. The degree stipulates that students either complete one of the specific economic concentrations (Business Economics or Mathematical Economics) or develop a depth of knowledge in a minor or secondary major field outside of economics. The BS in Economics program provides excellent training for graduate school in economics.

The BS in Economics offers concentration choices in both Business Economics and Mathematical Economics.

Business Economics Concentration

This concentration prepares students to apply the rigorous methods of modern quantitative economics as professionals in a business context. This program combines coursework in economics and the functional fields of business administration within a general scientific and humanities curriculum.

Mathematical Economics Concentration

This concentration prepares students for quantitative graduate programs in economics and other related fields. This program also prepares students for professional work in quantitative economics or closely related areas, by providing coursework in economics and mathematics.

Coordinate Field Option

As an alternative to choosing one of these concentrations, students may also personalize their degree by developing depth of knowledge in a minor or secondary major field outside of economics such as finance, social sciences, international studies, or natural sciences. Examples of possible coordinating minors include a minor in History or Politics for students interested in political economy or policy studies, a minor in Africana Studies for students interested in peoples of African descent, a minor in Communication for students interested in economic journalism, a minor in Data Science for students interested in the platform economy, or a minor in Global Studies for students interested in development. In addition, students can complete a specialization in business economics or mathematical economics as an area of concentration.

Minor in Economics (p. 414)

The minor in Economics provides a solid background in the application of economic theory to markets. Students complete standard courses in micro- and macroeconomics that emphasize core training in economic decision making. Students also choose a course that applies this training to a specific area such as international economics, behavioral economics, firm and industry behavior, or public policy. This type of analytical training provides a strong complement to many majors, including business fields,

but would be especially useful for students interested in careers in public policy or law.

Minor in International Economics (p. 415)

The minor in International Economics is designed for students with varied backgrounds who have a particular interest in learning more about the international economics. The curriculum provides the students a basic understanding of economics and exposes them to advanced topics dealing with international trade, international financial flows, multinational corporations, and other aspects of international economics. The minor complements a variety of degrees, particularly for students interested in applying their major discipline within an international context or within a multinational corporation.

Additional Information

For more information about this major, contact the School of Economics (https://www.lebow.drexel.edu/faculty-and-research/disciplines/economics/). (http://www.lebow.drexel.edu/Faculty/Departments/Economics/)

Degree Requirements (BS)

While a variety of options are available for study in coordinating fields, two specific concentrations have been developed to address key areas in economics.

- The business economics concentration
- The mathematical economics concentration

The requirements for those concentrations are listed beneath the general requirements for the BS in Economics program.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General education requirements

ANTH 101	Introduction to Cultural Diversity	3.0
CIVC 101	Introduction to Civic Engagement	1.0
COM 270 [WI]	Business Communication	3.0
CS 150	Computer Science Principles	3.0
or CS 171	Computer Programming I	
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
PSY 101	General Psychology I	3.0
SOC 101	Introduction to Sociology	3.0
UNIV B101	The Drexel Experience	1.0
UNIV B201 [WI]	Career Management	1.0
Select one of the following math sequences:		**8.0**
MATH 101 & MATH 102	Introduction to Analysis I and Introduction to Analysis II	
MATH 121 & MATH 122	Calculus I and Calculus II	
Fine arts elective		3.0
Three laboratory science electives		9.0
Two English literature electives: (ENGL 200 through ENGL 380)		6.0
One history elective		4.0

Two philosophy electives		6.0
Economics Requirements		
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
ECON 250	Game Theory and Applications	4.0
ECON 301	Microeconomics	4.0
ECON 321	Macroeconomics	4.0
ECON 322 [WI]	Economics Seminar	4.0
ECON 350 [WI]	Applied Econometrics	4.0
ECON 360	Time Series Econometrics	4.0
INTB 334	International Trade	4.0
INTB 336	International Money and Finance	4.0
STAT 201	Introduction to Business Statistics	4.0
STAT 202	Business Statistics II	4.0
Economics Electives		**20.0**
Select 20.0 credits from any of the following:		
ECON 203 [WI]	Survey of Economic Policy	
ECON 260	Economics of Small Business	
ECON 326 [WI]	Economic Ideas	
ECON 330	Managerial Economics	
ECON 331	International Macroeconomics	
ECON 334	Public Finance	
ECON 336	Labor Economics	
ECON 338	Industrial Organization	
ECON 342	Economic Development	
ECON 344	Comparative Economic Systems	
ECON 348	Mathematical Economics	
ECON 351	Resource and Environmental Economics	
ECON 354	Money and Banking	
ECON 361	Health Economics	
ECON T480	Special Topics in ECON	
ENVS 370	Practice of Environmental Economics	
FIN 301	Introduction to Finance	
FIN 325	Financial Institutions and Markets	
INTB 332	Multinational Corporations	
INTB 338	Regional Studies in Economic Policies and International Business	
INTB 440	Seminar in International Business	
SOC 240	Urban Sociology	
**Additional Requirements [**]		
Coordinate Field		26.0
Additional courses as required to satisfy a coordinating field (a second major, minor, or one of the two available concentrations below)		
Free electives		**30.0**
Total Credits		187.0

[*]   Students pursuing the concentration in Mathematical Economics should select CS 171 over CS 150

[**]   Students who take the Mathematical Economics or Business Economics concentrations must complete the required concentration courses and free electives for a total of 56.0 credits.

Mathematical Economics Concentration

Students selecting this concentration must have satisfied the general educational mathematics requirements by completing MATH 121 and MATH 122.

ECON 348	Mathematical Economics	4.0
MATH 123	Calculus III	4.0
MATH 200	Multivariate Calculus	4.0

MATH 201	Linear Algebra	4.0
MATH 210	Differential Equations	4.0
Select three of the following:		**9.0-12.0**
MATH 220 [WI]	Introduction to Mathematical Reasoning	
MATH 285	Differential Equations II	
MATH 300	Numerical Analysis I	
MATH 301	Numerical Analysis II	
MATH 305	Introduction to Optimization Theory	
MATH 320	Actuarial Mathematics	
MATH 401	Elements of Modern Analysis I	
MATH 402	Elements of Modern Analysis II	
Free electives		27.0-24.0
Total Credits		**56.0**

Business Economics Concentration

Required Courses

ACCT 115	Financial Accounting Foundations	4.0
ECON 330	Managerial Economics	4.0
FIN 301	Introduction to Finance	4.0
MIS 200	Management Information Systems	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
or BLAW 201	Business Law I	
Select two of the following:		8.0
ACCT 116	Managerial Accounting Foundations	
FIN 302	Intermediate Corporate Finance	
FIN 321	Investment Securities & Markets	
MKTG 201	Introduction to Marketing Management	
OPM 200	Operations Management	
Free electives		28.0
Total Credits		**56.0**

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Degree Requirements (BA)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

ANTH 101	Introduction to Cultural Diversity	3.0
CIVC 101	Introduction to Civic Engagement	1.0
COM 230	Techniques of Speaking	3.0
COM 270 [WI]	Business Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
INTB 200	International Business	4.0
MATH 101	Introduction to Analysis I	4.0
or MATH 121	Calculus I	
MATH 102	Introduction to Analysis II	4.0
or MATH 122	Calculus II	
PHIL 101	Introduction to Western Philosophy	3.0
PHIL 105	Critical Reasoning	3.0
PSY 101	General Psychology I	3.0
SOC 101	Introduction to Sociology	3.0
UNIV B101	The Drexel Experience	1.0
UNIV B201 [WI]	Career Management	1.0
College of Media Arts and Design elective		3.0
Two Laboratory Science courses [*]		6.0
Political Science elective		3.0
Social Science elective		3.0
Diversity elective		3.0
International Studies elective		3.0
Two Modern Language courses (at least through 201 level)		8.0
Required Economics Courses		
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
ECON 250	Game Theory and Applications	4.0
ECON 301	Microeconomics	4.0
ECON 321	Macroeconomics	4.0
ECON 322 [WI]	Economics Seminar	4.0
ECON 326 [WI]	Economic Ideas	4.0
INTB 334	International Trade	4.0
INTB 336	International Money and Finance	4.0
STAT 201	Introduction to Business Statistics	4.0
Economics Electives		**20.0**
Select five of the following:		
ECON 203 [WI]	Survey of Economic Policy	
ECON 260	Economics of Small Business	
ECON 330	Managerial Economics	
ECON 331	International Macroeconomics	
ECON 334	Public Finance	
ECON 336	Labor Economics	
ECON 338	Industrial Organization	
ECON 342	Economic Development	
ECON 344	Comparative Economic Systems	
ECON 348	Mathematical Economics	
ECON 350 [WI]	Applied Econometrics	
ECON 351	Resource and Environmental Economics	
ECON 354	Money and Banking	
ECON 360	Time Series Econometrics	
ECON 361	Health Economics	

ECON 365	Behavioral Economics	
ENVS 370	Practice of Environmental Economics	
FIN 301	Introduction to Finance	
FIN 325	Financial Institutions and Markets	
INTB 332	Multinational Corporations	
INTB 338	Regional Studies in Economic Policies and International Business	
INTB 440	Seminar in International Business	
SMT 320	Sport Economics	
SOC 240	Urban Sociology	
SOC 260	Classical Social Theory	
Coordinate Field (Minor or Major)		**24.0**
Two of the courses in the chosen coordinate field must be 200 level or above.		
Free Electives		**29.0**
Total Credits		187.0

* Science courses are selected from Biology (BIO), Chemistry (CHEM), Environmental Science (ENVS), Physics (PHYS), or Physics-Environmental Science (PHEV).

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study (BS)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121 or 101	Calculus I Introduction to Analysis I	4.0
PSY 101	General Psychology I	3.0
UNIV B101	The Drexel Experience	1.0
	Term Credits	15.0
Term 2		
CS 150 or 171	Computer Science Principles Computer Programming I	3.0
ECON 202	Principles of Macroeconomics	4.0

ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122 or 102	Calculus II Introduction to Analysis II	4.0
SOC 101	Introduction to Sociology	3.0
	Term Credits	17.0
Term 3		
ANTH 101	Introduction to Cultural Diversity	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
Laboratory science course		3.0
Philosophy elective		3.0
Economics elective*		4.0
	Term Credits	17.0
Term 4		
COM 270 [WI]	Business Communication	3.0
ECON 301	Microeconomics	4.0
STAT 201	Introduction to Business Statistics	4.0
History elective		4.0
Laboratory Science course		3.0
	Term Credits	18.0
Term 5		
ECON 250	Game Theory and Applications	4.0
ECON 321	Macroeconomics	4.0
STAT 202	Business Statistics II	4.0
Laboratory Science course		3.0
	Term Credits	15.0
Term 6		
ECON 350 [WI]	Applied Econometrics	4.0
INTB 334	International Trade	4.0
ENGL 200 through ENGL 380		3.0
Coordinate Field course (concentration/minor) or a Free elective		3.0
Philosophy elective		3.0
	Term Credits	17.0
Term 7		
ECON 360	Time Series Econometrics	4.0
INTB 336	International Money and Finance	4.0
Coordinate Field course (concentration/minor) or Free elective		3.0
Free elective		4.0
	Term Credits	15.0
Term 8		
Economics electives*		8.0
ENGL 200 through ENGL 380 course		3.0
Coordinate field course (concentration/minor) or a Free elective		3.0
Fine Arts elective		3.0
	Term Credits	17.0
Term 9		
Economics elective*		4.0
Coordinate Field courses (concentration/minor) or Free electives		6.0
Free electives		5.0
	Term Credits	15.0
Term 10		
ECON 322 [WI]	Economics Seminar	4.0
UNIV B201 [WI]	Career Management	1.0
Coordinate Field course (concentration/minor) or a Free elective		3.0
Economics elective*		4.0
Free elective		3.0
	Term Credits	15.0
Term 11		
Coordinate Field courses (concentration/minor) or Free electives		6.0

Economics elective[*]		4.0
Free elective		4.0
	Term Credits	14.0
Term 12		
Free electives		12.0
	Term Credits	12.0

Total Credit: 187.0

[*] See degree requirements for a list of courses that satisfy the Economics elective requirements.

Plan of Study (BA)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		**Credits**
UNIV 101	The Drexel Experience	1.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101 or 121	Introduction to Analysis I Calculus I	4.0
PSY 101	General Psychology I	3.0
	Term Credits	15.0
Term 2		
ECON 202	Principles of Macroeconomics	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 101 or 122	Introduction to Analysis I Calculus II	4.0
SOC 101	Introduction to Sociology	3.0
	Term Credits	14.0
Term 3		
ANTH 101	Introduction to Cultural Diversity	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
INTB 200	International Business	4.0
PHIL 105	Critical Reasoning	3.0
Lab Science (BIO, CHEM, ENVS, PHYS or PHEV)		3.0
	Term Credits	17.0
Term 4		
COM 230	Techniques of Speaking	3.0
ECON 301	Microeconomics	4.0
STAT 201	Introduction to Business Statistics	4.0
Lab Science (BIO, CHEM, ENVS, PHYS, OR PHEV)		3.0
AWCOMAD elective		3.0
	Term Credits	17.0
Term 5		
ECON 250	Game Theory and Applications	4.0
ECON 321	Macroeconomics	4.0
Political Science (PSCI) elective		4.0
Modern Language 101		4.0
	Term Credits	16.0
Term 6		
COM 270 [WI]	Business Communication	3.0
ECON 326 [WI]	Economic Ideas	4.0
INTB 334	International Trade	4.0

Modern Language 102		4.0
	Term Credits	15.0
Term 7		
INTB 336	International Money and Finance	4.0
PHIL 105	Critical Reasoning	3.0
Coordinate Field Course		3.0
Economics (ECON) elective		4.0
Modern Language 103 or Free elective		4.0
	Term Credits	18.0
Term 8		
Coordinate Field Courses		6.0
Modern Language 201 / Free elective		4.0
Diversity elective		3.0
Economics (ECON) elective		4.0
	Term Credits	17.0
Term 9		
Coordinate Field Courses		6.0
Economics (ECON) elective		4.0
Social Science elective		3.0
International elective		3.0
	Term Credits	16.0
Term 10		
ECON 322 [WI]	Economics Seminar	4.0
UNIV B201 [WI]	Career Management	1.0
Coordinate Field Courses		6.0
Economics (ECON) elective		4.0
	Term Credits	15.0
Term 11		
Coordinate Field Course		3.0
Economics (ECON) elective		4.0
Free electives		7.0
	Term Credits	14.0
Term 12		
Free electives		13.0
	Term Credits	13.0

Total Credit: 187.0

Co-op/Career Opportunities

The study of economics prepares students for a variety of fields: research economists in banks, government and universities; law; economic development for local government, banks and firms; business management and consulting; government and international agencies, such as the CIA, World Bank, IMF and USAID; and business and economic journalism.

Career Paths and Degree Combinations

Economics provides an excellent foundation for many career options and can also be combined with many other majors and minors in preparing students for great careers.

For example:

Banking and Finance

- Economics and Finance
- Economics and Business
- Economics and Mathematics
- Business Economics Concentration
- Economics and Physics

Academia

- Economics and Anthropology
- Economics and Psychology
- Economics and Mathematics
- Economics and Philosophy

Economics Research in Industry

- Economics and Mathematics
- Mathematical Economics Concentration
- Economics and Marketing
- Economics and Finance

High Tech and IT Industries

- Economics and Information Systems
- Economics and Chemistry
- Economics and Biology

Economics Research in Governments and International Organizations

- Economics and Environmental Studies
- Economics and Political Science
- Economics and International Studies

Law School and Other Graduate School Options

- Economics and Legal Studies
- Economics and Philosophy
- Economics and Political Science
- Economics and International Studies

Opportunities

Recently, economics students have obtained positions at the following institutions:

- Federal Reserve Bank, Board of Governors
- Citibank
- Vanguard Corporation
- Deloitte Consulting
- Black Rock Inc.
- Tyco Electronics

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Dual/Accelerated Degree

Dual Degree Bachelor's Programs

With careful planning, students can complete two full degrees in the time usually required to complete one. The double major option works best in closely related areas. For detailed information the student should contact his or her advisor.

Degree Requirements BS ECON Dual Degree Bachelor of Science / Juris Doctor

This program is a modified BS in Economics that allows students the ability to consider a BS/JD degree.

Conditional on successful admittance into Drexel's Kline School of Law (http://drexel.edu/law/).

Due to the complex nature of this program students should work closely with their advisor when selecting courses.

General Education		
ANTH 101	Introduction to Cultural Diversity	3.0
CIVC 101	Introduction to Civic Engagement	1.0
COM 270 [WI]	Business Communication	3.0
COOP 101	Career Management and Professional Development	0.0
CS 150	Computer Science Principles	3.0
or CS 171	Computer Programming I	
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
or MATH 121	Calculus I	
MATH 102	Introduction to Analysis II	4.0
or MATH 122	Calculus II	
PSY 101	General Psychology I	3.0
SOC 101	Introduction to Sociology	3.0
UNIV B101	The Drexel Experience (Part 1)	1.0
UNIV B201 [WI]	Career Management	1.0
CoMAD Elective		3.0
Three Science w/ Lab courses		9.0
Two English literature electives: (ENGL 200 through ENGL 380)		6.0
HIST Elective		4.0
PHIL Electives		6.0
Econ. Requirements		
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
ECON 250	Game Theory and Applications	4.0
ECON 301	Microeconomics	4.0
ECON 321	Macroeconomics	4.0
ECON 322 [WI]	Economics Seminar	4.0
ECON 350 [WI]	Applied Econometrics	4.0
ECON 360	Time Series Econometrics	4.0
INTB 334	International Trade	4.0
INTB 336	International Money and Finance	4.0
STAT 201	Introduction to Business Statistics	4.0
STAT 202	Business Statistics II	4.0
Econ. Electives		**20.0**
Free Electives		**28.0**
First Year Law School Classes		**28.0**

School of Economics Faculty

Marco Airaudo, PhD *(University of Pennsylvania Philadelphia)*. Associate Professor. Computational economics, international economics, macroeconomics and monetary economics.

Patricia Awerbuch, MBA *(Drexel University)*. Assistant Clinical Professor. Performance of on-campus students in an online classroom designed for distance learners; business professors.

Richard Barnett, PhD *(University of Minnesota)*. Clinical Professor. Economic theory, macroeconomics.

Sebastien Bradley, PhD *(University of Michigan)*. Associate Professor. Public finance, international economics.

Mian Dai, PhD *(Northwestern University)*. Assistant Professor. Managerial economics and strategy.

Pia DiGirolamo, PhD *(Purdue University)*. Assistant Clinical Professor. Macroeconomics, international finance.

Shawkat M. Hammoudeh, PhD *(University of Kansas)*. Professor. Applied econometrics, financial economics, international economics, and natural resource economics.

Teresa Harrison, PhD *(University of Texas Austin) Associate Dean, Academic Affairs*. Associate Professor. Econometrics, public finance, industrial organization, empirical microeconomics including health and nonprofit organizations.

Paul E. Jensen, PhD *(Penn State University) Associate Dean, College of Business*. Associate Professor. International trade. Primary research interest is international trade, particularly in empirical studies of international trade patterns.

Bang Nam Jeon, PhD *(Indiana University) Department of Economics and International Business*. Professor. Financial economics, world financial market linkages, foreign direct investment flows in the Asia-Pacific economies, the Korean economy: currency crisis, FDI, and macroeconomic issues, regional economic integration and newly industrializing economies: the

Stephen Joyce, MA *(Temple University)*. Assistant Clinical Professor. Education and human capital.

Andre Kurmann, PhD *(University of Virginia)*. Associate Professor. Computational economics, financial economics, labor economics, macroeconomics and monetary economics.

Christopher A. Laincz, PhD *(Duke University)*. Associate Professor. Economic development, technological change, and growth, industrial organization, macroeconomics and monetary economics.

Vibhas Madan, PhD *(Michigan State University)*. Professor. International trade theory, applied microeconomics.

Roger A. McCain, PhD *(Louisiana State University) Co-director*. Professor. Computational economics, game theory.

Bruce D. McCullough, PhD *(University of Texas Austin)*. Professor. Applied Econometrics, Data Mining, Econometric Techniques, Reliability of Statistical and Econometric Software.

Irina Murtazashvili, PhD *(Michigan State University)*. Assistant Professor. Applied econometrics.

Eydis Olsen, MA *(American University)*. Clinical Associate Professor. Macroeconomics, political economy.

Tristan Potter, PhD *(Boston College)*. Assistant Professor. Macroeconomics, labor.

Konstantinos Serfes, PhD *(University of Illinois at Champaign-Urbana)*. Professor. Industrial organization; microeconomics; game theory

Ricardo Serrano-Padial, PhD *(University of California at San Diego)*. Assistant Professor. Microeconomics theory, information economics with applications in finance, macroeconomics and industrial organization.

Mark Stehr, PhD *(University of California at Berkeley) Assistant Director School of Economics*. Associate Professor. Health economics, health behaviors, public finance, public policy.

Constantinos Syropoulos, PhD *(Yale University) Trustee Professor of International Economics*. Professor. International trade, political economy, applied microeconomics.

Yoto Yotov, PhD *(Boston College)*. Associate Professor. International trade, applied microeconomics, political economy.

Emeritus Faculty

Edward C. Koziara, PhD *(University of Wisconsin)*. Professor Emeritus. Applied micro and macro economics.

Bijou Yang Lester, PhD *(University of Pennsylvania)*. Professor Emeritus. Behavioral characteristics of shopping on-line, economic issues of electronic commerce, contingent employment and part-time work, the economy and suicide.

Andrew G. Verzilli, PhD *(Boston College)*. Professor Emeritus. Teaching effectiveness in economics; economics and financial history.

Chiou-shuang Yan, PhD *(Purdue University)*. Professor Emeritus. International economics, input-output analysis.

Business Economics

Major: Business Economics
Degree Awarded: Bachelor of Science in Business Administration (BSBA)
Calendar Type: Quarter
Total Credit Hours: 186.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 45.0601
Standard Occupational Classification (SOC) code: 11-9199; 19-3011; 19-3022; 25-1063

The Business Economics program is a "co-major."

About the Program

Economics is the study of allocating scarce resources among competing needs. The program places particular emphasis on the application of theory toward the solution of particular problems in such areas as international trade, money and finance, consumer activities, economic development, and other areas.

Drexel's Business Economics co-major is designed for students who wish to receive a sound education within a specific functional area of business (Primary major) while supplementing that knowledge with an overview of economics.

Prepares students to apply the rigorous methods of modern quantitative economics in a business context. This program combines coursework in

economics and the functional fields of business administration within the context of a general scientific and humanities curriculum.

More information can be found on the School of Economics webpage (http://www.lebow.drexel.edu/faculty-and-research/disciplines/economics/).

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COM 270 [WI]	Business Communication (WI)	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
PHIL 105	Critical Reasoning	3.0
PSY 101	General Psychology I	3.0
English literature elective: (ENGL 200 through ENGL 399)		3.0
UNIV B101	The Drexel Experience	1.0
UNIV B201 [WI]	Career Management	1.0
Fine arts elective		3.0
History (HIST) elective		4.0
Select two of the following:		6.0
BIO 100	Applied Cells, Genetics & Physiology	
or BIO 101	Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
General Education (Category) Electives *		**21.0**
Business Requirements		
ACCT 115	Financial Accounting Foundations	4.0
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
BUSN 101	Foundations of Business I	4.0
BUSN 102	Foundations of Business II	4.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
INTB 200	International Business	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
MIS 200	Management Information Systems	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
ORGB 300 [WI]	Organizational Behavior (WI)	4.0
STAT 201	Introduction to Business Statistics	4.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
MGMT 451	Management Simulation	
STAT 202	Business Statistics II	
Primary Major Courses		**32.0**

Students completing the business economics co-major must do so in conjunction with a primary business major. Students must select a primary major from the following list: accounting, entrepreneurship, finance, legal studies, management information systems, marketing, or operations & supply chain management.

Business Economics Requirements

ECON 301	Microeconomics	4.0
ECON 321	Macroeconomics	4.0
ECON 322 [WI]	Economics Seminar (WI)	4.0
Select three of the following:		12.0
ECON 250	Game Theory and Applications	
ECON 260	Economics of Small Business	
ECON 326 [WI]	Economic Ideas (WI)	
ECON 330	Managerial Economics	
ECON 331	International Macroeconomics	
ECON 334	Public Finance	
ECON 336	Labor Economics	
ECON 338	Industrial Organization	
ECON 342	Economic Development	
ECON 348	Mathematical Economics	
ECON 350 [WI]	Applied Econometrics (WI)	
ECON 351	Resource and Environmental Economics	
ECON 360	Time Series Econometrics	
ECON 361	Health Economics	
ECON 365	Behavioral Economics	
INTB 332	Multinational Corporations	
INTB 334	International Trade	
INTB 336	International Money and Finance	
INTB 338	Regional Studies in Economic Policies and International Business	
SMT 320	Sport Economics	
Total Credits		**186.0**

*   Students select seven (21.0 credits) of additional general education electives with a minimum of one course in each of the following categories:
  - Society and Culture (Communication, English, Fine Arts, International Area Studies, Language, Philosophy)
  - Social Science (Anthropology, History, Sociology, Political Science, Psychology)
  - Math and Science (Computer Science, Information Systems, Math, Science).

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BUSN 101	Foundations of Business I	4.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV B101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
BUSN 102	Foundations of Business II	4.0
CIVC 101	Introduction to Civic Engagement	1.0
ECON 202	Principles of Macroeconomics	4.0

ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	16.0
Term 3		
ACCT 115	Financial Accounting Foundations	4.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PSY 101	General Psychology I	3.0
Select one of the following:		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
General education elective		3.0
	Term Credits	16.0
Term 4		
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
COM 270 [WI]	Business Communication	3.0
STAT 201	Introduction to Business Statistics	4.0
	Term Credits	15.0
Term 5		
INTB 200	International Business	4.0
MIS 200	Management Information Systems	4.0
Select one of the following:		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
Social Science elective		3.0
	Term Credits	14.0
Term 6		
FIN 301	Introduction to Finance	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
English literature elective (ENGL 200 through 399)		3.0
	Term Credits	15.0
Term 7		
ECON 301	Microeconomics	4.0
ORGB 300 [WI]	Organizational Behavior (WI)	4.0
PHIL 105	Critical Reasoning	3.0
Primary Major course*		4.0
	Term Credits	15.0
Term 8		
ECON 321	Macroeconomics	4.0
Primary Major courses*		8.0
History (HIST) elective		4.0
	Term Credits	16.0
Term 9		
ECON Co-Major course (See co-major requirements for list)		4.0
Primary Major courses*		8.0
Society and culture elective		3.0
	Term Credits	15.0
Term 10		
UNIV B201 [WI]	Career Management	1.0
Primary Major course 6*		4.0
ECON Co-Major course (See co-major requirements for list)		4.0
General education elective		3.0
Fine arts elective		3.0
	Term Credits	15.0

Term 11		
MGMT 450	Strategy and Competitive Advantage	4.0
Science or computer science elective		3.0
ECON Co-Major course (See co-major requirements for list)		4.0
Primary Major course*		4.0
	Term Credits	15.0
Term 12		
ECON 322 [WI]	Economics Seminar	4.0
Primary Major course*		4.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
MGMT 451	Management Simulation	
STAT 202	Business Statistics II	
General education electives		6.0
	Term Credits	18.0

Total Credit: 186.0

*   Students completing the Business Economics Co-major must do so in conjunction with a primary business major. Students must select a primary major from the following list: Accounting, Entrepreneurship, Finance, Legal Studies, Management Information Systems, Marketing, or Operations & Supply Chain Management.

School of Economics Faculty

Marco Airaudo, PhD *(University of Pennsylvania Philadelphia).* Associate Professor. Computational economics, international economics, macroeconomics and monetary economics.

Patricia Awerbuch, MBA *(Drexel University).* Assistant Clinical Professor. Performance of on-campus students in an online classroom designed for distance learners; business professors.

Richard Barnett, PhD *(University of Minnesota).* Clinical Professor. Economic theory, macroeconomics.

Sebastien Bradley, PhD *(University of Michigan).* Associate Professor. Public finance, international economics.

Mian Dai, PhD *(Northwestern University).* Assistant Professor. Managerial economics and strategy.

Pia DiGirolamo, PhD *(Purdue University).* Assistant Clinical Professor. Macroeconomics, international finance.

Shawkat M. Hammoudeh, PhD *(University of Kansas).* Professor. Applied econometrics, financial economics, international economics, and natural resource economics.

Teresa Harrison, PhD *(University of Texas Austin) Associate Dean, Academic Affairs.* Associate Professor. Econometrics, public finance, industrial organization, empirical microeconomics including health and nonprofit organizations.

Paul E. Jensen, PhD *(Penn State University) Associate Dean, College of Business.* Associate Professor. International trade. Primary research interest is international trade, particularly in empirical studies of international trade patterns.

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Pacific economies, the Korean economy: currency crisis, FDI, and macroeconomic issues, regional economic integration and newly industrializing economies: the

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Christopher A. Laincz, PhD *(Duke University).* Associate Professor. Economic development, technological change, and growth, industrial organization, macroeconomics and monetary economics.

Vibhas Madan, PhD *(Michigan State University).* Professor. International trade theory, applied microeconomics.

Roger A. McCain, PhD *(Louisiana State University) Co-director.* Professor. Computational economics, game theory.

Bruce D. McCullough, PhD *(University of Texas Austin).* Professor. Applied Econometrics, Data Mining, Econometric Techniques, Reliability of Statistical and Econometric Software.

Irina Murtazashvili, PhD *(Michigan State University).* Assistant Professor. Applied econometrics.

Eydis Olsen, MA *(American University).* Clinical Associate Professor. Macroeconomics, political economy.

Tristan Potter, PhD *(Boston College).* Assistant Professor. Macroeconomics, labor.

Konstantinos Serfes, PhD *(University of Illinois at Champaign-Urbana).* Professor. Industrial organization; microeconomics; game theory

Ricardo Serrano-Padial, PhD *(University of California at San Diego).* Assistant Professor. Microeconomics theory, information economics with applications in finance, macroeconomics and industrial organization.

Mark Stehr, PhD *(University of California at Berkeley) Assistant Director School of Economics.* Associate Professor. Health economics, health behaviors, public finance, public policy.

Constantinos Syropoulos, PhD *(Yale University) Trustee Professor of International Economics.* Professor. International trade, political economy, applied microeconomics.

Yoto Yotov, PhD *(Boston College).* Associate Professor. International trade, applied microeconomics, political economy.

Emeritus Faculty

Edward C. Koziara, PhD *(University of Wisconsin).* Professor Emeritus. Applied micro and macro economics.

Bijou Yang Lester, PhD *(University of Pennsylvania).* Professor Emeritus. Behavioral characteristics of shopping on-line, economic issues of electronic commerce, contingent employment and part-time work, the economy and suicide.

Andrew G. Verzilli, PhD *(Boston College).* Professor Emeritus. Teaching effectiveness in economics; economics and financial history.

Chiou-shuang Yan, PhD *(Purdue University).* Professor Emeritus. International economics, input-output analysis.

International Business

Major: International Business
Degree Awarded: Bachelor of Science in Business Administration (BSBA)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 52.1101
Standard Occupational Classification (SOC) code: 11-1021; 11-1011; 25-1011

About the Program

The international business major explores the international business environment as well as the internal workings of international corporations and the impact of international considerations on the various functional areas of business.

This major includes in-depth study of a foreign language, and students students choose from a menu of courses to fulfill additional requirements. The curriculum is interdisciplinary, with courses drawn from across business disciplines, economics, and anthropology. Specialized operational courses are offered, along with more general theoretical and comparative ones.

For more information about this program, contact the School of Economics (https://www.lebow.drexel.edu/faculty-and-research/disciplines/economics/).

Degree Requirements

Students completing the major in international business are required to complete six courses in the same language (a language other than the student's native language) at Drexel University. It is recommended that students also take a 320 or 420 language course, focusing on the language of business or professions. This requires a minimum of 6 language courses (24.0 credits) at the college level or up to level 6 placement, including proficiency in at least one language. Some of these courses may count toward the student's general education electives.

Students may satisfy the language requirement through foreign language course replacement by studying overseas. All study abroad programs must be approved by the Study Abroad Office (http://www.drexel.edu/studyabroad/).

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Bachelor of Science in Business Administration (BSBA) Degree Requirements

General Education Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COM 270 [WI]	Business Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	

ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
PHIL 105	Critical Reasoning	3.0
PSY 101	General Psychology I	3.0
UNIV B101	The Drexel Experience	1.0
UNIV B201 [WI]	Career Management	1.0
English literature elective ENGL 200 through ENGL 399		3.0
Fine Arts elective		3.0
History (HIST) elective		4.0
Select two of the following:		6.0
BIO 100	Applied Cells, Genetics & Physiology	
or BIO 101	Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	

General Education Electives

Students select seven (21.0 credits) general education electives, with a minimum of one course in each of the following three categories. Students take the remaining 12.0 credits from any of the topics listed under Additional General Education Electives.		
Society and Culture		
Communication, English, Fine Arts, Global Studies, Language or Philosophy		3.0
Social Science		
Anthropology, History, Sociology, Political Science, Psychology		3.0
Science		
Computer Science, Information Systems, Science		3.0

Additional General Education Electives

| Twelve (12.0) credits must be earned by taking 4 courses from the following topics: Communication, English, Fine Arts, Global Studies, Language, Philosophy, Anthropology, History, Sociology, Political Science, Psychology, Computer Science, Information Systems, Math, Science | | 12.0 |

Business Requirements

ACCT 115	Financial Accounting Foundations	4.0
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
BUSN 101	Foundations of Business I (Online students take BUSN 111)	4.0
BUSN 102	Foundations of Business II (Online students take BUSN 112)	4.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
INTB 200	International Business	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
MIS 200	Management Information Systems	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 201	Introduction to Business Statistics	4.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
ORGB 420	Negotiations and Conflict Resolution	
STAT 202	Business Statistics II	

Major Requirements

Eight required courses (See Major Requirements list below)		32.0
Free Electives		**18.0**
Total Credits		180.0

Required International Business Major Courses *

INTB 440	Seminar in International Business	4.0
Category A, select a maximum of three of the following		12.0
ANTH 312	Approaches to Intercultural Behavior	

ECON 342	Economic Development	
ECON 344	Comparative Economic Systems	
INTB 334	International Trade	
INTB 336	International Money and Finance	
INTB 338	Regional Studies in Economic Policies and International Business	
Category B, select a minimum of four of the following		16.0
BLAW 340	International Business Law	
FIN 346	Global Financial Management	
INTB 332	Multinational Corporations	
MGMT 380	International Business Consulting	
MIS 347	Domestic and Global Outsourcing Management	
MKTG 357	Global Marketing	
Total Credits		32.0

*   Students majoring in international business must also complete a minimum of 6 language courses (24.0 credits) at the college level.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Recommended Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BUSN 101	Foundations of Business I	4.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV B101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
BUSN 102	Foundations of Business II	4.0
ECON 202	Principles of Macroeconomics	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0

MATH 102	Introduction to Analysis II	4.0
	Term Credits	15.0
Term 3		
ACCT 115	Financial Accounting Foundations	4.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
Select one of the following:		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
Modern Language 101/General Education elective		4.0
	Term Credits	15.0
Term 4		
ACCT 116	Managerial Accounting Foundations	4.0
COM 270 [WI]	Business Communication	3.0
STAT 201	Introduction to Business Statistics	4.0
Modern Language 102/General Education elective		4.0
	Term Credits	15.0
Term 5		
History Elective (HIST)		4.0
INTB 200	International Business	4.0
Select one of the following:		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
Modern Language 103/General Education elective		4.0
	Term Credits	15.0
Term 6		
MIS 200	Management Information Systems	4.0
BLAW 201	Business Law I	4.0
PSY 101	General Psychology I	3.0
Modern Language 201/Free elective		4.0
	Term Credits	15.0
Term 7		
FIN 301	Introduction to Finance	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
MKTG 201	Introduction to Marketing Management	4.0
Modern Language 202/General Ed Elective		4.0
	Term Credits	16.0
Term 8		
OPM 200	Operations Management	4.0
INTB Category A Elective		4.0
INTB Category B Elective		4.0
Modern Language 203/Free Elective		4.0
	Term Credits	16.0
Term 9		
PHIL 105	Critical Reasoning	3.0
INTB Category B Elective		4.0
INTB Category B Elective		4.0
Science Elective		3.0
	Term Credits	14.0
Term 10		
UNIV B201 [WI]	Career Management	1.0
INTB Category A Elective		4.0
Social science elective		3.0
ENGL 200 - ENGL 399 course		3.0
Free elective		3.0
	Term Credits	14.0
Term 11		

INTB Category A Elective		4.0
MGMT 450	Strategy and Competitive Advantage	4.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
MGMT 451	Management Simulation	
STAT 202	Business Statistics II	
Free elective		3.0
	Term Credits	15.0
Term 12		
INTB 440	Seminar in International Business	4.0
Fine Arts elective		3.0
Free electives		3.0
INTB Category B Elective		4.0
	Term Credits	14.0

Total Credit: 180.0

*   See degree requirements.

Co-op/Career Opportunities

International business graduates are employed in a variety of corporate settings, including the pharmaceutical, banking and telecommunication industries. Some students pursue graduate studies or find employment in multilateral governmental organizations.

The concentration has been designed to provide a competitive advantage for those students interested in international business careers. In addition to business coursework, students also take advantage of Drexel's programs in history-politics, sociology, anthropology, and other areas that focus on international topics.

The University offers minors in Arabic (p. 141), Chinese (p. 143), French (p. 146), German (p. 147), Italian Studies (p. 149), Japanese (p. 149), Korean (p. 150), and Spanish (p. 157). Each minor can include study of the vocabulary needed for business transactions within the particular language.

Proficiency certificates are also available to students at the intermediate level as proof that students are proficient enough to live abroad and interact with native speakers in their home countries and cultures. Proficiency certificates are available in Arabic (p. 165), Chinese (p. 166), French (p. 166), German (p. 167), Hebrew (p. 167), Italian (p. 168), Japanese, (p. 168) Korean, (p. 169) and Spanish (p. 169).

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities. Also visit the Career Guides (http://drexel.edu/scdc/career-services/counseling/career-guides/) provided by the Steinbright Career Development Center.

Facilities

In fall 2013, LeBow College opened its 12-story, Gerri C. LeBow Hall, with a finance trading lab, behavioral studies lab and integrated teaching technology in all classrooms. The new building features two lecture halls, 15 classrooms of varying sizes and seating configurations, including case study rooms and cluster classrooms designed to facilitate group work. Other amenities consist of extensive areas of student spaces, including 19 collaboration rooms, two quiet study areas, and 3,500 square feet of student lounges. Gerri C. LeBow Hall brings together faculty, students and staff, in a state of the art building on the University City campus. Please visit the LeBow College of Business webpage (http://

www.lebow.drexel.edu/about/campuses/philadelphia/location/gerri-c-lebow-hall/) to learn more about Gerri C. LeBow Hall.

International Business Faculty

Murugan Anandarajan, PhD *(Drexel University) Interim Associate Dean for Academic Affairs.* Professor. Cyber crime, strategic management of information technology, unstructured data mining, individual internet usage behavior (specifically abuse and addiction), application of artificial intelligence techniques in forensic accounting and ophthalmology.

Rolph E. Anderson, PhD *(University of Florida) Royal H. Gibson Sr. Professor of Marketing.* Professor. Personal selling and sales management; multivariate data analysis; customer relationship management (CRM); customer satisfaction and customer loyalty.

Trina larsen Andras, PhD *(University of Texas at Austin) Head of the Department of Marketing; Academic Director, Center for Corporate Research Management.* Professor. International marketing, marketing channels management, cross-cultural communication.

Orakwue B. Arinze, PhD *(London School of Economics).* Professor. Client/Server computing; Enterprise Application Software (EAS)/Enterprise Resource Planning Software (ERP); knowledge-based and decision support applications in operations management.

Qizhi Dai, PhD *(University of Minnesota).* Associate Professor. Business Value of Information Technology, eCommerce, Economics of Information Technology, Information System Management.

Lawrence Duke, MBA *(Harvard Business School).* Associate Clinical Professor. International marketing and strategy, new product development, business-to-business marketing, marketing of financial services.

David Gefen, PhD *(Georgia State University) Provost Distinguished Research Professor.* Professor. Strategic IT management; IT development and implementation management; research methodology; managing the adoption of large IT systems, such as MRP II, ERP, and expert systems; research methodology, eCommerce; Online Auctions; Outsourcing; SAS; Technology Adoption.

Shawkat M. Hammoudeh, PhD *(University of Kansas).* Professor. Applied econometrics, financial economics, international economics, and natural resource economics.

Yanliu Huang, PhD *(The Wharton School, University of Pennsylvania).* Associate Professor. Consumer n-store decision making, consumer planning, health marketing, memory and learning.

Bang Nam Jeon, PhD *(Indiana University) Department of Economics and International Business.* Professor. Financial economics, world financial market linkages, foreign direct investment flows in the Asia-Pacific economies, the Korean economy: currency crisis, FDI, and macroeconomic issues, regional economic integration and newly industrializing economies: the

Daniel Korschun, PhD *(Boston University).* Associate Professor. Brand and corporate reputation management, corporate social responsibility, internal marketing, marketing strategy, relationship marketing.

Dali Ma, PhD *(University of Chicago).* Associate Professor. Social hierarchy; Social networks; Sociology of entrepreneurship; Sociology of transitional China

Vibhas Madan, PhD *(Michigan State University).* Professor. International trade theory, applied microeconomics.

Stanley Ridgley, PhD *(Duke University).* Associate Clinical Professor. Business communication; Cognition and strategy; Competitive intelligence; Determinants of Firm Performance; Global Management; New Markets in Emerging Countries; Russian Business Culture.

Bert Rosenbloom, PhD *(Temple University) Rauth Chair of Electronic Commerce.* Professor. Marketing channels and distribution systems, electronic commerce, inter-organizational marketing management, wholesale and retail distribution, marketing strategy and planning.

Samir Shah, DPS *(Pace University).* Clinical Professor. Drexel University's Provost Fellow India Partnerships

Srinivasan Swaminathan, PhD *(University of Texas-Austin).* Professor. Marketing research and strategy, pricing and promotions, loyalty and satisfaction.

Constantinos Syropoulos, PhD *(Yale University) Trustee Professor of International Economics.* Professor. International trade, political economy, applied microeconomics.

Yoto Yotov, PhD *(Boston College).* Associate Professor. International trade, applied microeconomics, political economy.

International Business Co-Major

Major: International Business
Degree Awarded: Bachelor of Science in Business Administration (BSBA)
Calendar Type: Quarter
Total Credit Hours: 186.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 52.1101
Standard Occupational Classification (SOC) code: 11-1021; 11-1011; 25-1011

About the Program

The International Business Co-Major explores the international business environment as well as the internal workings of international corporations and the impact of international considerations on the various functional areas of business.

The International Business Co-Major allows students to choose from a menu of courses. The curriculum is interdisciplinary, with courses drawn from across business disciplines, economics, and anthropology. Specialized operational courses are offered, along with more general theoretical and comparative ones. The co-major option substitutes further training in a relevant business discipline or functional field in the form of a Primary Major for the language courses that are required under the International Business Major.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COM 270 [WI]	Business Communication (WI)	3.0

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
PHIL 105	Critical Reasoning	3.0
PSY 101	General Psychology I	3.0
UNIV B101	The Drexel Experience	1.0
UNIV B201 [WI]	Career Management	1.0
English literature elective: (ENGL 200 through ENGL 399)		3.0
Fine arts elective		3.0
History (HIST) elective		4.0
Select two of the following:		6.0
BIO 100	Applied Cells, Genetics & Physiology	
or BIO 101	Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
General Education (Category) Electives [*]		**21.0**
Business Requirements		
ACCT 115	Financial Accounting Foundations	4.0
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
BUSN 101	Foundations of Business I	4.0
BUSN 102	Foundations of Business II	4.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
INTB 200	International Business	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
MIS 200	Management Information Systems	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 201	Introduction to Business Statistics	4.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
MGMT 451	Management Simulation	
STAT 202	Business Statistics II	
Primary Major Courses		**32.0**

Students completing the International Business co-major (requirements listed below) must do so in conjunction with a primary business major. Students must select a primary major from the following list (Accounting, Entrepreneurship, Finance, Legal Studies, Management Information Systems, Marketing, or Operations & Supply Chain Management.)

International Business Co-Major Requirements [**]

The International Business Major offers two options: Option (A), which includes study for competency in a language other than English (and other than the student's native language). For more information, please see the International Business (Stand-Alone Option) listed under Majors. Option (B) is the Co-Major option highlighted below. The co-major option substitutes further training in a relevant business discipline or functional field in the form of a Primary Major instead of the language courses.

Select six of the following:		24.0
ANTH 312	Approaches to Intercultural Behavior	
BLAW 340	International Business Law	
ECON 342	Economic Development	
ECON 344	Comparative Economic Systems	
FIN 346	Global Financial Management	

INTB 332	Multinational Corporations	
INTB 334	International Trade	
INTB 336	International Money and Finance	
INTB 338	Regional Studies in Economic Policies and International Business	
INTB 440	Seminar in International Business	
MGMT 380	International Business Consulting	
MIS 347	Domestic and Global Outsourcing Management	
MKTG 357	Global Marketing	
Total Credits		186.0

[*]   Students select 21.0 credits of additional general education electives with a minimum of one course in each of the following categories:
- Society and Culture (Communication, English, Fine Arts, International Area Studies, Language, Philosophy)
- Social Science (Anthropology, History, Sociology, Political Science, Psychology)
- Math and Science (Computer Science, Information Systems, Math, Science)

[**]   Students completing the International Business co-major must do so in conjunction with a primary business major. Students must select a primary major from the following list:
- Accounting
- Finance
- Legal Studies
- Management Information Systems
- Marketing
- Operations & Supply Chain Management

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BUSN 101	Foundations of Business I	4.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV B101	The Drexel Experience	1.0
	Term Credits	16.0
Term 2		
BUSN 102	Foundations of Business II	4.0
CIVC 101	Introduction to Civic Engagement	1.0
ECON 202	Principles of Macroeconomics	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	16.0
Term 3		
ACCT 115	Financial Accounting Foundations	4.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
PSY 101	General Psychology I	3.0
Select one of the following:		3.0
BIO 100 or 101	Applied Cells, Genetics & Physiology / Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	

PHYS 151	Applied Physics	
General education elective		3.0
	Term Credits	**16.0**
Term 4		
ACCT 116	Managerial Accounting Foundations	4.0
BLAW 201	Business Law I	4.0
COM 270 [WI]	Business Communication	3.0
STAT 201	Introduction to Business Statistics	4.0
	Term Credits	**15.0**
Term 5		
INTB 200	International Business	4.0
MIS 200	Management Information Systems	4.0
Select one of the following:		4.0
MGMT 260	Introduction to Entrepreneurship	
MGMT 370	For-Profit Business Consulting	
MGMT 371	Nonprofit Business Consulting	
MGMT 451	Management Simulation	
STAT 202	Business Statistics II	
Select one of the following:		3.0
BIO 100	Applied Cells, Genetics & Physiology	
or 101	Applied Biological Diversity, Ecology & Evolution	
CHEM 151	Applied Chemistry	
PHYS 151	Applied Physics	
	Term Credits	**15.0**
Term 6		
FIN 301	Introduction to Finance	4.0
MKTG 201	Introduction to Marketing Management	4.0
OPM 200	Operations Management	4.0
English literature elective - ENGL 200 through 399		3.0
	Term Credits	**15.0**
Term 7		
ORGB 300 [WI]	Organizational Behavior (WI)	4.0
PHIL 105	Critical Reasoning	3.0
Primary Major course[*]		4.0
International Business Co-Major Course (See co-major requirements for list)		4.0
	Term Credits	**15.0**
Term 8		
Primary Major course[*]		4.0
International Business Co-Major Course (See co-major requirements for list)		4.0
History (HIST) elective		4.0
Science or computer science elective		3.0
	Term Credits	**15.0**
Term 9		
Primary Major courses[*]		8.0
Society and culture elective		3.0
International Business Co-Major Course (See co-major requirements for list)		4.0
	Term Credits	**15.0**
Term 10		
UNIV B201 [WI]	Career Management	1.0
Fine Arts elective		3.0
General education elective		3.0
Primary Major course[*]		4.0
International Business Co-Major Course (See co-major requirements for list)		4.0
	Term Credits	**15.0**
Term 11		
MGMT 450	Strategy and Competitive Advantage	4.0
Primary Major courses[*]		8.0
International Business Co-Major Course (See co-major requirements for list)		4.0
	Term Credits	**16.0**
Term 12		
Primary Major course[*]		4.0

General education electives	6.0
Social science elective	3.0
International Business Co-Major Course (See co-major requirements for list)	4.0
Term Credits	**17.0**

Total Credit: 186.0

* See catalog for a list of Business majors that may be completed in conjunction with the International Business Co-Major.

Facilities

In fall 2013, LeBow College opened its 12-story, Gerri C. LeBow Hall, with a finance trading lab, behavioral studies lab and integrated teaching technology in all classrooms. The new building features two lecture halls, 15 classrooms of varying sizes and seating configurations, including case study rooms and cluster classrooms designed to facilitate group work. Other amenities consist of extensive areas of student spaces, including 19 collaboration rooms, two quiet study areas, and 3,500 square feet of student lounges. Gerri C. LeBow Hall brings together faculty, students and staff, in a state of the art building on the University City campus. Please visit the LeBow College of Business webpage (http://www.lebow.drexel.edu/about/campuses/philadelphia/location/gerri-c-lebow-hall/) to learn more about Gerri C. LeBow Hall.

International Business Faculty

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Samir Shah, DPS *(Pace University)*. Clinical Professor. Drexel University's Provost Fellow India Partnerships

Srinivasan Swaminathan, PhD *(University of Texas-Austin)*. Professor. Marketing research and strategy, pricing and promotions, loyalty and satisfaction.

Constantinos Syropoulos, PhD *(Yale University) Trustee Professor of International Economics*. Professor. International trade, political economy, applied microeconomics.

Yoto Yotov, PhD *(Boston College)*. Associate Professor. International trade, applied microeconomics, political economy.

Minor in Economics

About the Minor

The minor in economics provides a solid background in the application of economic theory to markets. Students complete standard courses in micro- and macroeconomics that emphasize core training in economic decision making. Students also choose a course that applies this training to areas such as international economics, firm and industry behavior, quantitative economic analysis, and public policy. This type of analytical training provides a strong complement to many majors, including business fields, but would be especially useful for students interested in careers in public policy or law.

Requirements

- No more than 2 courses or 8.0 credits required by a student's major may be counted towards this minor.
- A grade of "C" (2.0) or better must be earned for each course in this minor for it to be counted.
- No more than two transfer courses may be used to complete this minor. Transfer credits must be taken before matriculated at Drexel.
- Students should check the pre-requisites of all classes when selecting electives. It is the responsibility of the student to know pre-requisites.
- **Cannot do a major and a minor in the same field of study.**

All prospective students should meet with an advisor from the College as soon as possible. Call 215.895.2110 to set up an appointment.

Required Courses

ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
ECON 301	Microeconomics	4.0
ECON 321	Macroeconomics	4.0
ECON 322 [WI]	Economics Seminar	4.0
Select one of the following:		**4.0**
ECON 203 [WI]	Survey of Economic Policy	
ECON 250	Game Theory and Applications	
ECON 260	Economics of Small Business	
ECON 326 [WI]	Economic Ideas	
ECON 331	International Macroeconomics	
ECON 334	Public Finance	
ECON 336	Labor Economics	
ECON 338	Industrial Organization	
ECON 342	Economic Development	
ECON 348	Mathematical Economics	
ECON 350 [WI]	Applied Econometrics	
ECON 351	Resource and Environmental Economics	
ECON 354	Money and Banking	
ECON 361	Health Economics	
ECON 365	Behavioral Economics	
INTB 332	Multinational Corporations	
INTB 334	International Trade	
INTB 336	International Money and Finance	
INTB 338	Regional Studies in Economic Policies and International Business	
SMT 320	Sport Economics	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-

centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in International Economics

About the Minor

This minor is designed for students with varied backgrounds who have a particular interest in learning more about the international economic environment. The curriculum provides the students a basic understanding of economics and exposes them to advanced topics dealing with international trade, multinational corporations, and other aspects of international economics. The minor complements a variety of degrees, particularly for students interested in applying their major discipline within an international context or within a multinational corporation.

Requirements

- No more than 2 courses or 8.0 credits required by a student's major may be counted towards this minor.
- A grade of "C" (2.0) or better must be earned for each course in this minor for it to be counted.
- No more than two transfer courses may be used to complete this minor. Transfer credits must be taken before matriculated at Drexel.
- Students should check the pre-requisites of all classes when selecting electives. It is the responsibility of the student to know pre-requisites.
- **Cannot do a major and a minor in the same field of study.**

All prospective students should meet with an advisor from the College as soon as possible. Call 215.895.2110 to set up an appointment.

Required Courses		
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
INTB 200	International Business	4.0
INTB 334	International Trade	4.0
or INTB 336	International Money and Finance	
Select two of the following (at least one from the following list):		8.0
INTB 332	Multinational Corporations	
INTB 334	International Trade	
INTB 336	International Money and Finance	
INTB 338	Regional Studies in Economic Policies and International Business	
ECON 342	Economic Development	
Other Options		
ECON 301	Microeconomics	
ECON 321	Macroeconomics	
ECON 322 [WI]	Economics Seminar	
ECON 336	Labor Economics	
ECON 338	Industrial Organization	
ECON 348	Mathematical Economics	
ECON 350 [WI]	Applied Econometrics	
ECON 351	Resource and Environmental Economics	
BLAW 340	International Business Law	
FIN 346	Global Financial Management	
MKTG 357	Global Marketing	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

The Pennoni Honors College

About the College

The mission of Drexel University's Pennoni Honors College is to enrich the University experience for talented and ambitious students from all majors. The College has five units: the Honors Program, the Center for Interdisciplinary Inquiry (which includes The Symposium and the Custom-Designed Major), the Office of Undergraduate Research (which includes the STAR Scholars and SuperNova Programs), the Center for Scholar Development (which includes the Drexel Fellowships Office (http://drexel.edu/fellowships/) and U (http://drexel.edu/pennoni/scholardevelopment/aspire/)ndergraduate Scholarly Development (https://drexel.edu/pennoni/scholardevelopment/scholarly-enrichment/)), and the Marketing & Media department (which includes *TheSmartSet.com*, Pop, the Question (https://drexel.edu/pennoni/media/Podcast/) podcast, Honor Bound magazine (https://drexel.edu/pennoni/media/phc-magazine/), and *The Drexel InterView*, now known as *The Civil Discourse*). Students have the opportunity to apply to the Pennoni Honors Program as late as the spring term of their second year. The other programs and initiatives in the College are open to all students at the University with the appropriate interests and record of achievement. The College also administers the High School Scholars Program for exceptional high school students.

The Pennoni Honors College was endowed by Annette and C.R. "Chuck" Pennoni, CEO of Pennoni Associates. Mr. Pennoni, a Drexel graduate, was a two-time interim president of the University. He embodies the qualities of leadership, integrity, intellectual curiosity, and commitment to Drexel and the larger world that the College seeks to imbue in its students. With the help of a gift from Greg Bentley, CEO of Bentley Systems, and his wife Caroline, Drexel University will open Bentley Hall, a combined residence, programming, seminar, and office space.

Major

- Custom-Designed Major (p. 416)
  (within the Center for Interdisciplinary Inquiry)

Minor

- *NEW:* Interdisciplinary Problem-Solving

Custom-Designed Major

Major: Custom-Designed Major
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.0
Classification of Instructional Programs (CIP) code: 24.0101
Standard Occupational Classification (SOC) code: 11-9199

About the Program

The Custom-Designed Major enables students to pursue an individualized course of study at Drexel University not readily available through an existing major, or a combination of existing majors and/or minors. The program is designed for highly motivated students whose interdisciplinary curiosity and career ambitions cannot be satisfied by a traditional major. Students typically interested in pursuing a Custom-Designed Major are motivated by a particular theme, topic, issue, or problem that can be more holistically addressed by combining multiple fields of knowledge.

The major offers students the opportunity for an early intensive research experience, incorporates cooperative education as part of its degree requirements (either four years with one co-op, or five years with three co-ops), and culminates in an original, interdisciplinary senior-year project.

Each student accepted into the program will be advised by the program staff and closely mentored during their senior year by one or more Drexel faculty members with expertise in at least one of the disciplines composing the student's proposed course of study. Students may be admitted as entering freshmen or by external or internal transfer. Current Drexel students seeking a change of major to Custom-Designed must have final applications submitted by Week one of the summer term preceding their junior year. Students **do not** need to be members of the Honors Program to be eligible to apply to the program.

For additional information about applying to this program, contact either the Program Director, Dr. Kevin D. Egan at kde25@drexel.edu or Associate Director, Dr. Katie Barak at ksb89@drexel.edu.

Admission Requirements

Admission to the custom-designed major will be determined on the basis of an application portfolio. Please note: students do not need to be members of the Honors Program in order to apply to the major. In addition to the standard Admissions application, the portfolio will contain:

- **a vision statement** describing in detail what the student hopes to accomplish during his or her time in the program, as well as explaining why the student's educational goals cannot be met by pursuing a traditional Drexel major, a double major, or a major combined with minors.
- **a plausible plan of study** for achieving the student's aims by drawing upon multiple existing Drexel programs, and mapping out term by term which courses the student intends on taking.
- **student transcript**
- **SAT scores**
- **two letters of support** from individuals who can speak to the student's desire and ability to embark on an unconventional, individualized course of study.
- when requested, **examples** of projects completed independently by the student, in either a school or an extracurricular setting.

Degree Requirements

Foundation Requirements

CSDN 101 [WI]	Introduction to Multi-Disciplinary Methods	1.0
CSDN 102	Knowledge by Design Seminar	1.0
WEST 210	Innovative Problem Solving	4.0
WEST 220	Multimodal Research	4.0
COOP 101	Career Management and Professional Development	0.0
HNRS 200	Introduction to Honors Program	1.0
UNIV X101	The Drexel Experience	2.0
Humanities courses		9.0
Social sciences courses		9.0
Mathematics courss		6.0
Science courses		8.0
Written Evaluation		

At the conclusion of the spring term of the freshman year (or after 3 terms of study for transfers) the student will receive a written evaluation and personal consultation regarding his or her progress. At this point each student will either be allowed to continue in the Custom-Designed Major or will be advised to transfer to another major at Drexel University.

Additional Program Requirements

CSDN 203	Custom-Designed Major Seminar (two terms) [*]	2.0
Three 300- or 400-level courses in each discipline comprising a significant component of the custom-designed curriculum [**]		9.0
Three terms of (CSDN) self-directed major project sequence courses		9.0

Guided Course Selection

Students will complete the courses in their agreed-upon customized programs of study under the guidance of the Program Director and other faculty as appropriate. Each student will receive sustained guidance on course selection and sequencing. In addition, at the completion of each academic year, each student will meet with the Program Director to refine and update their vision statement as needed.	115.0
Total Credits	180.0

[*]   Taken for one credit each in the sophomore and junior years.

[**]   All prerequisite courses for these selected courses must also be satisfied.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Co-op and Career Services

Students in the program have the option of two co-op cycles: one is a 5-year program with 3 co-op cycles (5COP), and the second option is 4-year program with one co-op cycle (4COP). Students will meet with their career services adviser during their time in the program to closely match career objectives with curriculum design and co-op/research opportunities.

Minor in Interdisciplinary Problem Solving

About the Minor

The 21st century will be defined by the complexity and interconnected nature of human endeavors. The challenges of this interconnected world are vast, and they will require problem-solvers who are both specialized and capable of working across many fields of knowledge. The Interdisciplinary Problem Solving Minor provides students across the University the opportunity to develop applied problem solving skills to meet these challenges. The focus of the minor is to help students integrate information, methods of inquiry, research skills, and experiential learning from across multiple fields of knowledge. Students will be encouraged to draw from their major field of study, while also exploring other fields related to addressing complex, real world problems. The minor will also encourage experimentation and synthesis while students engage with models of interdisciplinary research.

Admission Requirements

The Interdisciplinary Problem Solving Minor is open to all University students that meet the criteria for acceptance; students **do not** need to be a member of the Honors Program to take part in the minor (Symposium courses are open to all Drexel students). Because of the nature of the minor, success is dependent upon students showing self-discipline, being highly motivated and self-reliant. All applications for the minor will be submitted to the director of the minor.

Please contact Dr. Kevin D. Egan at kde25@drexel.edu with questions concerning the PSMI Minor.

The following are the requirements that students must meet to be considered:

- Required Essay: Student statement of interest and desired goals
- Required Recommendation: One letter of recommendation from faculty that speaks to the student's ability to be collegial and collaborative, exhibit initiative and resourcefulness and ability to work independently.

Program Requirements

Required Courses

CSDN 210	Methods of Interdisciplinary Inquiry	3.0
CSDN 220	Integrative Research Methods	3.0
HNRS 302	Honors Colloquium (Take two times)	6.0
Electives [*]		**12.0**
Students choose 12 credits of electives; suggested courses include the following:		
BIO 264	Ethnobotany	
BMES 101	Introduction to BMES Design I – Defining Medical Problems	
BMES 102	Introduction to BMES Design II – Evaluating Design Solutions	
BMES 124	Biomedical Engineering Freshman Seminar I	
BUSN 103	Advanced First Year Business Seminar	
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	
CIVE 240 [WI]	Engineering Economic Analysis	
COM 111	Principles of Communication	
COM 220	Qualitative Research Methods	
COM 317 [WI]	Environmental Communication	
ENVS 260	Environmental Science and Society	
INFO 101	Introduction to Computing and Security Technology	
INFO 102	Introduction to Information Systems	
INFO 103	Introduction to Data Science	
INTR 310	Sustainability: History, Theory and Critic	
MGMT 260	Introduction to Entrepreneurship	
MGMT 364	Technology Management	
MIS 200	Management Information Systems	
PROD 215	Design Thinking in Product Design	
PSY 352	Psychology of Sustainability	
SOC 341	Environmental Movements in America	
Total Credits		24.0

*   Other courses may be substituted with the approval of the minor
       director.

The School of Biomedical Engineering, Science and Health Systems

Mission Statement

The mission of the School of Biomedical Engineering, Science and Health Systems is to promote health and quality of life through education, research and innovation that integrates engineering and life sciences in a global context.

The School of Biomedical Engineering, Science, and Health Systems (http://drexel.edu/biomed/) is a nationally recognized center for research in biomedical engineering and science offering multi-disciplinary instruction on a full- and part-time basis at the graduate and undergraduate levels.

The School of Biomedical Engineering, Science, and Health Systems offers a bachelor of science program in biomedical engineering with a choice of five concentration areas: biomaterials and tissue engineering, biomechanics and human performance engineering, biomedical informatics, biomedical devices and imaging, and neuroengineering.

Major

- Biomedical Engineering (BSBE) (p. 420)

About the School

The School of Biomedical Engineering, Science, and Health Systems (http://drexel.edu/biomed/) (formerly the Biomedical Engineering and Science Institute, founded in 1961) is a leader in biomedical engineering and biomedical science research and education. The undergraduate program was inaugurated in September 1998 and has steadily grown to attract the highest ability students at the University. The undergraduate biomedical engineering curriculum is accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org).

The School's academic thrust areas, both in research and education, are at the forefront of biosensing, bioimaging, bioinformation engineering and integrated bioinformatics, drug delivery, biomedical ultrasound & optics, bionanotechnology, cellular tissue engineering, neuroengineering and human performance. Emerging initiatives include skin bioengineering and pediatric engineering. Various departments at Drexel University offer courses that are suited for students in biomedical engineering and biomedical science. The School's curriculum complements the strengths of the Colleges of Arts & Sciences, Business, Engineering, Computing & Informatics, Law, Medicine, and Nursing. As a whole, the curriculum offers the advanced knowledge needed for industrial careers, health professions, graduate research or careers in highly specialized fields such as pre-professional health (medical, dental, and veterinary) and pre-law.

The marriage of technology with biology and medicine drives the 21st Century industrial enterprise. Consistent with this mission, the School strives for clinical and industrial relevance in our academic pursuits, and also maintains a strong entrepreneurship program in biomedical technologies. The School's alliance with regional economic development agencies and corporations together with advisors from business

development, legal, and investment communities sustains the growth of this program. The students and faculty of the School are committed to move their discoveries from laboratories to clinical practice or home use. The success of the Translational Research in Biomedical Technologies program has been recognized and funded regionally as well as nationally.

The School has experienced remarkable growth in recent years thanks to our outstanding research portfolio, high quality and innovative graduate and undergraduate programs, and our multidisciplinary approach to education and research. Another competitive advantage is the unique free-standing university-level administrative structure with its own tenure-track faculty lines, budget and space. This helps transcend the traditional organizational boundaries of engineering, sciences and medicine. The School's independence allows the pursuit of growth and collaborations in various disciplines and its structure provides agility to reconfigure and reorganize in response to emerging opportunities. The University Strategic Plan recognizes our School of Biomedical Engineering, Science and Health Systems as "Drexel's prototype of academic integration. "

Metropolitan Philadelphia has one of the nation's highest concentrations of medical institutions and pharmaceutical, biotechnology, medical device and systems industry. The School has forged strategic partnerships with select universities, research institutes, health care institutions and industries in the region. The School enjoys a close working relationship with our Drexel College of Medicine as well as alliances with prominent medical institutions in the region to develop joint research and educational programs. These include the University of Pennsylvania, Thomas Jefferson University, the Fox Chase Cancer Center and the Wistar Institute. These collaborative initiatives provide students with ample opportunities in basic and clinical research as well as innovative academic programs.

Co-operative Education

Co-op and career opportunities available to students include employment in the medical device, equipment, and systems industry; the biomaterial and implant industry; the pharmaceutical industry; the biotechnology and agricultural industry; the telemedicine and tele-health industry; health care; medical and clinical information and management systems; and biomedical technology transfer. Preprofessional options available in the academic programs of the School prepare students for admission to schools of medicine, dentistry, and veterinary medicine. Students may also choose to continue their education at the graduate level to prepare for careers in research and development in biomedical engineering and science.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Special Programs

Accelerated Bachelor's/Master's Dual Degree Program

The Accelerated BS/MS degree program provides opportunities for strongly motivated students with high ability to progress toward their educational goals at an accelerated pace. The program makes it possible for top engineering students to obtain both a bachelor's and master's degree in the same time period that it takes most Drexel students to obtain a bachelor's degree.

Preprofessional Programs

Students who want to prepare for admission to schools of medicine, dentistry, or veterinary medicine have the option to pursue a pre-medical curriculum, including the BS/MD and early assurance programs at the Drexel College of Medicine. Students obtain professional counseling and assistance from the Office of Preprofessional Programs, 215-895-2437.

University Honors

Students in the Biomedical Engineering program may apply for admission to the University Honors Program. Admission depends on superior academic performance at Drexel and may be approved after a personal interview with the Honors Committee.

BME Learning Community

The mission of the Biomedical Engineering Learning Community (BLC) is to promote a dynamic and collaborative environment by forming a close-knit community living together on the same floor in Millennium Hall. Members of the BLC are not only housed together, but also attend classes together, participate in team building activities, and attend various academic and social events. These events and activities actively promote academic success and a sense of community among students. BLC students will build life-long friendships, networking connections, and make lasting college memories.

Study Abroad Programs

The School enjoys a robust association and participation in the Drexel University Study Abroad Program. Multiple programs afford the BME student an opportunity to travel and experience new places and cultures in ways that fit their objectives.

Free standing programs are designed specifically for study abroad purposes. Courses are taken by students from Drexel and other American universities. Because the programs are catered specifically for study abroad students (rather than local students), courses usually include field trips and site visits to utilize the city as an integral part of the learning experience. Some programs only have a select list of courses while others have more extensive courses available.

Intensive Courses Abroad (ICAs) offer the opportunity to have an international academic experience in a short period of time (generally 7 - 10 days during break weeks). ICAs are normally led by a Drexel faculty director, in conjunction with an on campus course before and/or after the tour. They include activities such as guest lectures, industry visits, and other hands on events that transform the city into a living laboratory. The Drexel BME program regards the study abroad experience as a significant part of becoming a global leader in the field

Biomedical Engineering

Major: Biomedical Engineering
Degree Awarded: Bachelor of Science in Biomedical Engineering (BSBE)
Calendar Type: Quarter
Total Credit Hours: 185.5
Co-op Options: Three Co-op (Five years); One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 14.0501
Standard Occupational Classification (SOC) code: 17-2031

About the Program

Biomedical Engineering is an innovative Bachelor of Science degree program developed and delivered in collaboration with the College of Engineering, the College of Arts and Sciences and the College of Computing & Informatics. It prepares students to conceive, design, and develop devices and systems that improve human health and quality of life. Biomedical engineering is the convergence of life sciences with engineering. From child car seats and football helmets to drug-delivery systems, minimally invasive surgery, and noninvasive imaging technology, the work of the biomedical engineer makes a difference in everyone's life.

This program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (http://www.abet.org).

Concentrations

The undergraduate biomedical engineering curriculum is designed to strike a balance between academic breadth in biomedical engineering and specialization in an area of concentration. Each concentration has its own degree requirements for graduation, and its own plan of study:

- Biomaterials and Tissue Engineering
- Biomechanics and Human Performance Engineering
- Biomedical Informatics
- Biomedical Devices and Imaging
- Neuroengineering

The degree program provides innovative experiences in hands-on experimentation and engineering design as well as opportunities for personal growth and development of leadership and communication skills.

Working with a faculty advisor, students can select their core and elective courses from the curricula offered by the School of Biomedical Engineering, Science, and Health Systems and the Departments of Biology, Chemistry, Physics, Mathematics, Chemical Engineering, Mechanical Engineering, Materials Science and Engineering, Electrical and Computer Engineering, and the College of Computing & Informatics.

Additional Information

More information about the School's undergraduate program can be found at the School of Biomedical Engineering, Sciences and Health Systems' Academic Program (http://drexel.edu/biomed/academics/undergraduate-programs/) web page.

Students are also encouraged to contact the School's Director for Student Services:

Caryn Glaser
Director of Student Services
School of Biomedical Engineering, Science and Health Systems
215.895.2237
glasercb@drexel.edu

Career and professional counseling is provided independently by the student's staff and faculty advisors. Information regarding undergraduate faculty advisors is available on the School's Undergraduate Advising (http://drexel.edu/biomed/resources/current-undergraduate/advising/) web page.

Program Educational Objectives

PEO - Graduates Whose Careers Effectively Leverage Their Education in Biomedical Engineering

As a result, graduates will be able to recognize and/or create opportunities, adjust to new conditions and take advantage of opportunities across multiple boundaries - disciplinary, geographic, social

and cultural. Graduates may demonstrate success through professional/personal recognition and/or advancement.

PEO - Graduates Competent to Obtain Additional Knowledge and/or Skills

As a result, graduates will continue to learn and enhance their skills through professional development and/or research activities. Graduates may use this new knowledge and/or additional skills to enhance current activities or move in a new direction. Graduates may also pursue further education in the form of graduate and professional degrees.

PEO - Graduates Who make Contributions in Research, Innovation, Design and/or Technological Development.

As a result, graduates will make significant or meaningful contributions in their chosen fields, either through publications and/or presentations, the development of a product or process, obtaining patents for new products and/or processes, or other evidence of contributing to the advancement of knowledge, particularly in fields integrating engineering and the life sciences.

PEO - Graduates Who Contribute to Their Communities

As a result, graduates will work independently and in diverse groups to effectively and efficiently achieve personal and organizational goals, manage projects, foster collaborative effort among co-workers, mentor individuals within the organization or in the community, engage in community or public service, create a product or process that fills a social need, and/or participate in educating individuals about an issue of societal concern.

PEO - Graduates Who Practice Ethical Reasoning, Behavior and Professionalism

As a result, graduates will work in the global environment respecting cultural and social differences, managing risk and accepting responsibility, and adhering to the professional codes of conduct appropriate to his or her field of study and/or practice.

Student Learning Outcomes

By participating in the biomedical engineering undergraduate curriculum at the School of Biomedical Engineering, Science and Health Systems and graduating with the Bachelor of Science (BS) degree in Biomedical Engineering from Drexel University, students will be able to:

1. identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics;

2. apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors;

3. communicate effectively with a range of audiences;

4. recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts;

5. function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives;

6. develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions;

7. acquire and apply new knowledge as needed, using appropriate learning strategies;

8. apply knowledge and skills gained from a program of study to the achievement of goals in a work, clinical or other professional setting.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Core Courses

BIO 122	Cells and Genetics	4.5
BIO 201	Human Physiology I	4.0
BIO 218	Principles of Molecular Biology	4.0
BMES 101	Introduction to BMES Design I – Defining Medical Problems	2.0
BMES 102	Introduction to BMES Design II – Evaluating Design Solutions	2.0
BMES 124	Biomedical Engineering Freshman Seminar I	2.0
BMES 201	Programming and Modeling for Biomedical Engineers I	3.0
BMES 202	Programming and Modeling for Biomedical Engineers II	3.0
BMES 238	Dynamics of Biomedical Systems	3.0
or MEM 238	Dynamics	
BMES 241	Modeling in Biomedical Design I	2.0
BMES 302	Laboratory II: Biomeasurements	2.0
BMES 303	Laboratory III: Biomedical Electronics	2.0
BMES 310	Biomedical Statistics	4.0
BMES 315	Experimental Design in Biomedical Research	4.0
BMES 337	Introduction to Physiological Control Systems	3.0
BMES 338	Biomedical Ethics and Law	3.0
BMES 341	Modeling in Biomedical Design II	2.0
BMES 345	Mechanics of Biological Systems	3.0
BMES 375	Computational Bioengineering	4.0
BMES 381	Junior Design Seminar I	2.0
BMES 382	Junior Design Seminar II	2.0
BMES 432	Biomedical Systems and Signals	3.0
BMES 444	Biofluid Mechanics	3.0
BMES 451	Transport Phenomena in Living Systems	4.0
BMES 491 [WI]	Senior Design Project I	3.0
BMES 492	Senior Design Project II	2.0
BMES 493	Senior Design Project III	3.0
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
CHEM 253	Thermodynamics and Kinetics	3.0-4.0
or ENGR 210	Introduction to Thermodynamics	
CIVC 101	Introduction to Civic Engagement	1.0
ECE 201	Foundations of Electric Circuits I	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
ENGR 220	Fundamentals of Materials	4.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 200	Multivariate Calculus	4.0
MATH 201	Linear Algebra	4.0
MATH 210	Differential Equations	4.0
MEM 202	Statics	3.0
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
UNIV R101	The Drexel Experience	1.0

Electives

Bioscience Elective: Choose any BIO course, 200-level or higher		3.0
Bioscience Restricted Elective: Choose 1		3.0
BIO 203	Human Physiology II	
BIO 214	Principles of Cell Biology	
BIO 224	Form, Function & Evolution of Vertebrates	
BIO 244	Genetics I	
BIO 311	Biochemistry	
General Studies Electives (5) *		15.0
Laboratory Electives: Choose 2		4.0
BIO 202	Human Physiology Laboratory	
BIO 215	Techniques in Cell Biology	
BIO 219 [WI]	Techniques in Molecular Biology	
BMES 301	Laboratory I: Experimental Biomechanics	
BMES 304	Laboratory IV: Ultrasound Images	
BMES 305	Laboratory V: Musculoskeletal Anatomy for Biomedical Engineers	
CHEM 244	Organic Chemistry Laboratory I	
CHEM 245	Organic Chemistry Laboratory II	
Concentration Requirements and STEM Electives		**21.0**
Concentration Required Courses (3)		
STEM Electives (up to the 21 credit total)**		
Total Credits		185.5-186.5

* General studies electives include all liberal arts electives plus additional subjects, such as business, which do not fall under the subject areas of science, math or engineering. See the Biomedical Engineering General and Liberal Studies List (http://www.biomed.drexel.edu/new04/Content/ug_prog/gen_lib_studies_courses/) for approved courses. A certain number of General Studies credits are required for graduation with this major.

** STEM electives are defined as any 200-level or higher course offered by the College of Engineering, College of Computing and Informatics, School of Biomedical Engineering, Science and Health Systems, and the School of Public Health; any 200-level or higher course in BIO, CHEM, ENVS, HSCI, MATH, and PHYS; and selected PSY courses.

Concentration Course Requirements

Students must select one concentration and complete the listed required courses. The student also needs to take additional STEM electives, as described above. The credit total of the concentration required courses and the STEM electives must be at least 21.0 credits.

Biomaterials

CHEM 241	Organic Chemistry I	4.0
BMES 460	Biomaterials I	4.0
BMES 461	Biomaterials II	4.0
Total Credits		12.0

Biomechanics

MEM 201	Foundations of Computer Aided Design	3.0
BMES 441	Biomechanics I: Introduction to Biomechanics	4.0
BMES 442	Biomechanics II: Musculoskeletal Modeling and Human Performance	4.0
Total Credits		11.0

Biomedical Imaging

PHYS 201	Fundamentals of Physics III	4.0
BMES 421	Biomedical Imaging Systems I: Images	4.0
BMES 422	Biomedical Imaging Systems II: Ultrasound	4.0
Total Credits		12.0

Biomedical Informatics

BIO 219 [WI]	Techniques in Molecular Biology	3.0
BMES 483	Quantitative Systems Biology	4.0
BMES 484	Genome Information Engineering	4.0
Total Credits		11.0

Neuroengineering

BIO 462	Biology of Neuron Function	3.0
BMES 477	Neuroengineering I: Neural Signals	3.0
BMES 478	Neuroengineering II: Principles of Neuroengineering	3.0
Total Credits		9.0

Tissue Engineering

BIO 219 [WI]	Techniques in Molecular Biology	3.0
BMES 471	Cellular and Molecular Foundations of Tissue Engineering	4.0
BMES 472	Developmental and Evolutionary Foundations of Tissue Engineering	4.0
Total Credits		11.0

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BMES 124	Biomedical Engineering Freshman Seminar I	2.0
BMES 201	Programming and Modeling for Biomedical Engineers I	3.0
CHEM 101	General Chemistry I	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121	Calculus I	4.0
UNIV R101	The Drexel Experience	1.0
	Term Credits	16.5
Term 2		
BMES 101	Introduction to BMES Design I – Defining Medical Problems	2.0
CHEM 102	General Chemistry II	4.5
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122	Calculus II	4.0
PHYS 101	Fundamentals of Physics I	4.0
	Term Credits	17.5
Term 3		
BIO 122	Cells and Genetics	4.5
BMES 102	Introduction to BMES Design II – Evaluating Design Solutions	2.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 200	Multivariate Calculus	4.0
PHYS 102	Fundamentals of Physics II	4.0
CIVC 101	Introduction to Civic Engagement	1.0
	Term Credits	18.5
Term 4		
BMES 202	Programming and Modeling for Biomedical Engineers II	3.0
ECE 201	Foundations of Electric Circuits I	4.0
ENGR 220	Fundamentals of Materials	4.0
MATH 201	Linear Algebra	4.0
MEM 202	Statics	3.0
	Term Credits	18.0
Term 5		
BIO 218	Principles of Molecular Biology	4.0

BMES 238	Dynamics of Biomedical Systems	3.0
or MEM 238	Dynamics	
BMES 338	Biomedical Ethics and Law	3.0
BMES 241	Modeling in Biomedical Design I	2.0
MATH 210	Differential Equations	4.0
	Term Credits	16.0
Term 6		
BIO 201	Human Physiology I	4.0
BMES 345	Mechanics of Biological Systems	3.0
BMES 375	Computational Bioengineering	4.0
BMES 432	Biomedical Systems and Signals	3.0
CHEM 253	Thermodynamics and Kinetics	4.0
	Term Credits	18.0
Term 7		
BMES 303	Laboratory III: Biomedical Electronics	2.0
BMES 310	Biomedical Statistics	4.0
BMES 341	Modeling in Biomedical Design II	2.0
BMES 451	Transport Phenomena in Living Systems	4.0
Bioscience Restricted Elective		3.0
	Term Credits	15.0
Term 8		
BMES 315	Experimental Design in Biomedical Research	4.0
BMES 381	Junior Design Seminar I	2.0
General Studies Electives		6.0
	Term Credits	12.0
Term 9		
BMES 302	Laboratory II: Biomeasurements	2.0
BMES 382	Junior Design Seminar II	2.0
BMES 337	Introduction to Physiological Control Systems	3.0
BMES 444	Biofluid Mechanics	3.0
Bioscience Elective		3.0
Concentration Required Course		3.0
	Term Credits	16.0
Term 10		
BMES 491 [WI]	Senior Design Project I	3.0
Concentration Required Course		3.0
General Studies Elective		3.0
Lab Elective		2.0
STEM Elective		3.0
	Term Credits	14.0
Term 11		
BMES 492	Senior Design Project II	2.0
Concentration Required Course		3.0
General Studies Elective		3.0
Lab Elective		2.0
STEM Elective		3.0
	Term Credits	13.0
Term 12		
BMES 493	Senior Design Project III	3.0
General Studies Elective		3.0
STEM Electives		6.0
	Term Credits	12.0

Total Credit: 186.5

Co-op/Career Opportunities

Metropolitan Philadelphia has one of the highest concentrations of medical institutions and pharmaceutical and biotechnology industries in the nation. The bachelor of science degree in biomedical engineering gives students access to a broad spectrum of career opportunities in medical device and equipment industry; prosthetics and assist devices industry; biomaterials and implants industry; and the telemedicine, pharmaceutical, biotechnology, and agricultural sectors.

Biomedical engineering graduates are also ideally prepared for professional education in medicine, dentistry, veterinary medicine, and law. Those who choose to pursue graduate education can aim for careers in research and development, biomedical technology innovation and transfer, as well as health care technology management.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Biomedical Engineering, Science and Health Systems Faculty

Fred D. Allen, PhD *(University of Pennsylvania) Associate Dean for Undergraduate Education.* . Teaching Professor. Tissue engineering, cell engineering, orthopedics, bone remodeling, wound healing, mechanotransduction, signal transduction, adhesion, migration.

Hasan Ayaz, PhD *(Drexel University) School of Biomedical Engineering, Science and Health Systems.* Associate Professor. Optical brain imaging, cognitive neuroengineering, brain computer interface (BCI), functional ner infrared (fNIR), and near infrared spectroscopy (NIRS).

Sriram Balasubramanian, PhD *(Wayne State University).* Assistant Professor. Structural characteristics of the pediatric thoracic cage using CT scans and developing an age-equivalent animal model for pediatric long bones.

Kenneth A. Barbee, PhD *(University of Pennsylvania) Senior Associate Dean, Associate Dean for Research.* Professor. Cellular biomechanics of neural and vascular injury, mechanotransduction in the cardiovascular system, mechanical control of growth and development for wound healing and tissue engineering.

Paul Brandt-Rauf, MD, DrPH *(Columbia University) Dean.* Distinguished University Professor. Environmental health, particularly the molecular biology and molecular epidemiology of environmental carcinogenesis, and protein engineering for the development of novel peptide therapies for the treatment and prevention of cancer.

Donald Buerk, PhD *(Northwestern University).* Research Professor. Biotechnology, physiology, systems biology, blood flow, microcirculation, nitric oxide, oxygen transport

Jamie Dougherty, PhD *(Drexel University).* Associate Teaching Professor. Brain-computer interface, neural encoding, electrophysiological signal acquisition and processing.

Lin Han, PhD *(Massachusetts Institute of Technology).* Associate Professor. Nanoscale structure-property relationships of biological materials, genetic and molecular origins soft joint tissue diseases, biomaterials under extreme conditions, coupling between stimulus-responsiveness and geometry.

Kurtulus Izzetoglu, PhD *(Drexel University).* Associate Research Professor. Cognitive neuroengineering, functional brain imaging, near infrared spectroscopy, medical sensor development, biomedical signal processing, human performance assessment, and cognitive aging

Andres Kriete, PhD *(University in Bremen Germany) Associate Dean of Academic Affairs*. Teaching Professor. Systems biology, bioimaging, control theory, biology of aging, skin cancer.

Steven Kurtz, PhD *(Cornell University)*. Part-time Research Professor. Computational biomechanics of bone-implant systems and impact-related injuries, orthopaedic biomechanics, contact mechanics, orthopaedic biomaterials, large-deformation mechanical behavior and wear of polymers, and degradation and crosslinking of polyolefins in implant applications.

Peter Lewin, PhD *(University of Denmark, Copenhagen-Lyngby) Richard B. Beard Professor, School Of Biomedical Engineering, Science & Health Systems*. Professor. Biomedical ultrasonics, piezoelectric and polymer transducers and hydrophones; shock wave sensors.

Hualou Liang, PhD *(Chinese Academy of Sciences)*. Professor. Neuroengineering, neuroinformatics, cognitive and computational neuroscience, neural data analysis and computational modeling, biomedical signal processing.

Donald L. McEachron, PhD *(University of California at San Diego) Coordinator, Academic Assessment and Improvement*. Teaching Professor. Animal behavior, autoradiography, biological rhythms, cerebral metabolism, evolutionary theory, image processing, neuroendocrinology.

Michael Neidrauer, PhD *(Drexel University)*. Assistant Research Professor. Wound healing, near infrared, spectroscopy, cell culture, data analysis, optical coherence tomography (OCT), matlab, life sciences assay development, confocal microscopy, biomaterials, in-vivo, medical devices

Banu Onaral, PhD *(University of Pennsylvania) H.H. Sun Professor; Senior Advisor to the President, Global Partnerships*. Professor. Biomedical signal processing; complexity and scaling in biomedical signals and systems.

Kambiz Pourrezaei, PhD *(Rensselaer Polytechnic University)*. Professor. Thin film technology; nanotechnology; near infrared imaging; power electronics.

Christopher Rodell, PhD *(University of Pennsylvania)*. Assistant Professor. Biomaterials, supramolecular chemistry, and drug delivery. Therapeutic applications including the etiology of disease, organ injury, cardiovascular engineering, immune engineering, and biomedical imaging.

Ahmet Sacan, PhD *(Middle East Technical University)*. Associate Teaching Professor. Indexing and data mining in biological databases; protein sequence and structure; similarity search; protein structure modeling; protein-protein interaction; automated cell tracking.

Joseph J. Sarver, PhD *(Drexel University)*. Teaching Professor. Neuromuscular adaptation to changes in the myo-mechanical environment.

Patricia A. Shewokis, PhD *(University of Georgia)*. Professor. Roles of cognition and motor function during motor skill learning; role of information feedback frequency on the memory of motor skills, noninvasive neural imaging techniques of functional near infrared spectroscopy(fNIRS) and electroencephalograpy (EEG) and methodology and research design.

Adrian C. Shieh, PhD *(Rice University)*. Associate Teaching Professor. Contribution of mechanical forces to tumor invasion and metastasis, with a particular emphasis on how biomechanical signals may drive the invasive switch, and how the biomechanical microenvironment interacts with cytokine signaling and the extracellular matrix to influence tumor and stromal cell behavior.

Wan Y. Shih, PhD *(Ohio State University)*. Professor. Piezoelectric microcantilever biosensors development, piezoelectric finger development, quantum dots development, tissue elasticity imaging, piezoelectric microcantilever force probes.

Kara Spiller, PhD *(Drexel University)*. Associate Professor. Macrophage-biometerial interactions, drug delivery systems, and chronic would healing. Cell-biomaterial interactions, biomaterial design, and international engineering education.

Marek Swoboda, PhD *(Drexel University)*. Assistant Teaching Professor. Cardiovascular engineering, cardiovascular system, diagnostic devices in cardiology, piezoelectric biosensors, and pathogen detection.

Amy Throckmorton, PhD *(University of Virginia)*. Associate Professor. Computational and experimental fluid dynamics; cardiovascular modeling, including transient, fluid-structure interaction, and patient-specific anatomical studies; bench-to-bedside development of medical devices; artificial organs research; prediction and quantification of blood trauma and thrombosis in medical devices; design of therapeutic alternatives for patients with dysfunctional single ventricle physiology; human factors engineering of mechanical circulatory assist devices

Bhandawat Vikas, PhD *(Johns Hopkins School of Medicine)*. Associate Professor. Sensorimotor integration, whole-cell patch clamp and imaging in behaving animals, optogenetics, neuromechanics, locomotion.

Bhandawat Vikas Associate Professor. Sensorimotor integration, whole-cell patch clamp and imaging in behaving animals, optogenetics, neuromechanics, locomotion

Margaret Wheatley, PhD *(University of Toronto) John M. Reid Professor*. Ultrasound contrast agent development (tumor targeting and triggered drug delivery), controlled release technology (bioactive compounds), microencapsulated allografts (ex vivo gene therapy) for spinal cord repair.

Ming Xiao, PhD *(Baylor University)*. Associate Professor. Nanotechnology, single molecule detection, single molecule fluorescent imaging, genomics, genetics, genome mapping, DNA sequencing, DNA biochemistry, and biophysics.

Yinghui Zhong, PhD *(Georgia Institute of Technology)*. Assistant Professor. Spinal cord repair, and engineering neural prosthesis/brain interface using biomaterials, drug delivery, and stem cell therapy.

Leonid Zubkov, PhD, DSc *(St. Petersburg State University, Russia)*. Research Professor. Physiology, wound healing, physiologic neovascularization, near-infrared spectroscopy, optical tomography, histological techniques, computer-assisted diagnosis, infrared spectrophotometry, physiologic monitoring, experimental diabetes mellitus, penetrating wounds, diabetes complications, skin, animal models, radiation scattering, failure analysis

Catherin von Reyn, PhD *(University of Pennsylvania)*. Assistant Professor. Cell type-specific genetic engineering, whole-cell patch clamp in behaving animals, modeling, and detailed behavioral analysis to identify and characterize sensorimotor circuits.

Emeritus Faculty

Dov Jaron, PhD *(University of Pennsylvania) Calhoun Distinguished Professor of Engineering in Medicine.* Professor Emeritus. Mathematical, computer and electromechanical simulations of the cardiovascular system.

Rahamim Seliktar, PhD *(University of Strathclyde, Glasgow).* Professor Emeritus. Limb prostheses, biomechanics of human motion, orthopedic biomechanics.

Hun H. Sun, PhD *(Cornell University).* Professor Emeritus. Biological control systems, physiological modeling, systems analysis.

The School of Education

The School of Education offers Pennsylvania Department of Education-approved programs to certify students who want to become teachers. Undergraduate students have the option to choose from a variety of traditional full-time and non-traditional part-time on-campus and online programs. These programs are designed to meet the needs of a variety of diverse learners who wish to pursue a bachelor's degree and Pennsylvania State Certification in elementary (grades Prek-4), middle level (grades 4-8) and/or secondary (grades 7-12).

School of Education undergraduate students have the option to choose from the following program options: BS on-campus (full or part-time) taking day or evening courses, or the part-time Online BS Degree completion program. In addition, any Drexel non-education undergraduate student who is interested in becoming a teacher has the option to enroll in either the BS/MS or BA/MS Dual Degree programs (4 or 5 year options) regardless of their major.

The School of Education (http://www.drexel.edu/soe/) seeks to enrich knowledge and practice related to lifespan learning, based on the most current and appropriate research and practice. Our goal is to improve human understanding through programs and activities that emphasize creative uses of human effort, technology, leadership, and problem solving.

Majors

- Design of Learning Technologies (BS) (p. 428)
- Elementary Education (BS) (p. 432)
-   - PK-4 (p. 434)
    - PK-4 and Special Education (p. 438)
    - Middle Level Math and English (p. 442)
    - Middle Level Science and Math (p. 446)
    - Middle Level Science and English (p. 450)
- *NEW:* Education: Non-Certification (BS)
- Teacher Education (BS) (p. 456)
    - Biology (p. 459)
    - Chemistry (p. 463)
    - Earth and Space Science (p. 466)
    - English (p. 470)
    - General Science (p. 474)
    - Mathematics (p. 477)
    - Physics (p. 481)
    - Social Studies (p. 485)

Minor

- *NEW:* Design of Learning Technologies
- Education (p. 489)
- Sport Coaching Leadership (p. 489)
- STEM Education (p. 489)

Certificates

- Creativity and Innovation (p. 490)

About the Curriculum

The School of Education's programs apply the most updated trends in theory, instruction, and leadership, with an emphasis on effective teaching integrating the sciences, enhancing teaching by using technology, two central components of every Drexel Education. In addition, this is the only such program in the country to incorporate a six-month paid internship in industry related to the student's area of certification or individual interest.

Certification for classroom instruction is organized according to the two majors, the BS in Elementary Education and the BS in Secondary Education. Below is a list of all certification areas currently offered by the School of Education.

- Elementary education
    - Elementary: PK-4
    - Elementary: PK-4 and Special Education
    - Middle Level Math and English
    - Middle Level Science and English
    - Middle Level Science and Math
- Secondary education (grades 7-12)
    - Biology
    - Chemistry
    - Earth and Space Science
    - English
    - General Science
    - Mathematics
    - Physics
    - Social Studies
    - Environmental Education (grades K-12)

Students may acquire certification in more than one subject area.

The School of Education uses university-wide resources to prepare fully qualified teachers at both the elementary and secondary levels. The Teacher Education Program at Drexel University is closely aligned with National INTASC Teaching Standards as well as the Pennsylvania Department of Education's Four Domains for Professional Teaching. In addition, the Teacher Ed Program has identified seven *Program Outcomes*, which identify the specific qualities that set the Drexel Teacher Candidate apart from other candidates in the field. These program outcomes are directly aligned with the Drexel University Student Learning Priorities (DSLP). It is expected that students exiting the Teacher Education Program at Drexel University will exhibit these seven standards in his/her professional teaching practice.

Program Outcomes:

1. The teacher candidate demonstrates independent and creative academic leadership skills that can be applied in the classroom, school community and the profession.

2. The teacher candidate understands the changing role of the educator in an increasingly diverse society, and applies this understanding in the classroom, school community and profession.

3. The teacher candidate holds a global perspective on current issues in education, understands best pedagogical practices, and utilizes this knowledge in the classroom, school community and profession.

4. The teacher candidate recognizes the importance of the application of educational research as a tool to explore critical aspects of teaching and learning in PK-12 setting.

5. The teacher candidate demonstrates a strong academic background in all subject areas that meet PDE content requirements, with strong emphasis on mathematics and science.

6. The teacher candidate can effectively integrate tools of technology in curriculum, assessment and instruction to enhance PK-12 student learning.

7. The teacher candidate demonstrates the ability to reflect upon one's professional practice through the successful completion of course work and engagement in experiential learning to promote positive, transformative change within the profession.

Pennsylvania Instructional I Teaching Certifications

There are multiple ways for Drexel University students to obtain their initial and add-on teaching certifications in Pennsylvania while pursuing their current major at Drexel. Education majors have the opportunity to achieve these certifications through the Bachelors of Science Education program, the BS/MS dual degree, the graduate level Post-baccalaureate (PBC) and Masters (MS) in Teaching Learning and Curriculum programs.

Non-teaching education majors may have the opportunity to build teacher certification into their program of study as electives, depending on their major. Those students who cannot manage the whole certification program may opt to participate in the (non-certification) education minor. Undergraduate students also have the option to enroll in as many content courses as can be managed in their undergraduate degree and then finish their teaching certification requirements through the Post-baccalaureate Teaching Certification or Masters in Teaching Learning and Curriculum programs. Additionally, undergraduate non-education majors can pursue a Master's degree in Teaching, Learning, and Curriculum with Teaching Certification through the BA/MS or BS/MS dual degree route while in their current major provided they meet and maintain the program's minimum criteria of a 3.0 cumulative GPA requirement and have completed no more than 90-120 credits at Drexel at the time of applying for the dual degree program.

*Please note that during a Drexel student's senior year, undergraduate students have the option to take up to and including 9 graduate credits in core pedagogy education courses that can be applied to a future graduate level Post-baccalaureate Teacher Certification or MS degree program at Drexel provided that these graduate credits are not required for UG degree completion and the student received a minimum grade of a "B" in those graduate courses.

Please be advised that the Pennsylvania Department of Education requires that all teacher certification candidates must maintain a 3.0 GPA in their degree or certification program in order to be recommended for state certification.

Combination certifications are available from the School of Education. Sample combinations include:

- Grades PreK-4 certification, with certification in Special Education.
- Biology certification, with courses for additional certification in chemistry.
- Chemistry certification, with courses for additional certification in biology.

- Earth and space science certification, with courses for additional certification in chemistry.
- Earth and space science certification, with courses for additional certification in physics.
- Mathematics certification, with courses for additional certification in physics.
- Physics certification, with courses for additional certification in mathematics.

Students pursuing the appropriate majors in the College of Arts and Sciences may also complete the requirements for certification within their area of study.
For more information, please contact the Program Manager or the School of Education at 215.895.6770.

Post-Graduate Opportunities

Students obtain employment in the School District of Philadelphia and neighboring school districts in Pennsylvania and such surrounding states as New Jersey, Delaware, Ohio, and New York. Often, students begin a graduate degree program in combination with their employment.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List on the Drexel University Writing Center web page. Students scheduling their courses in Banner/DrexelOne can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Cooperative Education

Drexel University has long been known for its co-operative education program, through which students combine periods of full-time, career-related employment with their studies. Internship employment is a requirement for all teacher education majors.

The BS degree is completed in four years. In addition to the Pennsylvania Department of Education's (PDE) state mandated field experiences and 12 week student teaching, this program includes one six-month internship period of full-time employment related to the student's initial area of teacher certification. The goal of the co-op program in teacher education is to provide real-world experiences for future teachers to use in their classrooms.

Students typically participate in co-ops during their fall and winter terms of their sophomore year and pursue varied positions geared directly to their area(s) of certification. Candidates are asked to pursue a position that would allow them to see other areas of education that reach beyond K-12 teaching. This caveat to the requirement allows candidates to understand the broadness and extensive nature of the field of education both nationally and internationally.

Students have interned in a variety of institutions or museums such as the Philadelphia School District, the Philadelphia's Please Touch Museum, Drexel's Academy of Natural Science (http://www.ansp.org/) Museum (http://www.ansp.org/), the Philadelphia Dream Academy, Children's Hospital of Philadelphia, and the Franklin Institute Science Museum just to name a few.

While the BS/MS 5 year dual degree program offers both a co-op, PA state mandated field experiences and student teaching, the BS/MS 4 year dual degree program only requires the PA state mandated field experiences and student teaching, not a co-op experience.

Facilities

The Drexel Center for the Prevention of School-aged Violence is located within the School of Education at Drexel University, 3141 Chestnut Street, Philadelphia, PA 19104. The mission of the center is to create public awareness around the need for youth-focused, evidence-based efforts aimed at preventing youth violence from occurring in environments where youth grow, learn, and recreate.

Our vision is to help ensure that all youth possess the requisite social and cognitive skills to prevent violence on their own, which includes developing conflict resolution and mediation skills. We also strive to inform policy leaders and stakeholders of the various types of evidence-based activities that prevent school-aged violence.

The Math Forum is a leading center for mathematics and mathematics education on the Internet. Operating under Drexel's School of Education, our mission is to provide resources, materials, activities, person-to-person interactions, and educational products and services that enrich and support teaching and learning in an increasingly technological world.

For more information about these and other School of Education centers, visit the School of Education (http://www.drexel.edu/soe/) website.

Design of Learning Technologies

Major: Design of Learning Technologies
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 13.0607
Standard Occupational Classification (SOC) code: 25-9099

About the Program

The Bachelor of Science major in Design of Learning Technologies (DLT) prepares students to build the next generation of information and computing technology for learning. Students learn interdisciplinary skills and knowledge necessary to design, develop, and implement technology-enhanced learning environments for a variety of settings.

Students in the major will be exposed to three major themes in their coursework:

- **Cognition and Learning**: Cognitive/mental processes and representations underlying knowledge and skill acquisition
- **Culture and Society:** Social, cultural, and organizational aspects of teaching and learning, in and outside of schools

- **Design and Technology:** Design and evaluation techniques to enable the development of new and emerging technologies to support learning and teaching

Work across these themes is coordinated to facilitate the development of expertise on the design of learning technologies grounded in strong theories of learning for a wide range of educational contexts (e.g., classrooms, museum exhibits, after-school, summer camps, etc.), audiences (e.g., teachers, students, corporations, children, adults, etc.), and learning environments.

The curriculum combines knowledge of how people learn, learning technology design, and child/adolescent development from the School of Education with design courses in the Westphal College of Media Arts & Design and computational thinking courses in the College of Computing and Informatics. Co-op experiences may include work at software and design companies, non-profits, cultural institutions, or research environments where there are needs for individuals with training in both learning theories and computational design.

Graduates of the program will have strong skills in applying theory to the creation of educational and learning environments. With hands-on courses focused on human learning and technology design, the Design of Learning Technologies major combines expertise in the foundations of education with design and technical expertise that is central for best practices of the application, development, and use of technologies throughout our lifetimes.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Requirements

ANTH 101	Introduction to Cultural Diversity	3.0
BIO 100	Applied Cells, Genetics & Physiology	3.0
BIO 101	Applied Biological Diversity, Ecology & Evolution	3.0
CHEM 111	General Chemistry I	4.0
COM 111	Principles of Communication	3.0
CRTV 301	Foundations in Creativity	3.0
CRTV 303	Creativity in the Workplace	3.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
Literature Requirement (Select one from ENGL 200 - ENGL 335)		3.0
American History Requirement (Select one from HIST 201 - HIST 203)		3.0
INFO 105	Introduction to Informatics	3.0
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
MUSC 130	Introduction to Music	3.0
PHYS 151	Applied Physics	0.0-3.0
PSY 101	General Psychology I	3.0
PSY 330	Cognitive Psychology	3.0
SOC 335	Sociology of Education	3.0
Education Requirements		
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0

EDUC 102	Foundations in Education II: Contemporary Issues	3.0
EDLT 103	Foundation in Education III: Learning Sciences	3.0
EDUC 105	Freshman Pedagogy Seminar [*]	3.0
EDUC 120	Child Development I: Typical Development	3.0
EDUC 123	Adolescent Development	3.0
EDUC 201	Instructional Issues	3.0
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 322	Evaluation of Instruction	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 335	Engaging the Learner	3.0

Design of Learning Technologies Program Requirements

ANTH 370	Ethnographic Methods	3.0
CS 140	Computer Science Principles	3.0
DIGM 223	Creative Concept Design	3.0
EDLT 101	Learning, Culture & Technology Workshop I	3.0
EDLT 201	Learning, Culture and Technology Workshop II	3.0
EDLT 238	New Media Literacies	3.0
EDLT 250	Sociocultural Perspectives on Learning	3.0
EDLT 301	Learning, Culture & Technology Workshop III	3.0
EDLT 339	Future Pedagogies	3.0
EDLT 353	Play and Learning in Participatory Cultures	3.0
EDLT 354	Learning In and Out of Schools	3.0
EDLT 491	Senior Project I	3.0
EDLT 492	Senior Project II	3.0
EDLT 493	Senior Project III	3.0
EHRD 205	Organizational Learning & Strategy	3.0
INFO 110	Introduction to Human-Computer Interaction	3.0
INFO 240	Introduction to Data Science	
WEST 465	Special Topics in Media, Arts and Design	3.0
Electives [**]		**24.0**

Other University Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
UNIV T101	The Drexel Experience	1.0
Total Credits		174.0-177.0

[*]   Students enroll in EDUC 105 three times; Fall, Winter and Spring of Freshman Year.

[**]   Students are encouraged to work with their advisor to select electives or a minor.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
EDLT 101	Learning, Culture & Technology Workshop I	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 120	Child Development I: Typical Development	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
UNIV T101	The Drexel Experience	1.0
	Term Credits	14.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
CS 140	Computer Science Principles	3.0
EDUC 102	Foundations in Education II: Contemporary Issues	3.0

EDUC 105	Freshman Pedagogy Seminar	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 101	Introduction to Analysis I	4.0
	Term Credits	15.0
Term 3		
COM 111	Principles of Communication	3.0
EDLT 103	Foundation in Education III: Learning Sciences	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
INFO 110	Introduction to Human-Computer Interaction	3.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	17.0
Term 4		
DIGM 223	Creative Concept Design	3.0
EDLT 201	Learning, Culture and Technology Workshop II	3.0
INFO 105	Introduction to Informatics	3.0
PSY 101	General Psychology I	3.0
PHYS 151	Applied Physics	0.0-3.0
	Term Credits	12.0-15.0
Term 5		
CRTV 301	Foundations in Creativity	3.0
ECON 201	Principles of Microeconomics	4.0
EDLT 238	New Media Literacies	3.0
EHRD 205	Organizational Learning & Strategy	3.0
	Term Credits	13.0
Term 6		
ANTH 101	Introduction to Cultural Diversity	3.0
BIO 100	Applied Cells, Genetics & Physiology	3.0
COOP 101	Career Management and Professional Development	0.0
EDLT 339	Future Pedagogies	3.0
EDUC 123	Adolescent Development	3.0
SOC 335	Sociology of Education	3.0
	Term Credits	15.0
Term 7		
BIO 101	Applied Biological Diversity, Ecology & Evolution	3.0
EDLT 353	Play and Learning in Participatory Cultures	3.0
EDUC 201	Instructional Issues	3.0
ENGL 200 - ENGL 335		3.0
Free Elective		3.0
	Term Credits	15.0
Term 8		
CRTV 303	Creativity in the Workplace	3.0
EDLT 301	Learning, Culture & Technology Workshop III	3.0
EDLT 354	Learning In and Out of Schools	3.0
HIST 201 - HIST 203		3.0
Free electives		3.0
	Term Credits	15.0
Term 9		
EDLT 250	Sociocultural Perspectives on Learning	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 335	Engaging the Learner	3.0
Free electives		6.0
	Term Credits	15.0
Term 10		
CHEM 111	General Chemistry I	4.0
EDLT 491	Senior Project I	3.0
INFO 240	Introduction to Data Science	
PSY 330	Cognitive Psychology	3.0

WEST 465	Special Topics in Media, Arts and Design	3.0
	Term Credits	13.0
Term 11		
ANTH 370	Ethnographic Methods	3.0
EDLT 492	Senior Project II	3.0
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 322	Evaluation of Instruction	3.0
Free elective		3.0
	Term Credits	15.0
Term 12		
EDLT 493	Senior Project III	3.0
MUSC 130	Introduction to Music	3.0
Free electives		9.0
	Term Credits	15.0

Total Credit: 174.0-177.0

Education Faculty

Jennifer Adams, EdD *(Harvard University)*. Associate Professor. Comparative and international education; Poverty and education; Child welfare; Educational policy.

Ayana Allen, PhD *(Texas A&M University)*. Assistant Professor. Urban education; Identity construction in school contexts; Urban school transformation.

Kristen Betts, EdD *(George Washington University)*. Clinical Professor. Higher education administration and governance, online blended education, instructional design and educational technology, program assessment and evaluation.

Eric Brewe, PhD *(Arizona State University)*. Associate Professor. Physics Education Research, introductory course reform, network analysis in learning, neuromechanisms of learning.

José Luis Chávez, EdD *(University of Southern California)*. Clinical Professor. Higher education leadership and administration.

Rebecca Clothey, PhD *(University of Pittsburgh)*. Associate Professor. Comparative and international education, education of ethnic and linguistic minorities, sociology of education.

James Connell, PhD *(Louisiana State University) Founding Clinical Core Director and Research Fellow, A.J. Drexel Autism Institute*. Associate Professor. Identifying the variables that influence adult behavior change in community settings; autism intervention; widespread dissemination of evidence-based interventions in school and community settings.

Kareem Edouard, PhD *(Stanford University)*. Assistant Professor. Educational technology; internet-based STEM learning; equity and inclusion in STEM education

Salvatore V. Falletta, EdD *(North Carolina State University)*. Clinical Professor. Human Resource intelligence (i.e., HR research and analytics practices); HRD assessment, measurement, and evaluation models and taxonomies; organizational diagnostic models; web-based employee and organizational survey methods, and computational modeling.

Alonzo M. Flowers, III, PhD *(Texas A&M University)*. Associate Professor. Education issues including academic identity development of men of color in STEM education, diversity in teaching & learning, research methods/ design, and college student development in higher education

Aroutis N. Foster, PhD *(Michigan State University)*. Associate Professor. Educational psychology and educational technology, especially the

following: Motivation; Technological Pedagogical Content Knowledge (TPACK); Immersive Interactive Digital Environments (simulation, games, virtual realities.

Kathy Geller, PhD *(Fielding Graduate University)*. Associate Clinical Professor. Educational leadership and management.

Rajashi Ghosh, PhD *(University of Louisville, Kentucky) Department Chair for Policy, Organization & Leadership*. Associate Professor. Mentoring and leader development, workplace Incivility, workplace learning and development.

John M. Gould, PhD *(University of Pittsburgh) Harrisburg EdD Educational Leadership & Change Program*. Clinical Professor. Change leadership, curriculum re-design, the impact of technology on learning.

Dominic F. Gullo, PhD *(Indiana University)*. Professor. Studying the relative and long-range effects of early schooling experiences in prekindergarten and kindergarten on children's achievement and social adaptation to school routine.

H. Bernard Hall, PhD *(Temple University)*. Assistant Professor. Hip-hop Pedagogy , English Education, Urban Teacher Education.

Penny Hammrich, PhD *(University of Minnesota) Dean*. Distinguished University Professor. Urban education; science education; genetics; gender equity; science knowledge for conceptual teaching; sport science.

Paul Harrington, PhD *(University of Massachusetts, Boston) Director, Center for Labor Markets and Policy*. Professor. Teen and young adult job access; economic outlook, college labor market; workforce development, planning, and development; vocational rehabilitation and job market transition.

Michael J. Haslip, PhD *(Old Dominion University)*. Assistant Professor. Early childhood education, social and emotional learning, child guidance strategies, effects of public pre-school attendance.

Deanna Hill, JD, PhD *(University of Pittsburgh)*. Associate Clinical Professor. Higher education, international education, education law, education policy

Erin Horvat, PhD *(University of California, Los Angeles) Senior Vice Provost for Faculty Affairs*. Professor. Urban education, access and equity, high school dropout, parent involvement/family involvement, community engagement in research.

Jennifer Katz-Buonincontro, PhD *(University of Oregon) Associate Dean of Research*. Associate Professor. Educational administration, leadership development, survey & instrument design.

Larry Keiser, PhD *(Drexel University)*. Associate Clinical Professor. Education and corporate/business leaders' creativity and entrepreneurial mindsets; creative school/work environments; neuroscience of creativity; everyday creativity for teachers and educators.

Kristine Kelly, PhD *(University of Wisconsin, Madison)*. Associate Clinical Professor. Sociology of gender and development; anthropology of policy; comparative and international education; qualitative research methods; Vietnam and Southeast Asia.

Cameron Kiosoglous, PhD *(Virginia Tech University) Program Director*. Assistant Clinical Professor. Coached on the USRowing National Team staff since 2002, including the 2004, 2008, 2012, and 2016 Olympic Games; coaching development; measuring coaching quality; self-insight

and reflective practices; coaching leadership; conference presenter; published author.

Valerie Klein, PhD *(Amherst College)*. Associate Clinical Professor. Mathematics learning and teaching; teacher's use of formative assessment in mathematics; creating opportunities for rich problem solving in the classroom; examining teachers growth and change; qualitative research methods.

Michael G. Kozak, Ed.D. *(Rowan University)*. Assistant Clinical Professor. Leadership, STEAM, online and blended learning environments, systems thinking, experiential learning, K-12 education, and facilitating change

Amanda Lannie, PhD *(Syracuse University)*. Assistant Clinical Professor. Applied behavior analysis and special education; School-based consultation; system-wide interventions as a mechanism for delivery supports to all students; Designing effective and efficient interventions for students with emotional/behavioral disorders.

Vera Lee, EdD *(University of Pennsylvania)*. Assistant Clinical Professor. Practitioner Research in online courses to explore inservice/preservice teachers' emerging understandings about issues of diversity; the development of information/digital literacies of urban youth; English language learners.

Bruce Levine, JD *(New York University)*. Associate Clinical Professor. Educational policy, school law, public-private partnerships, intersection of business and education.

Kristine Lewis-Grant, PhD *(Temple University)*. Clinical Professor. Experiences of students of African descent at predominantly white colleges and universities, college access and college student development, youth civic engagement in urban school reform, qualitative research and evaluation.

William Lynch, PhD *(University of Maryland)*. Professor. Curriculum and educational leadership, educational technology, distance learning policy development, higher and adult education.

Constance Lyttle, PhD, JD *(University of Pittsburgh, Duquesne University)*. Clinical Professor. Legal rights of gifted and talented children and children with disabilities; inclusive education of exceptional children; special education mediation; special education IEP/IFSP facilitation; resolution session facilitation

Joy Phillips, PhD *(The University of Texas at Austin)*. Associate Clinical Professor. Visionary leadership in theory and practice, school reform as innovative problem-setting, thinking qualitatively about school reform. thinking about school reform by drawing, Educational Leadership Program Assessment.

Joyce Pittman, PhD *(Iowa State University of Science and Technology)*. Clinical Professor. Curriculum and instruction K-16; teaching English as a foreign language (TEFL); instructional design business education and administration; industrial and career technology; oral and written communication; research methodology; instructional and assistive technology assessment; online learning pedagogy

Kathleen Provinzano, PhD *(Marywood University)*. Assistant Professor. Educational administration.

Lori Severino, EdD *(Neumann University)*. Assistant Professor. Special education, differentiated instruction, reading, Wilson language, multi-

sensory instruction, reading comprehension, assessment, adolescent literacy.

Jason Silverman, PhD *(Vanderbilt University)*. Professor. Teaching and learning of advanced mathematical ideas (algebra and calculus); improving teachers' ability to orchestrate and sustain inquiry-based and discussion-based instruction; technology in mathematics education.

Joanne Sloand, EdD *(Duquesne University) Department Chair for Teaching, Learning & Curriculum*. Associate Clinical Professor. Special Education Leadership, Trauma-informed care, Parent engagement in special education service delivery.

Brian Smith, PhD *(Northwestern University) Senior Associate Dean of Academic Affairs*. Professor. Design of computer-based learning environments, computer science education, human-computer interaction, creativity and innovation; design sciences; informal/everyday learning.

Toni A. Sondergeld, PhD *(University of Toledo)*. Associate Professor. Cognitive and affective assessment development; program/grant evaluation; high stakes testing measurement; STEM education; urban education

Nancy Butler Songer, PhD *(University of California, Davis)*. Distinguished Professor. STEM education, urban education, educational assistance

Bridget Sweeney Blakely, PhD *(Temple University)*. Assistant Clinical Professor. Consultation; Positive Behavior Interventions and Supports (PBIS); Response to Intervention (Rtl); Systems-level change; performance feedback

Mary Jean Tecce DeCarlo, EdD *(University of Pennsylvania)*. Associate Clinical Professor. Early literacy development, learning differences, knowledge construction, urban education.

Sarah P. Ulrich, EdD *(Saint Joseph's University) Associate Dean of Teacher Education and Undergraduate Affairs*. Clinical Professor. Cross-cultural, language and academic development, school reform, teacher preparation, teacher retention, teacher residencies in urban contexts.

Sheila Vaidya, PhD *(Temple University)*. Professor. Educational psychology, school psychology, research design.

Christina Vorndran, PhD *(Louisiana State University) Program Director, Applied Behavior Analysis and Special Education*. Clinical Professor. Designing effective and efficient community-based interventions, Severe behavior disorders, Functional behavior assessment

Christopher G. Wright, PhD *(Tufts University)*. Assistant Professor. Engineering and science education, Urban education, elementary teacher education.

Emeritus Faculty

Mary Jo Grdina, PhD *(Case Western Reserve University)*. Clinical Professor. Undergraduate studies, science education, curriculum design.

Fredricka K. Reisman, PhD *(Syracuse University) Director of the Torrance Center for Creativity and Innovation*. Professor Emeritus. Mathematics education, learning mathematics, mathematics pedagogy, teacher education, heuristic diagnostic learning and teaching, theory and research in creativity and applied creativity.

Elementary Education

Major: Elementary Education
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.0 - 188.5
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 13.1202; 13.1311; 13.1316
Standard Occupational Classification (SOC) code: 25-2022

About the Program

Elementary school teachers instruct classes of children in several subjects. Often they work as part of a team with other teachers who are jointly responsible for a group of students in at least one subject.

The BS in Elementary Education uses university-wide resources to prepare fully qualified teachers at the primary education levels. Candidates in the School of Education participate in one six-month cooperative education (co-op) experience in a professional position related to their area of certification.

Primary teacher certification options include:

- Pre-Kindergarten - Grade 4 (p. 434)
- Pre-Kindergarten - Grade 4 & Special Education (p. 438)
- Middle Level (grades 4-8) Mathematics and English (p. 442)
- Middle Level (grades 4-8) Science and English (p. 450)
- Middle Level (grades 4-8) Science and Mathematics (p. 446)

Candidates may acquire certification in more than one subject area.

The program requires that candidates have a B average (3.0 GPA) in content courses needed for teacher certification in addition to the grade of B or better in each EDEX, EDLT, EDUC and MTED course throughout their time in the program. These requirements must be satisfied in order for Drexel to recommend the candidate for teacher certification upon graduation and/or be considered to have completed the program.

A benchmark to assist candidates in meeting the GPA and B grade requirements is the formal review of each candidate's content and pedagogy coursework at the end of the sophomore year. Candidates who meet these requirements, as well as pass the Basic Skills Exams; *Pre-service Academic Performance Assessment (PAPA) Reading, Writing and Mathematics test modules of the Pennsylvania Educator Certification Tests (PECT) Exams or the Core Academic Skills Tests for Educators in Reading, Writing and Mathematics test modules of the Praxis Exams* according to Pennsylvania standards at that time, are officially accepted into Drexel's Teacher Preparation Program. Candidates who do not meet the requirements work with their academic advisor to develop a plan of action to work toward meeting the requirements or continue in the program to work toward the BS degree without being recommended for a teaching certificate, or explore another major.

Candidates participate in classroom observations and limited direct teaching experiences as a component of many of their pedagogy courses beginning in their freshman or first year. Candidates have the option of the following teacher certification/concentration tracks within their major which determines their individual program of study:

Elementary Education, Pre-Kindergarten through Grade 4: Focused study to work with children in pre-kindergarten, kindergarten, and grades 1-4 across subject areas (ages 3-9). The competencies for this concentration include child development (birth through age 5), language development, early literacy and math foundations for preschool years, early intervention, integrating the arts for the developing child and family and community partnerships.

Elementary Education, Pre-Kindergarten through Grade 4 and Special Education: Focused study to work with children in pre-kindergarten, kindergarten, and grades 1-4 across subject areas (ages 3-9) within the competencies listed previously as well as working with students with disabilities in pre-kindergarten, kindergarten and grades 1-8 (ages 3-14). The special education competencies emphasize the Response to Intervention process, working with students at risk for and with/without disabilities, progress monitoring techniques, research-based instructional practices and interventions.

The Pennsylvania Department of Education (PDE) is currently in the process of restructuring its requirements for Special Education Certification, grades PK-8 and grades 7-12. While the requirements are mandated by the PDE, the School of Education is committed to working with both current and new candidates to fulfill the competencies as required. For additional information, please contact the School of Education's undergraduate Academic Advising Department at 215-895-6770.

Elementary Education, Middle Level: Focused study to work with students in grades 4-6 across subjects and with students in grades 7-8 in two core academic subject(s) the teacher education candidate chooses to pursue:

- Middle School Mathematics & English
- Middle School Science & English
- Middle School Science & Math

In the senior year, candidates who are officially accepted into the Teacher Preparation Program and maintain the 3.0 GPA and grade requirements, enroll and complete the 24-week, full-time, student-teaching experiences in their primary area of certification. Candidates must receive a grade of at least B in (and if applicable) and in all pedagogy (EDEX, EDLT, EDUC and MTED) coursework, as well as maintain an overall 3.0 GPA and pass the appropriate Pennsylvania licensing exams required for the candidate's area of certification to be recommended for teacher certification.

Non-certification Education Concentration Option: Candidates who were not officially accepted into the Teacher Preparation Program and/or do not maintain the GPA and grade requirements but who are working towards the BS degree without being recommended for teacher certification take other courses as assigned by the Teacher Education Program Director and/or academic advisor to fulfill needed credits for the degree in lieu of pre-student teaching and student teaching.

Candidates pursuing the appropriate majors in the College of Arts and Sciences may also complete the requirements for certification within their area of study. For more information, contact the Program Coordinator for the School of Education at 215-895-6770.

Additional Information

Additional information is available at the School of Education's (http://www.drexel.edu/soe/) web site.

Education Faculty

Jennifer Adams, EdD *(Harvard University)*. Associate Professor. Comparative and international education; Poverty and education; Child welfare; Educational policy.

Ayana Allen, PhD *(Texas A&M University)*. Assistant Professor. Urban education; Identity construction in school contexts; Urban school transformation.

Kristen Betts, EdD *(George Washington University)*. Clinical Professor. Higher education administration and governance, online blended education, instructional design and educational technology, program assessment and evaluation.

Eric Brewe, PhD *(Arizona State University)*. Associate Professor. Physics Education Research, introductory course reform, network analysis in learning, neuromechanisms of learning.

José Luis Chávez, EdD *(University of Southern California)*. Clinical Professor. Higher education leadership and administration.

Rebecca Clothey, PhD *(University of Pittsburgh)*. Associate Professor. Comparative and international education, education of ethnic and linguistic minorities, sociology of education.

James Connell, PhD *(Louisiana State University) Founding Clinical Core Director and Research Fellow, A.J. Drexel Autism Institute*. Associate Professor. Identifying the variables that influence adult behavior change in community settings; autism intervention; widespread dissemination of evidence-based interventions in school and community settings.

Kareem Edouard, PhD *(Stanford University)*. Assistant Professor. Educational technology; internet-based STEM learning; equity and inclusion in STEM education

Salvatore V. Falletta, EdD *(North Carolina State University)*. Clinical Professor. Human Resource intelligence (i.e., HR research and analytics practices); HRD assessment, measurement, and evaluation models and taxonomies; organizational diagnostic models; web-based employee and organizational survey methods, and computational modeling.

Alonzo M. Flowers, III, PhD *(Texas A&M University)*. Associate Professor. Education issues including academic identity development of men of color in STEM education, diversity in teaching & learning, research methods/ design, and college student development in higher education

Aroutis N. Foster, PhD *(Michigan State University)*. Associate Professor. Educational psychology and educational technology, especially the following: Motivation; Technological Pedagogical Content Knowledge (TPACK); Immersive Interactive Digital Environments (simulation, games, virtual realities.

Kathy Geller, PhD *(Fielding Graduate University)*. Associate Clinical Professor. Educational leadership and management.

Rajashi Ghosh, PhD *(University of Louisville, Kentucky) Department Chair for Policy, Organization & Leadership*. Associate Professor. Mentoring and leader development, workplace Incivility, workplace learning and development.

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Paul Harrington, PhD *(University of Massachusetts, Boston) Director, Center for Labor Markets and Policy*. Professor. Teen and young adult job access; economic outlook, college labor market; workforce development, planning, and development; vocational rehabilitation and job market transition.

Michael J. Haslip, PhD *(Old Dominion University)*. Assistant Professor. Early childhood education, social and emotional learning, child guidance strategies, effects of public pre-school attendance.

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Jennifer Katz-Buonincontro, PhD *(University of Oregon) Associate Dean of Research*. Associate Professor. Educational administration, leadership development, survey & instrument design.

Larry Keiser, PhD *(Drexel University)*. Associate Clinical Professor. Education and corporate/business leaders' creativity and entrepreneurial mindsets; creative school/work environments; neuroscience of creativity; everyday creativity for teachers and educators.

Kristine Kelly, PhD *(University of Wisconsin, Madison)*. Associate Clinical Professor. Sociology of gender and development; anthropology of policy; comparative and international education; qualitative research methods; Vietnam and Southeast Asia.

Cameron Kiosoglous, PhD *(Virginia Tech University) Program Director*. Assistant Clinical Professor. Coached on the USRowing National Team staff since 2002, including the 2004, 2008, 2012, and 2016 Olympic Games; coaching development; measuring coaching quality; self-insight and reflective practices; coaching leadership; conference presenter; published author.

Valerie Klein, PhD *(Amherst College)*. Associate Clinical Professor. Mathematics learning and teaching; teacher's use of formative assessment in mathematics; creating opportunities for rich problem solving in the classroom; examining teachers growth and change; qualitative research methods.

Michael G. Kozak, Ed.D. *(Rowan University)*. Assistant Clinical Professor. Leadership, STEAM, online and blended learning environments, systems thinking, experiential learning, K-12 education, and facilitating change

Amanda Lannie, PhD *(Syracuse University)*. Assistant Clinical Professor. Applied behavior analysis and special education; School-based consultation; system-wide interventions as a mechanism for delivery

supports to all students; Designing effective and efficient interventions for students with emotional/behavioral disorders.

Vera Lee, EdD *(University of Pennsylvania)*. Assistant Clinical Professor. Practitioner Research in online courses to explore inservice/preservice teachers' emerging understandings about issues of diversity; the development of information/digital literacies of urban youth; English language learners.

Bruce Levine, JD *(New York University)*. Associate Clinical Professor. Educational policy, school law, public-private partnerships, intersection of business and education.

Kristine Lewis-Grant, PhD *(Temple University)*. Clinical Professor. Experiences of students of African descent at predominantly white colleges and universities, college access and college student development, youth civic engagement in urban school reform, qualitative research and evaluation.

William Lynch, PhD *(University of Maryland)*. Professor. Curriculum and educational leadership, educational technology, distance learning policy development, higher and adult education.

Constance Lyttle, PhD, JD *(University of Pittsburgh, Duquesne University)*. Clinical Professor. Legal rights of gifted and talented children and children with disabilities; inclusive education of exceptional children; special education mediation; special education IEP/IFSP facilitation; resolution session facilitation

Joy Phillips, PhD *(The University of Texas at Austin)*. Associate Clinical Professor. Visionary leadership in theory and practice, school reform as innovative problem-setting, thinking qualitatively about school reform. thinking about school reform by drawing, Educational Leadership Program Assessment.

Joyce Pittman, PhD *(Iowa State University of Science and Technology)*. Clinical Professor. Curriculum and instruction K-16; teaching English as a foreign language (TEFL); instructional design business education and administration; industrial and career technology; oral and written communication; research methodology; instructional and assistive technology assessment; online learning pedagogy

Kathleen Provinzano, PhD *(Marywood University)*. Assistant Professor. Educational administration.

Lori Severino, EdD *(Neumann University)*. Assistant Professor. Special education, differentiated instruction, reading, Wilson language, multi-sensory instruction, reading comprehension, assessment, adolescent literacy.

Jason Silverman, PhD *(Vanderbilt University)*. Professor. Teaching and learning of advanced mathematical ideas (algebra and calculus); improving teachers' ability to orchestrate and sustain inquiry-based and discussion-based instruction; technology in mathematics education.

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Christopher G. Wright, PhD *(Tufts University)*. Assistant Professor. Engineering and science education, Urban education, elementary teacher education.

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Fredricka K. Reisman, PhD *(Syracuse University) Director of the Torrance Center for Creativity and Innovation*. Professor Emeritus. Mathematics education, learning mathematics, mathematics pedagogy, teacher education, heuristic diagnostic learning and teaching, theory and research in creativity and applied creativity.

Elementary Education: PK-4

Major: Elementary Education
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: One Co-op (Four years)
Classification of Instructional (CIP) code: 13.1202
Standard Occupational Classification (SOC) code: 25-2031

About the Concentration

This certification option within the BS in Elementary Education (p. 432) enables teachers to work with children in pre-kindergarten, kindergarten, and grades 1 through 4 (ages 3-9) across subject areas. Required competencies are covered in areas such as child development, language development, early literacy and math foundations for preschool years, early intervention, integrating the arts for the developing child, and family and community partnerships.

Additional Information

For more information about the program, visit the School of Education (http://drexel.edu/soe/) website.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education/Content Requirements

BIO 100	Applied Cells, Genetics & Physiology	3.0
BIO 101	Applied Biological Diversity, Ecology & Evolution	3.0
CHEM 111	General Chemistry I	4.0
CIVC 101	Introduction to Civic Engagement *	1.0
COM 111	Principles of Communication	3.0
COOP 101	Career Management and Professional Development	0.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
ENVS 260	Environmental Science and Society	3.0
HIST 275	History of Pennsylvania	3.0
MATH 171	Introduction to Analysis A	3.0
MATH 172	Introduction to Analysis B	3.0
MATH 173	Introduction to Analysis C	3.0
or MATH 107	Probability and Statistics for Liberal Arts	
MUSC 130	Introduction to Music	3.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
PHYS 151	Applied Physics	3.0
PSY 101	General Psychology I	3.0
PSY 320 [WI]	Educational Psychology	3.0
PSY 330	Cognitive Psychology	3.0
SOC 335	Sociology of Education	3.0
UNIV T101	The Drexel Experience *	1.0
English (Literature) elective: Select course between ENGL 200 - ENGL 360		3.0
Free electives		14.0
Pedagogy Requirements		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDEX 346	Literacy and Content Skill Development PreK-8	3.0
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar **	3.0
EDUC 120	Child Development I: Typical Development	3.0
EDUC 121	Child Development II: Atypical Development	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 210	Early Language Development	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 236	Early Literacy I	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 306	Assessment of Young Children	3.0
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 314	Science Teaching Methods	3.0

EDUC 316	Teaching in Urban Contexts	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 326 [WI]	Language Arts Processes	3.0
EDUC 335	Engaging the Learner	3.0
EDUC 336	Early Literacy II	3.0
EDUC 338	Expressive Arts for PK-4	3.0
EDUC 355	Social Studies Teaching Methods	3.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
EDUC 411	Family and Community Partnerships	3.0
MTED 417	Mathematics Methods and Content: Early Childhood	3.0
MTED 418	Mathematics Methods and Content	3.0
Student Teaching Experience		
EDUC 409	Student Teaching Seminar I	9.0
EDUC 410 [WI]	Student Teaching	9.0
Total Credits		180.0

*   UNIV T101 and CIVC 101 are not required for Education transfer students, instead these 2 credits are replaced with free electives.

**   This 1.0 course will taken three times for a total of 3.0 credits.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Elementary PK-4 Concentration: Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

4 YR UG Co-op Concentration

Term 1		Credits
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 120	Child Development I: Typical Development	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 171	Introduction to Analysis A	3.0

UNIV T101 [*]	The Drexel Experience	1.0
	Term Credits	14.0
Term 2		
BIO 100 or 161	Applied Cells, Genetics & Physiology General Biology I	3.0
CIVC 101 [*]	Introduction to Civic Engagement	1.0
COM 111	Principles of Communication	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 121	Child Development II: Atypical Development	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 172	Introduction to Analysis B	3.0
	Term Credits	17.0
Term 3		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 173 or 107	Introduction to Analysis C Probability and Statistics for Liberal Arts	3.0
MUSC 130	Introduction to Music	3.0
PSY 101	General Psychology I	3.0
	Term Credits	16.0
Term 4		
CHEM 111	General Chemistry I	4.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 308	Creating a Positive Classroom Climate	3.0
PSY 330	Cognitive Psychology	3.0
Free Elective		2.0
	Term Credits	16.0
Term 5		
BIO 101 or 161	Applied Biological Diversity, Ecology & Evolution General Biology I	3.0
COOP 101	Career Management and Professional Development	0.0
EDEX 346	Literacy and Content Skill Development PreK-8	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 314	Science Teaching Methods	3.0
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 335	Engaging the Learner	3.0
	Term Credits	18.0
Term 6		
EDUC 236	Early Literacy I	3.0
EDUC 326 [WI]	Language Arts Processes	3.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
PSY 320 [WI]	Educational Psychology	3.0
	Term Credits	15.0
Term 7		
EDUC 210	Early Language Development	3.0
EDUC 306	Assessment of Young Children	3.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
HIST 275	History of Pennsylvania	3.0
	Term Credits	15.0
Term 8		
MTED 417	Mathematics Methods and Content: Early Childhood	3.0
COOP		
	Term Credits	3.0
Term 9		

EDUC 336	Early Literacy II	3.0
COOP		
	Term Credits	3.0
Term 10		
ECON 201	Principles of Microeconomics	4.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 411	Family and Community Partnerships	3.0
PHYS 151	Applied Physics	3.0
English (Literature) Elective: ENGL 200 - ENGL 360		3.0
	Term Credits	14.0
Term 11		
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 338	Expressive Arts for PK-4	3.0
EDUC 355	Social Studies Teaching Methods	3.0
MTED 418	Mathematics Methods and Content	3.0
Free Elective		3.0
	Term Credits	15.0
Term 12		
EDUC 405	Senior Pedagogy Seminar	1.0
EDUC 409	Student Teaching Seminar I	9.0
	Term Credits	10.0
Term 13		
EDUC 410 [WI]	Student Teaching	9.0
SOC 335	Sociology of Education	3.0
	Term Credits	12.0
Term 14		
ENVS 260	Environmental Science and Society	3.0
Free Electives		9.0
	Term Credits	12.0

Total Credit: 180.0

*   UNIV T101 and CIVC 101 are not required for Education transfer students. These 2 credits are replaced with free electives.

Education Faculty

Jennifer Adams, EdD *(Harvard University)*. Associate Professor. Comparative and international education; Poverty and education; Child welfare; Educational policy.

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in community settings; autism intervention; widespread dissemination of evidence-based interventions in school and community settings.

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equity, high school dropout, parent involvement/family involvement, community engagement in research.

Jennifer Katz-Buonincontro, PhD *(University of Oregon) Associate Dean of Research*. Associate Professor. Educational administration, leadership development, survey & instrument design.

Larry Keiser, PhD *(Drexel University)*. Associate Clinical Professor. Education and corporate/business leaders' creativity and entrepreneurial mindsets; creative school/work environments; neuroscience of creativity; everyday creativity for teachers and educators.

Kristine Kelly, PhD *(University of Wisconsin, Madison)*. Associate Clinical Professor. Sociology of gender and development; anthropology of policy; comparative and international education; qualitative research methods; Vietnam and Southeast Asia.

Cameron Kiosoglous, PhD *(Virginia Tech University) Program Director*. Assistant Clinical Professor. Coached on the USRowing National Team staff since 2002, including the 2004, 2008, 2012, and 2016 Olympic Games; coaching development; measuring coaching quality; self-insight and reflective practices; coaching leadership; conference presenter; published author.

Valerie Klein, PhD *(Amherst College)*. Associate Clinical Professor. Mathematics learning and teaching; teacher's use of formative assessment in mathematics; creating opportunities for rich problem solving in the classroom; examining teachers growth and change; qualitative research methods.

Michael G. Kozak, Ed.D. *(Rowan University)*. Assistant Clinical Professor. Leadership, STEAM, online and blended learning environments, systems thinking, experiential learning, K-12 education, and facilitating change

Amanda Lannie, PhD *(Syracuse University)*. Assistant Clinical Professor. Applied behavior analysis and special education; School-based consultation; system-wide interventions as a mechanism for delivery supports to all students; Designing effective and efficient interventions for students with emotional/behavioral disorders.

Vera Lee, EdD *(University of Pennsylvania)*. Assistant Clinical Professor. Practitioner Research in online courses to explore inservice/preservice teachers' emerging understandings about issues of diversity; the development of information/digital literacies of urban youth; English language learners.

Bruce Levine, JD *(New York University)*. Associate Clinical Professor. Educational policy, school law, public-private partnerships, intersection of business and education.

Kristine Lewis-Grant, PhD *(Temple University)*. Clinical Professor. Experiences of students of African descent at predominantly white colleges and universities, college access and college student development, youth civic engagement in urban school reform, qualitative research and evaluation.

William Lynch, PhD *(University of Maryland)*. Professor. Curriculum and educational leadership, educational technology, distance learning policy development, higher and adult education.

Constance Lyttle, PhD, JD *(University of Pittsburgh, Duquesne University)*. Clinical Professor. Legal rights of gifted and talented children and children with disabilities; inclusive education of exceptional children;

special education mediation; special education IEP/IFSP facilitation; resolution session facilitation

Joy Phillips, PhD *(The University of Texas at Austin)*. Associate Clinical Professor. Visionary leadership in theory and practice, school reform as innovative problem-setting, thinking qualitatively about school reform. thinking about school reform by drawing, Educational Leadership Program Assessment.

Joyce Pittman, PhD *(Iowa State University of Science and Technology)*. Clinical Professor. Curriculum and instruction K-16; teaching English as a foreign language (TEFL); instructional design business education and administration; industrial and career technology; oral and written communication; research methodology; instructional and assistive technology assessment; online learning pedagogy

Kathleen Provinzano, PhD *(Marywood University)*. Assistant Professor. Educational administration.

Lori Severino, EdD *(Neumann University)*. Assistant Professor. Special education, differentiated instruction, reading, Wilson language, multi-sensory instruction, reading comprehension, assessment, adolescent literacy.

Jason Silverman, PhD *(Vanderbilt University)*. Professor. Teaching and learning of advanced mathematical ideas (algebra and calculus); improving teachers' ability to orchestrate and sustain inquiry-based and discussion-based instruction; technology in mathematics education.

Joanne Sloand, EdD *(Duquesne University) Department Chair for Teaching, Learning & Curriculum.* Associate Clinical Professor. Special Education Leadership, Trauma-informed care, Parent engagement in special education service delivery.

Brian Smith, PhD *(Northwestern University) Senior Associate Dean of Academic Affairs.* Professor. Design of computer-based learning environments, computer science education, human-computer interaction, creativity and innovation; design sciences; informal/everyday learning.

Toni A. Sondergeld, PhD *(University of Toledo)*. Associate Professor. Cognitive and affective assessment development; program/grant evaluation; high stakes testing measurement; STEM education; urban education

Nancy Butler Songer, PhD *(University of California, Davis)*. Distinguished Professor. STEM education, urban education, educational assistance

Bridget Sweeney Blakely, PhD *(Temple University)*. Assistant Clinical Professor. Consultation; Positive Behavior Interventions and Supports (PBIS); Response to Intervention (RtI); Systems-level change; performance feedback

Mary Jean Tecce DeCarlo, EdD *(University of Pennsylvania)*. Associate Clinical Professor. Early literacy development, learning differences, knowledge construction, urban education.

Sarah P. Ulrich, EdD *(Saint Joseph's University) Associate Dean of Teacher Education and Undergraduate Affairs.* Clinical Professor. Cross-cultural, language and academic development, school reform, teacher preparation, teacher retention, teacher residencies in urban contexts.

Sheila Vaidya, PhD *(Temple University)*. Professor. Educational psychology, school psychology, research design.

Christina Vorndran, PhD *(Louisiana State University) Program Director, Applied Behavior Analysis and Special Education.* Clinical Professor.

Designing effective and efficient community-based interventions, Severe behavior disorders, Functional behavior assessment

Christopher G. Wright, PhD *(Tufts University)*. Assistant Professor. Engineering and science education, Urban education, elementary teacher education.

Emeritus Faculty

Mary Jo Grdina, PhD *(Case Western Reserve University)*. Clinical Professor. Undergraduate studies, science education, curriculum design.

Fredricka K. Reisman, PhD *(Syracuse University) Director of the Torrance Center for Creativity and Innovation.* Professor Emeritus. Mathematics education, learning mathematics, mathematics pedagogy, teacher education, heuristic diagnostic learning and teaching, theory and research in creativity and applied creativity.

Elementary Education: PK-4 and Special Education

Major: Elementary Education
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 184.0
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 13.1202
Standard Occupational Classification (SOC) code: 25-2022

About the Concentration

This certification option within the BS in Elementary Education (p. 432) enables teachers to work with children in pre-kindergarten, kindergarten, and grades 1 through 4 (ages 3-9) across subject areas, with the addition of being specialized to work with students at risk for disabilities or with disabilities. As with the Elementary PK-4 certification, the program covers required competencies such as child development, language development, early literacy and math foundations for preschool years, early intervention, integration of the arts for the developing child, and family and community partnerships.

Improvements in the diagnosis of learning disabilities at earlier ages have resulted in an increase in the number of students requiring special education. This program is designed to provide the information necessary to: understand the complexities of the disabled learner's needs; modify a curriculum appropriately; provide remedial instruction; use technology to address the learner's needs/progress; manage instruction for students with special needs in the inclusive classroom; as well as additional approaches to assessment and special education teaching techniques.

Additional Information

For more information about the program, visit the School of Education (http://drexel.edu/soe/) website.

The Pennsylvania Department of Education (PDE) is currently in the process of restructuring its requirements for Special Education Certification, grades PK-8 and grades 7-12. While the requirements are mandated by the PDE, the School of Education is committed to working with both current and new candidates to fulfill the competencies as required. For additional information, please contact the School of Education's undergraduate Academic Advising Department at 215-895-6770.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education/Content Requirements

BIO 100	Applied Cells, Genetics & Physiology	3.0
or BIO 161	General Biology I	
BIO 101	Applied Biological Diversity, Ecology & Evolution	3.0
or BIO 162	General Biology II	
CHEM 111	General Chemistry I	4.0
CIVC 101	Introduction to Civic Engagement [*]	1.0
COM 111	Principles of Communication	3.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
English (Literature) elective: Select course between ENGL 200 - ENGL 360		3.0
ENVS 260	Environmental Science and Society	3.0
HIST 275	History of Pennsylvania	3.0
MATH 171	Introduction to Analysis A	3.0
MATH 172	Introduction to Analysis B	3.0
MATH 173	Introduction to Analysis C	3.0
or MATH 107	Probability and Statistics for Liberal Arts	
MUSC 130	Introduction to Music	3.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
PHYS 151	Applied Physics	3.0
PSY 101	General Psychology I	3.0
PSY 320 [WI]	Educational Psychology	3.0
PSY 330	Cognitive Psychology	3.0
SOC 335	Sociology of Education	3.0
UNIV T101	The Drexel Experience [*]	1.0

Pedagogy Requirements

EDLT 325	Design for Learning with Digital Media	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	3.0
EDUC 120	Child Development I: Typical Development	3.0
EDUC 121	Child Development II: Atypical Development	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 236	Early Literacy I	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 306	Assessment of Young Children	3.0
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 314	Science Teaching Methods	3.0
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 326 [WI]	Language Arts Processes	3.0
EDUC 335	Engaging the Learner	3.0
EDUC 336	Early Literacy II	3.0
EDUC 338	Expressive Arts for PK-4	3.0
EDUC 355	Social Studies Teaching Methods	3.0
EDUC 365	Foundations in Instructing English Language Learners	3.0

EDUC 405	Senior Pedagogy Seminar	1.0
EDUC 411	Family and Community Partnerships	3.0
MTED 417	Mathematics Methods and Content: Early Childhood	3.0
MTED 418	Mathematics Methods and Content	3.0
Special Education Core Courses		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDEX 346	Literacy and Content Skill Development PreK-8	3.0
EDEX 347	Special Education Processes PreK-8	3.0
EDEX 348	Emotional and Behavioral Support of Individuals with Disabilities	3.0
EDEX 349	High Incident Disabilities	3.0
EDEX 350	Teaching Individuals with Low Incident Disabilities	3.0
EDEX 351	Pervasive Developmental Disorders	3.0
EDEX 352	Integrating Technology for Learning & Achievement	3.0
EDEX 353	Special Education: Methods & Practices PreK-8	3.0
Student Teaching Experience		
EDUC 409	Student Teaching Seminar I	9.0
EDEX 414 [WI]	Special Education Student Teaching Seminar	9.0
Total Credits		184.0

[*] UNIV T101 and CIVC 101 are not required for Education transfer students; instead these 2 credits are replaced with free electives.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Elementary PK-4 and Special Education Concentration: Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

4 YR UG Co-op

Term 1		Credits
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 120	Child Development I: Typical Development	3.0

ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 171	Introduction to Analysis A	3.0
UNIV T101	The Drexel Experience	1.0
	Term Credits	14.0
Term 2		
BIO 100 or 161	Applied Cells, Genetics & Physiology General Biology I	3.0
CIVC 101	Introduction to Civic Engagement	1.0
COM 111	Principles of Communication	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 121	Child Development II: Atypical Development	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 172	Introduction to Analysis B	3.0
	Term Credits	17.0
Term 3		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 173 or 107	Introduction to Analysis C Probability and Statistics for Liberal Arts	3.0
MUSC 130	Introduction to Music	3.0
PSY 101	General Psychology I	3.0
	Term Credits	16.0
Term 4		
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDEX 349	High Incident Disabilities	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 308	Creating a Positive Classroom Climate	3.0
ENGL 200 through ENGL 360		3.0
	Term Credits	13.0
Term 5		
BIO 101 or 162	Applied Biological Diversity, Ecology & Evolution General Biology II	3.0
EDEX 346	Literacy and Content Skill Development PreK-8	3.0
EDEX 348	Emotional and Behavioral Support of Individuals with Disabilities	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 314	Science Teaching Methods	3.0
EDUC 316	Teaching in Urban Contexts	3.0
COOP 101	Career Management and Professional Development	0.0
	Term Credits	18.0
Term 6		
EDUC 236	Early Literacy I	3.0
EDUC 326 [WI]	Language Arts Processes	3.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
PSY 320 [WI]	Educational Psychology	3.0
	Term Credits	15.0
Term 7		
EDEX 350	Teaching Individuals with Low Incident Disabilities	3.0
EDUC 306	Assessment of Young Children	3.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
HIST 275	History of Pennsylvania	3.0
	Term Credits	15.0
Term 8		
COOP (16 COOP CREDITS)		
MTED 417	Mathematics Methods and Content: Early Childhood	3.0
	Term Credits	3.0

Term 9		
COOP (16 COOP CREDITS)		
EDUC 336	Early Literacy II	3.0
	Term Credits	3.0
Term 10		
EDEX 353	Special Education: Methods & Practices PreK-8	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 411	Family and Community Partnerships	3.0
PHYS 151	Applied Physics	3.0
PSY 330	Cognitive Psychology	3.0
	Term Credits	13.0
Term 11		
EDUC 335	Engaging the Learner	3.0
EDUC 338	Expressive Arts for PK-4	3.0
EDUC 355	Social Studies Teaching Methods	3.0
ENVS 260	Environmental Science and Society	3.0
MTED 418	Mathematics Methods and Content	3.0
	Term Credits	15.0
Term 12		
EDEX 347	Special Education Processes PreK-8	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
EDUC 409	Student Teaching Seminar I	9.0
	Term Credits	13.0
Term 13		
EDEX 351	Pervasive Developmental Disorders	3.0
EDEX 414 [WI]	Special Education Student Teaching Seminar	9.0
SOC 335	Sociology of Education	3.0
	Term Credits	15.0
Term 14		
CHEM 111	General Chemistry I	4.0
ECON 201	Principles of Microeconomics	4.0
EDEX 352	Integrating Technology for Learning & Achievement	3.0
EDLT 325	Design for Learning with Digital Media	3.0
	Term Credits	14.0

Total Credit: 184.0

Education Faculty

Jennifer Adams, EdD *(Harvard University)*. Associate Professor. Comparative and international education; Poverty and education; Child welfare; Educational policy.

Ayana Allen, PhD *(Texas A&M University)*. Assistant Professor. Urban education; Identity construction in school contexts; Urban school transformation.

Kristen Betts, EdD *(George Washington University)*. Clinical Professor. Higher education administration and governance, online blended education, instructional design and educational technology, program assessment and evaluation.

Eric Brewe, PhD *(Arizona State University)*. Associate Professor. Physics Education Research, introductory course reform, network analysis in learning, neuromechanisms of learning.

José Luis Chávez, EdD *(University of Southern California)*. Clinical Professor. Higher education leadership and administration.

Rebecca Clothey, PhD *(University of Pittsburgh)*. Associate Professor. Comparative and international education, education of ethnic and linguistic minorities, sociology of education.

James Connell, PhD *(Louisiana State University) Founding Clinical Core Director and Research Fellow, A.J. Drexel Autism Institute*. Associate Professor. Identifying the variables that influence adult behavior change in community settings; autism intervention; widespread dissemination of evidence-based interventions in school and community settings.

Kareem Edouard, PhD *(Stanford University)*. Assistant Professor. Educational technology; internet-based STEM learning; equity and inclusion in STEM education

Salvatore V. Falletta, EdD *(North Carolina State University)*. Clinical Professor. Human Resource intelligence (i.e., HR research and analytics practices); HRD assessment, measurement, and evaluation models and taxonomies; organizational diagnostic models; web-based employee and organizational survey methods, and computational modeling.

Alonzo M. Flowers, III, PhD *(Texas A&M University)*. Associate Professor. Education issues including academic identity development of men of color in STEM education, diversity in teaching & learning, research methods/design, and college student development in higher education

Aroutis N. Foster, PhD *(Michigan State University)*. Associate Professor. Educational psychology and educational technology, especially the following: Motivation; Technological Pedagogical Content Knowledge (TPACK); Immersive Interactive Digital Environments (simulation, games, virtual realities.

Kathy Geller, PhD *(Fielding Graduate University)*. Associate Clinical Professor. Educational leadership and management.

Rajashi Ghosh, PhD *(University of Louisville, Kentucky) Department Chair for Policy, Organization & Leadership*. Associate Professor. Mentoring and leader development, workplace Incivility, workplace learning and development.

John M. Gould, PhD *(University of Pittsburgh) Harrisburg EdD Educational Leadership & Change Program*. Clinical Professor. Change leadership, curriculum re-design, the impact of technology on learning.

Dominic F. Gullo, PhD *(Indiana University)*. Professor. Studying the relative and long-range effects of early schooling experiences in prekindergarten and kindergarten on children's achievement and social adaptation to school routine.

H. Bernard Hall, PhD *(Temple University)*. Assistant Professor. Hip-hop Pedagogy , English Education, Urban Teacher Education.

Penny Hammrich, PhD *(University of Minnesota) Dean*. Distinguished University Professor. Urban education; science education; genetics; gender equity; science knowledge for conceptual teaching; sport science.

Paul Harrington, PhD *(University of Massachusetts, Boston) Director, Center for Labor Markets and Policy*. Professor. Teen and young adult job access; economic outlook, college labor market; workforce development, planning, and development; vocational rehabilitation and job market transition.

Michael J. Haslip, PhD *(Old Dominion University)*. Assistant Professor. Early childhood education, social and emotional learning, child guidance strategies, effects of public pre-school attendance.

Deanna Hill, JD, PhD *(University of Pittsburgh)*. Associate Clinical Professor. Higher education, international education, education law, education policy

Erin Horvat, PhD *(University of California, Los Angeles) Senior Vice Provost for Faculty Affairs*. Professor. Urban education, access and equity, high school dropout, parent involvement/family involvement, community engagement in research.

Jennifer Katz-Buonincontro, PhD *(University of Oregon) Associate Dean of Research*. Associate Professor. Educational administration, leadership development, survey & instrument design.

Larry Keiser, PhD *(Drexel University)*. Associate Clinical Professor. Education and corporate/business leaders' creativity and entrepreneurial mindsets; creative school/work environments; neuroscience of creativity; everyday creativity for teachers and educators.

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William Lynch, PhD *(University of Maryland)*. Professor. Curriculum and educational leadership, educational technology, distance learning policy development, higher and adult education.

Constance Lyttle, PhD, JD *(University of Pittsburgh, Duquesne University)*. Clinical Professor. Legal rights of gifted and talented children and children with disabilities; inclusive education of exceptional children;

special education mediation; special education IEP/IFSP facilitation; resolution session facilitation

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Joyce Pittman, PhD *(Iowa State University of Science and Technology)*. Clinical Professor. Curriculum and instruction K-16; teaching English as a foreign language (TEFL); instructional design business education and administration; industrial and career technology; oral and written communication; research methodology; instructional and assistive technology assessment; online learning pedagogy

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Lori Severino, EdD *(Neumann University)*. Assistant Professor. Special education, differentiated instruction, reading, Wilson language, multi-sensory instruction, reading comprehension, assessment, adolescent literacy.

Jason Silverman, PhD *(Vanderbilt University)*. Professor. Teaching and learning of advanced mathematical ideas (algebra and calculus); improving teachers' ability to orchestrate and sustain inquiry-based and discussion-based instruction; technology in mathematics education.

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Brian Smith, PhD *(Northwestern University) Senior Associate Dean of Academic Affairs.* Professor. Design of computer-based learning environments, computer science education, human-computer interaction, creativity and innovation; design sciences; informal/everyday learning.

Toni A. Sondergeld, PhD *(University of Toledo)*. Associate Professor. Cognitive and affective assessment development; program/grant evaluation; high stakes testing measurement; STEM education; urban education

Nancy Butler Songer, PhD *(University of California, Davis)*. Distinguished Professor. STEM education, urban education, educational assistance

Bridget Sweeney Blakely, PhD *(Temple University)*. Assistant Clinical Professor. Consultation; Positive Behavior Interventions and Supports (PBIS); Response to Intervention (Rtl); Systems-level change; performance feedback

Mary Jean Tecce DeCarlo, EdD *(University of Pennsylvania)*. Associate Clinical Professor. Early literacy development, learning differences, knowledge construction, urban education.

Sarah P. Ulrich, EdD *(Saint Joseph's University) Associate Dean of Teacher Education and Undergraduate Affairs.* Clinical Professor. Cross-cultural, language and academic development, school reform, teacher preparation, teacher retention, teacher residencies in urban contexts.

Sheila Vaidya, PhD *(Temple University)*. Professor. Educational psychology, school psychology, research design.

Christina Vorndran, PhD *(Louisiana State University) Program Director, Applied Behavior Analysis and Special Education.* Clinical Professor.

Designing effective and efficient community-based interventions, Severe behavior disorders, Functional behavior assessment

Christopher G. Wright, PhD *(Tufts University)*. Assistant Professor. Engineering and science education, Urban education, elementary teacher education.

Emeritus Faculty

Mary Jo Grdina, PhD *(Case Western Reserve University)*. Clinical Professor. Undergraduate studies, science education, curriculum design.

Fredricka K. Reisman, PhD *(Syracuse University) Director of the Torrance Center for Creativity and Innovation.* Professor Emeritus. Mathematics education, learning mathematics, mathematics pedagogy, teacher education, heuristic diagnostic learning and teaching, theory and research in creativity and applied creativity.

Elementary Education: Middle Level Math and English

Major: Elementary Education
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: One Co-op (Four years)
Classification of Instructional (CIP) code: 13.1202
Standard Occupational Classification (SOC) code: 25-2022

About the Concentration

This certification option within the BS in Elementary Education (p. 432) enables to teachers to work with students in grades 4-6 across subjects, and with students in grades 7-8 in the core academic subjects of mathematics and English.

This program addresses the complexities of adolescent development, through discussion of theories. It explores the middle school environment, developmentally appropriate middle school programs, strategies for supporting students through the transition to middle school, and the impact of peer pressure on the middle school child.

In addition, this certification area provides: (1) training in how to effectively deliver standards-based academic math content, based on age-appropriate understanding, individual and groups needs; (2) courses devoted to teaching;age-appropriate; reading skills, how to teach and assess writing effectively, as well as a specialized course in the genre of young adult fiction.

The Pennsylvania Department of Education (PDE) is currently in the process of restructuring its requirements for Special Education Certification, grades PK-8 and grades 7-12. While the requirements are mandated by the PDE, the School of Education is committed to working with both current and new students to fulfill the competencies as required. For additional information, please contact the School of Education's undergraduate Academic Advising Department at 215-895-6770.

Additional Information

For more information about the program, visit the School of Education (http://drexel.edu/soe/) website.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education/Content Requirements

ARTH 101	History of Art I: Ancient to Medieval	3.0
BIO 161	General Biology I	3.0
BIO 162	General Biology II	3.0
CHEM 111	General Chemistry I	4.0
CIVC 101	Introduction to Civic Engagement	1.0
COM 111	Principles of Communication	3.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
ENGL 304	Young Adult Fiction	3.0
ENVS 260	Environmental Science and Society	3.0
Select one of the following		4.0
HIST 201	United States History to 1815	
or HIST 202	United States History, 1815-1900	
or HIST 203	United States History since 1900	
HIST 275	History of Pennsylvania	3.0
LING 101	Introduction to Linguistics	3.0
MATH 171	Introduction to Analysis A	3.0
MATH 172	Introduction to Analysis B	3.0
MATH 173	Introduction to Analysis C	3.0
or MATH 107	Probability and Statistics for Liberal Arts	
MUSC 130	Introduction to Music	3.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
PHYS 151	Applied Physics	3.0
PSY 101	General Psychology I	3.0
PSY 320 [WI]	Educational Psychology	3.0
PSY 330	Cognitive Psychology	3.0
SOC 335	Sociology of Education	3.0
UNIV T101	The Drexel Experience	1.0
Free electives		10.0

Pedagogy Requirements

EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDEX 346	Literacy and Content Skill Development PreK-8	3.0
EDLT 325	Design for Learning with Digital Media	3.0
EDLT 326	Technology Applications for Learning	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	3.0
EDUC 115	Reasoning about Numbers and Quantity (4-8)	3.0
EDUC 123	Adolescent Development	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 223	Teaching the Middle School Child	3.0
EDUC 240	Proportional Reasoning in Middle School	3.0
EDUC 256	Teaching Writing Grades 4-8	3.0
EDUC 257	Content Area Reading (Grades 4-8)	3.0
EDUC 285	Teaching Physical Science in the Middle School	3.0

EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 306	Assessment of Young Children	3.0
EDUC 314	Science Teaching Methods	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 326 [WI]	Language Arts Processes	3.0
EDUC 328	Language Arts Processes 4-8	3.0
EDUC 355	Social Studies Teaching Methods	3.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
EDUC 416	Introduction to Math Teaching Methods (4-8)	3.0
EDUC 417	Advanced Math Teaching Methods (4-8)	3.0
EDUC 432	Algebraic Reasoning	3.0
EDUC 433	Functions in Middle School Math	3.0
MTED 418	Mathematics Methods and Content	3.0
Student Teaching Experience		
EDUC 410 [WI]	Student Teaching	9.0
Total Credits		180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Middle Level Math and English: Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

4 YR UG Co-op Concentration /Middle Level Math & English

Term 1		Credits
BIO 161	General Biology I	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 123	Adolescent Development	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 171	Introduction to Analysis A	3.0

UNIV T101	The Drexel Experience	1.0
	Term Credits	17.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
COM 111	Principles of Communication	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 115	Reasoning about Numbers and Quantity (4-8)	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 172	Introduction to Analysis B	3.0
	Term Credits	14.0
Term 3		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 314	Science Teaching Methods	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
LING 101	Introduction to Linguistics	3.0
MATH 173 or 107	Introduction to Analysis C Probability and Statistics for Liberal Arts	3.0
	Term Credits	16.0
Term 4		
BIO 162	General Biology II	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 223	Teaching the Middle School Child	3.0
EDUC 285	Teaching Physical Science in the Middle School	3.0
PSY 101	General Psychology I	3.0
	Term Credits	16.0
Term 5		
EDUC 240	Proportional Reasoning in Middle School	3.0
EDUC 328	Language Arts Processes 4-8	3.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
PHYS 151	Applied Physics	3.0
HIST 275	History of Pennsylvania	3.0
	Term Credits	15.0
Term 6		
ECON 201	Principles of Microeconomics	4.0
EDEX 346	Literacy and Content Skill Development PreK-8	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 257	Content Area Reading (Grades 4-8)	3.0
	Term Credits	13.0
Term 7		
CHEM 111	General Chemistry I	4.0
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
PSY 320 [WI]	Educational Psychology	3.0
SOC 335	Sociology of Education	3.0
	Term Credits	17.0
Term 8		
EDUC 256	Teaching Writing Grades 4-8	3.0
EDUC 306	Assessment of Young Children	3.0
EDUC 355	Social Studies Teaching Methods	3.0
ENVS 260	Environmental Science and Society	3.0
MTED 418	Mathematics Methods and Content	3.0
	Term Credits	15.0
Term 9		
EDLT 326	Technology Applications for Learning	3.0
EDUC 326 [WI]	Language Arts Processes	3.0
EDUC 416	Introduction to Math Teaching Methods (4-8)	3.0

EDUC 432	Algebraic Reasoning	3.0
Free electives		4.0
	Term Credits	16.0
Term 10		
EDUC 417	Advanced Math Teaching Methods (4-8)	3.0
EDUC 433	Functions in Middle School Math	3.0
MUSC 130	Introduction to Music	3.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
PSY 330	Cognitive Psychology	3.0
	Term Credits	15.0
Term 11		
EDUC 405	Senior Pedagogy Seminar	1.0
EDUC 410 [WI]	Student Teaching	9.0
Free Elective		3.0
	Term Credits	13.0
Term 12		
ARTH 101	History of Art I: Ancient to Medieval	3.0
ENGL 304	Young Adult Fiction	3.0
Select one of the following:		4.0
HIST 201	United States History to 1815	
HIST 202	United States History, 1815-1900	
HIST 203	United States History since 1900	
Free Elective		3.0
	Term Credits	13.0

Total Credit: 180.0

Education Faculty

Jennifer Adams, EdD *(Harvard University)*. Associate Professor. Comparative and international education; Poverty and education; Child welfare; Educational policy.

Ayana Allen, PhD *(Texas A&M University)*. Assistant Professor. Urban education; Identity construction in school contexts; Urban school transformation.

Kristen Betts, EdD *(George Washington University)*. Clinical Professor. Higher education administration and governance, online blended education, instructional design and educational technology, program assessment and evaluation.

Eric Brewe, PhD *(Arizona State University)*. Associate Professor. Physics Education Research, introductory course reform, network analysis in learning, neuromechanisms of learning.

José Luis Chávez, EdD *(University of Southern California)*. Clinical Professor. Higher education leadership and administration.

Rebecca Clothey, PhD *(University of Pittsburgh)*. Associate Professor. Comparative and international education, education of ethnic and linguistic minorities, sociology of education.

James Connell, PhD *(Louisiana State University) Founding Clinical Core Director and Research Fellow, A.J. Drexel Autism Institute*. Associate Professor. Identifying the variables that influence adult behavior change in community settings; autism intervention; widespread dissemination of evidence-based interventions in school and community settings.

Kareem Edouard, PhD *(Stanford University)*. Assistant Professor. Educational technology; internet-based STEM learning; equity and inclusion in STEM education

Salvatore V. Falletta, EdD *(North Carolina State University)*. Clinical Professor. Human Resource intelligence (i.e., HR research and analytics practices); HRD assessment, measurement, and evaluation models and taxonomies; organizational diagnostic models; web-based employee and organizational survey methods, and computational modeling.

Alonzo M. Flowers, III, PhD *(Texas A&M University)*. Associate Professor. Education issues including academic identity development of men of color in STEM education, diversity in teaching & learning, research methods/design, and college student development in higher education

Aroutis N. Foster, PhD *(Michigan State University)*. Associate Professor. Educational psychology and educational technology, especially the following: Motivation; Technological Pedagogical Content Knowledge (TPACK); Immersive Interactive Digital Environments (simulation, games, virtual realities.

Kathy Geller, PhD *(Fielding Graduate University)*. Associate Clinical Professor. Educational leadership and management.

Rajashi Ghosh, PhD *(University of Louisville, Kentucky) Department Chair for Policy, Organization & Leadership*. Associate Professor. Mentoring and leader development, workplace Incivility, workplace learning and development.

John M. Gould, PhD *(University of Pittsburgh) Harrisburg EdD Educational Leadership & Change Program*. Clinical Professor. Change leadership, curriculum re-design, the impact of technology on learning.

Dominic F. Gullo, PhD *(Indiana University)*. Professor. Studying the relative and long-range effects of early schooling experiences in prekindergarten and kindergarten on children's achievement and social adaptation to school routine.

H. Bernard Hall, PhD *(Temple University)*. Assistant Professor. Hip-hop Pedagogy , English Education, Urban Teacher Education.

Penny Hammrich, PhD *(University of Minnesota) Dean*. Distinguished University Professor. Urban education; science education; genetics; gender equity; science knowledge for conceptual teaching; sport science.

Paul Harrington, PhD *(University of Massachusetts, Boston) Director, Center for Labor Markets and Policy*. Professor. Teen and young adult job access; economic outlook, college labor market; workforce development, planning, and development; vocational rehabilitation and job market transition.

Michael J. Haslip, PhD *(Old Dominion University)*. Assistant Professor. Early childhood education, social and emotional learning, child guidance strategies, effects of public pre-school attendance.

Deanna Hill, JD, PhD *(University of Pittsburgh)*. Associate Clinical Professor. Higher education, international education, education law, education policy

Erin Horvat, PhD *(University of California, Los Angeles) Senior Vice Provost for Faculty Affairs*. Professor. Urban education, access and equity, high school dropout, parent involvement/family involvement, community engagement in research.

Jennifer Katz-Buonincontro, PhD *(University of Oregon) Associate Dean of Research*. Associate Professor. Educational administration, leadership development, survey & instrument design.

Larry Keiser, PhD *(Drexel University)*. Associate Clinical Professor. Education and corporate/business leaders' creativity and entrepreneurial

mindsets; creative school/work environments; neuroscience of creativity; everyday creativity for teachers and educators.

Kristine Kelly, PhD *(University of Wisconsin, Madison)*. Associate Clinical Professor. Sociology of gender and development; anthropology of policy; comparative and international education; qualitative research methods; Vietnam and Southeast Asia.

Cameron Kiosoglous, PhD *(Virginia Tech University) Program Director*. Assistant Clinical Professor. Coached on the USRowing National Team staff since 2002, including the 2004, 2008, 2012, and 2016 Olympic Games; coaching development; measuring coaching quality; self-insight and reflective practices; coaching leadership; conference presenter; published author.

Valerie Klein, PhD *(Amherst College)*. Associate Clinical Professor. Mathematics learning and teaching; teacher's use of formative assessment in mathematics; creating opportunities for rich problem solving in the classroom; examining teachers growth and change; qualitative research methods.

Michael G. Kozak, Ed.D. *(Rowan University)*. Assistant Clinical Professor. Leadership, STEAM, online and blended learning environments, systems thinking, experiential learning, K-12 education, and facilitating change

Amanda Lannie, PhD *(Syracuse University)*. Assistant Clinical Professor. Applied behavior analysis and special education; School-based consultation; system-wide interventions as a mechanism for delivery supports to all students; Designing effective and efficient interventions for students with emotional/behavioral disorders.

Vera Lee, EdD *(University of Pennsylvania)*. Assistant Clinical Professor. Practitioner Research in online courses to explore inservice/preservice teachers' emerging understandings about issues of diversity; the development of information/digital literacies of urban youth; English language learners.

Bruce Levine, JD *(New York University)*. Associate Clinical Professor. Educational policy, school law, public-private partnerships, intersection of business and education.

Kristine Lewis-Grant, PhD *(Temple University)*. Clinical Professor. Experiences of students of African descent at predominantly white colleges and universities, college access and college student development, youth civic engagement in urban school reform, qualitative research and evaluation.

William Lynch, PhD *(University of Maryland)*. Professor. Curriculum and educational leadership, educational technology, distance learning policy development, higher and adult education.

Constance Lyttle, PhD, JD *(University of Pittsburgh, Duquesne University)*. Clinical Professor. Legal rights of gifted and talented children and children with disabilities; inclusive education of exceptional children; special education mediation; special education IEP/IFSP facilitation; resolution session facilitation

Joy Phillips, PhD *(The University of Texas at Austin)*. Associate Clinical Professor. Visionary leadership in theory and practice, school reform as innovative problem-setting, thinking qualitatively about school reform. thinking about school reform by drawing, Educational Leadership Program Assessment.

Joyce Pittman, PhD *(Iowa State University of Science and Technology)*. Clinical Professor. Curriculum and instruction K-16; teaching English

as a foreign language (TEFL); instructional design business education and administration; industrial and career technology; oral and written communication; research methodology; instructional and assistive technology assessment; online learning pedagogy

Kathleen Provinzano, PhD *(Marywood University).* Assistant Professor. Educational administration.

Lori Severino, EdD *(Neumann University).* Assistant Professor. Special education, differentiated instruction, reading, Wilson language, multi-sensory instruction, reading comprehension, assessment, adolescent literacy.

Jason Silverman, PhD *(Vanderbilt University).* Professor. Teaching and learning of advanced mathematical ideas (algebra and calculus); improving teachers' ability to orchestrate and sustain inquiry-based and discussion-based instruction; technology in mathematics education.

Joanne Sloand, EdD *(Duquesne University) Department Chair for Teaching, Learning & Curriculum.* Associate Clinical Professor. Special Education Leadership, Trauma-informed care, Parent engagement in special education service delivery.

Brian Smith, PhD *(Northwestern University) Senior Associate Dean of Academic Affairs.* Professor. Design of computer-based learning environments, computer science education, human-computer interaction, creativity and innovation; design sciences; informal/everyday learning.

Toni A. Sondergeld, PhD *(University of Toledo).* Associate Professor. Cognitive and affective assessment development; program/grant evaluation; high stakes testing measurement; STEM education; urban education

Nancy Butler Songer, PhD *(University of California, Davis).* Distinguished Professor. STEM education, urban education, educational assistance

Bridget Sweeney Blakely, PhD *(Temple University).* Assistant Clinical Professor. Consultation; Positive Behavior Interventions and Supports (PBIS); Response to Intervention (Rtl); Systems-level change; performance feedback

Mary Jean Tecce DeCarlo, EdD *(University of Pennsylvania).* Associate Clinical Professor. Early literacy development, learning differences, knowledge construction, urban education.

Sarah P. Ulrich, EdD *(Saint Joseph's University) Associate Dean of Teacher Education and Undergraduate Affairs.* Clinical Professor. Cross-cultural, language and academic development, school reform, teacher preparation, teacher retention, teacher residencies in urban contexts.

Sheila Vaidya, PhD *(Temple University).* Professor. Educational psychology, school psychology, research design.

Christina Vorndran, PhD *(Louisiana State University) Program Director, Applied Behavior Analysis and Special Education.* Clinical Professor. Designing effective and efficient community-based interventions, Severe behavior disorders, Functional behavior assessment

Christopher G. Wright, PhD *(Tufts University).* Assistant Professor. Engineering and science education, Urban education, elementary teacher education.

Emeritus Faculty

Mary Jo Grdina, PhD *(Case Western Reserve University).* Clinical Professor. Undergraduate studies, science education, curriculum design.

Fredricka K. Reisman, PhD *(Syracuse University) Director of the Torrance Center for Creativity and Innovation.* Professor Emeritus. Mathematics education, learning mathematics, mathematics pedagogy, teacher education, heuristic diagnostic learning and teaching, theory and research in creativity and applied creativity.

Elementary Education: Middle Level Science and Math

Major: Elementary Education
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: One Co-op (Four years)
Classification of Instructional (CIP) code: 13.1202
Standard Occupational Classification (SOC) code: 25-2022

About the Concentration

This certification option within the BS in Elementary Education (p. 432) enables to teachers to work with students in grades 4-6 across subjects, and with students in grades 7-8 in the core academic subjects of science and mathematics.

This program addresses the complexities of adolescent development, through discussion of theories. It explores the middle school environment, developmentally appropriate middle school programs, strategies for supporting students through the transition to middle school, and the impact of peer pressure on the middle school child.

In addition, this certification area provides: (1) training in how to effectively deliver standards-based academic math content, based on age-appropriate understanding, individual and groups needs; (2) training and methodology for teaching physical and life sciences (including using an inquiry-based model of learning, developing authentic assessments, drawing upon a variety of tools, creating and maintaining a safe laboratory) as well as other skills necessary to meet the needs of diverse learners in science education.

The Pennsylvania Department of Education (PDE) is currently in the process of restructuring its requirements for Special Education Certification, grades PK-8 and grades 7-12. While the requirements are mandated by the PDE, the School of Education is committed to working with both current and new students to fulfill the competencies as required. For additional information, please contact the School of Education's undergraduate Academic Advising Department at 215-895-6770.

Additional Information

For more information about the program, visit the School of Education (http://drexel.edu/soe/) website.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education/Content Requirements

ARTH 101	History of Art I: Ancient to Medieval	3.0
BIO 161	General Biology I	3.0
BIO 162	General Biology II	3.0
CHEM 111	General Chemistry I	4.0
CIVC 101	Introduction to Civic Engagement	1.0
COM 111	Principles of Communication	3.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
ENVS 260	Environmental Science and Society	3.0
Select one of the following		4.0
HIST 201	United States History to 1815	
or HIST 202	United States History, 1815-1900	
or HIST 203	United States History since 1900	
HIST 275	History of Pennsylvania	3.0
MATH 171	Introduction to Analysis A	3.0
MATH 172	Introduction to Analysis B	3.0
MATH 173	Introduction to Analysis C	3.0
or MATH 107	Probability and Statistics for Liberal Arts	
MUSC 130	Introduction to Music	3.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
PHYS 151	Applied Physics	3.0
PSY 101	General Psychology I	3.0
PSY 320 [WI]	Educational Psychology	3.0
PSY 330	Cognitive Psychology	3.0
SOC 335	Sociology of Education	3.0
UNIV T101	The Drexel Experience	1.0
Free electives		16.0

Pedagogy Requirements

EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDEX 346	Literacy and Content Skill Development PreK-8	3.0
EDLT 325	Design for Learning with Digital Media	3.0
EDLT 326	Technology Applications for Learning	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	3.0
EDUC 115	Reasoning about Numbers and Quantity (4-8)	3.0
EDUC 123	Adolescent Development	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 223	Teaching the Middle School Child	3.0
EDUC 240	Proportional Reasoning in Middle School	3.0
EDUC 284	Teaching Life Science in the Middle School	3.0
EDUC 285	Teaching Physical Science in the Middle School	3.0
EDUC 286	Teaching Earth & Space Science for Middle School	3.0
EDUC 292	Science Methods for Middle School	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 306	Assessment of Young Children	3.0
EDUC 314	Science Teaching Methods	3.0
EDUC 315	Secondary Science Teaching Methods	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 355	Social Studies Teaching Methods	3.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
EDUC 405	Senior Pedagogy Seminar	1.0

EDUC 416	Introduction to Math Teaching Methods (4-8)	3.0
EDUC 417	Advanced Math Teaching Methods (4-8)	3.0
EDUC 432	Algebraic Reasoning	3.0
EDUC 433	Functions in Middle School Math	3.0
MTED 418	Mathematics Methods and Content	3.0
Student Teaching Experience		
EDUC 410 [WI]	Student Teaching	9.0
Total Credits		180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Middle Level Science and Math Concentration: Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

4 YR UG Co-op Concentration

Term 1		Credits
BIO 161	General Biology I	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 123	Adolescent Development	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 171	Introduction to Analysis A	3.0
UNIV T101	The Drexel Experience	1.0
	Term Credits	17.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
COM 111	Principles of Communication	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 172	Introduction to Analysis B	3.0
MUSC 130	Introduction to Music	3.0
	Term Credits	14.0

Term 3

EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 115	Reasoning about Numbers and Quantity (4-8)	3.0
EDUC 314	Science Teaching Methods	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 173 or 107	Introduction to Analysis C Probability and Statistics for Liberal Arts	3.0
	Term Credits	16.0

Term 4

BIO 162	General Biology II	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 223	Teaching the Middle School Child	3.0
HIST 275	History of Pennsylvania	3.0
Free Elective		3.0
	Term Credits	16.0

Term 5

EDUC 240	Proportional Reasoning in Middle School	3.0
EDUC 284	Teaching Life Science in the Middle School	3.0
EDUC 285	Teaching Physical Science in the Middle School	3.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
PHYS 151	Applied Physics	3.0
	Term Credits	15.0

Term 6

ECON 201	Principles of Microeconomics	4.0
EDEX 346	Literacy and Content Skill Development PreK-8	3.0
EDUC 216	Diversity and Today's Teacher	3.0
PSY 101	General Psychology I	3.0
Free Elective		3.0
	Term Credits	16.0

Term 7

CHEM 111	General Chemistry I	4.0
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
PSY 320 [WI]	Educational Psychology	3.0
SOC 335	Sociology of Education	3.0
	Term Credits	17.0

Term 8

EDUC 306	Assessment of Young Children	3.0
EDUC 315	Secondary Science Teaching Methods	3.0
EDUC 355	Social Studies Teaching Methods	3.0
ENVS 260	Environmental Science and Society	3.0
MTED 418	Mathematics Methods and Content	3.0
	Term Credits	15.0

Term 9

EDLT 326	Technology Applications for Learning	3.0
EDUC 286	Teaching Earth & Space Science for Middle School	3.0
EDUC 416	Introduction to Math Teaching Methods (4-8)	3.0
EDUC 432	Algebraic Reasoning	3.0
Free electives		4.0
	Term Credits	16.0

Term 10

EDUC 292	Science Methods for Middle School	3.0
EDUC 417	Advanced Math Teaching Methods (4-8)	3.0
EDUC 433	Functions in Middle School Math	3.0
PSY 330	Cognitive Psychology	3.0
	Term Credits	12.0

Term 11

EDUC 405	Senior Pedagogy Seminar	1.0
EDUC 410 [WI]	Student Teaching	9.0
Free Elective		3.0
	Term Credits	13.0

Term 12

ARTH 101	History of Art I: Ancient to Medieval	3.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
Select one of the following:		4.0
HIST 201	United States History to 1815	
HIST 202	United States History, 1815-1900	
HIST 203	United States History since 1900	
Free Electives		3.0
	Term Credits	13.0

Total Credit: 180.0

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José Luis Chávez, EdD *(University of Southern California)*. Clinical Professor. Higher education leadership and administration.

Rebecca Clothey, PhD *(University of Pittsburgh)*. Associate Professor. Comparative and international education, education of ethnic and linguistic minorities, sociology of education.

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Salvatore V. Falletta, EdD *(North Carolina State University)*. Clinical Professor. Human Resource intelligence (i.e., HR research and analytics practices); HRD assessment, measurement, and evaluation models and taxonomies; organizational diagnostic models; web-based employee and organizational survey methods, and computational modeling.

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Aroutis N. Foster, PhD *(Michigan State University)*. Associate Professor. Educational psychology and educational technology, especially the following: Motivation; Technological Pedagogical Content Knowledge

(TPACK); Immersive Interactive Digital Environments (simulation, games, virtual realities.

Kathy Geller, PhD *(Fielding Graduate University).* Associate Clinical Professor. Educational leadership and management.

Rajashi Ghosh, PhD *(University of Louisville, Kentucky) Department Chair for Policy, Organization & Leadership.* Associate Professor. Mentoring and leader development, workplace Incivility, workplace learning and development.

John M. Gould, PhD *(University of Pittsburgh) Harrisburg EdD Educational Leadership & Change Program.* Clinical Professor. Change leadership, curriculum re-design, the impact of technology on learning.

Dominic F. Gullo, PhD *(Indiana University).* Professor. Studying the relative and long-range effects of early schooling experiences in prekindergarten and kindergarten on children's achievement and social adaptation to school routine.

H. Bernard Hall, PhD *(Temple University).* Assistant Professor. Hip-hop Pedagogy , English Education, Urban Teacher Education.

Penny Hammrich, PhD *(University of Minnesota) Dean.* Distinguished University Professor. Urban education; science education; genetics; gender equity; science knowledge for conceptual teaching; sport science.

Paul Harrington, PhD *(University of Massachusetts, Boston) Director, Center for Labor Markets and Policy.* Professor. Teen and young adult job access; economic outlook, college labor market; workforce development, planning, and development; vocational rehabilitation and job market transition.

Michael J. Haslip, PhD *(Old Dominion University).* Assistant Professor. Early childhood education, social and emotional learning, child guidance strategies, effects of public pre-school attendance.

Deanna Hill, JD, PhD *(University of Pittsburgh).* Associate Clinical Professor. Higher education, international education, education law, education policy

Erin Horvat, PhD *(University of California, Los Angeles) Senior Vice Provost for Faculty Affairs.* Professor. Urban education, access and equity, high school dropout, parent involvement/family involvement, community engagement in research.

Jennifer Katz-Buonincontro, PhD *(University of Oregon) Associate Dean of Research.* Associate Professor. Educational administration, leadership development, survey & instrument design.

Larry Keiser, PhD *(Drexel University).* Associate Clinical Professor. Education and corporate/business leaders' creativity and entrepreneurial mindsets; creative school/work environments; neuroscience of creativity; everyday creativity for teachers and educators.

Kristine Kelly, PhD *(University of Wisconsin, Madison).* Associate Clinical Professor. Sociology of gender and development; anthropology of policy; comparative and international education; qualitative research methods; Vietnam and Southeast Asia.

Cameron Kiosoglous, PhD *(Virginia Tech University) Program Director.* Assistant Clinical Professor. Coached on the USRowing National Team staff since 2002, including the 2004, 2008, 2012, and 2016 Olympic Games; coaching development; measuring coaching quality; self-insight

and reflective practices; coaching leadership; conference presenter; published author.

Valerie Klein, PhD *(Amherst College).* Associate Clinical Professor. Mathematics learning and teaching; teacher's use of formative assessment in mathematics; creating opportunities for rich problem solving in the classroom; examining teachers growth and change; qualitative research methods.

Michael G. Kozak, Ed.D. *(Rowan University).* Assistant Clinical Professor. Leadership, STEAM, online and blended learning environments, systems thinking, experiential learning, K-12 education, and facilitating change

Amanda Lannie, PhD *(Syracuse University).* Assistant Clinical Professor. Applied behavior analysis and special education; School-based consultation; system-wide interventions as a mechanism for delivery supports to all students; Designing effective and efficient interventions for students with emotional/behavioral disorders.

Vera Lee, EdD *(University of Pennsylvania).* Assistant Clinical Professor. Practitioner Research in online courses to explore inservice/preservice teachers' emerging understandings about issues of diversity; the development of information/digital literacies of urban youth; English language learners.

Bruce Levine, JD *(New York University).* Associate Clinical Professor. Educational policy, school law, public-private partnerships, intersection of business and education.

Kristine Lewis-Grant, PhD *(Temple University).* Clinical Professor. Experiences of students of African descent at predominantly white colleges and universities, college access and college student development, youth civic engagement in urban school reform, qualitative research and evaluation.

William Lynch, PhD *(University of Maryland).* Professor. Curriculum and educational leadership, educational technology, distance learning policy development, higher and adult education.

Constance Lyttle, PhD, JD *(University of Pittsburgh, Duquesne University).* Clinical Professor. Legal rights of gifted and talented children and children with disabilities; inclusive education of exceptional children; special education mediation; special education IEP/IFSP facilitation; resolution session facilitation

Joy Phillips, PhD *(The University of Texas at Austin).* Associate Clinical Professor. Visionary leadership in theory and practice, school reform as innovative problem-setting, thinking qualitatively about school reform. thinking about school reform by drawing, Educational Leadership Program Assessment.

Joyce Pittman, PhD *(Iowa State University of Science and Technology).* Clinical Professor. Curriculum and instruction K-16; teaching English as a foreign language (TEFL); instructional design business education and administration; industrial and career technology; oral and written communication; research methodology; instructional and assistive technology assessment; online learning pedagogy

Kathleen Provinzano, PhD *(Marywood University).* Assistant Professor. Educational administration.

Lori Severino, EdD *(Neumann University).* Assistant Professor. Special education, differentiated instruction, reading, Wilson language, multi-

sensory instruction, reading comprehension, assessment, adolescent literacy.

Jason Silverman, PhD *(Vanderbilt University).* Professor. Teaching and learning of advanced mathematical ideas (algebra and calculus); improving teachers' ability to orchestrate and sustain inquiry-based and discussion-based instruction; technology in mathematics education.

Joanne Sloand, EdD *(Duquesne University) Department Chair for Teaching, Learning & Curriculum.* Associate Clinical Professor. Special Education Leadership, Trauma-informed care, Parent engagement in special education service delivery.

Brian Smith, PhD *(Northwestern University) Senior Associate Dean of Academic Affairs.* Professor. Design of computer-based learning environments, computer science education, human-computer interaction, creativity and innovation; design sciences; informal/everyday learning.

Toni A. Sondergeld, PhD *(University of Toledo).* Associate Professor. Cognitive and affective assessment development; program/grant evaluation; high stakes testing measurement; STEM education; urban education

Nancy Butler Songer, PhD *(University of California, Davis).* Distinguished Professor. STEM education, urban education, educational assistance

Bridget Sweeney Blakely, PhD *(Temple University).* Assistant Clinical Professor. Consultation; Positive Behavior Interventions and Supports (PBIS); Response to Intervention (Rtl); Systems-level change; performance feedback

Mary Jean Tecce DeCarlo, EdD *(University of Pennsylvania).* Associate Clinical Professor. Early literacy development, learning differences, knowledge construction, urban education.

Sarah P. Ulrich, EdD *(Saint Joseph's University) Associate Dean of Teacher Education and Undergraduate Affairs.* Clinical Professor. Cross-cultural, language and academic development, school reform, teacher preparation, teacher retention, teacher residencies in urban contexts.

Sheila Vaidya, PhD *(Temple University).* Professor. Educational psychology, school psychology, research design.

Christina Vorndran, PhD *(Louisiana State University) Program Director, Applied Behavior Analysis and Special Education.* Clinical Professor. Designing effective and efficient community-based interventions, Severe behavior disorders, Functional behavior assessment

Christopher G. Wright, PhD *(Tufts University).* Assistant Professor. Engineering and science education, Urban education, elementary teacher education.

Emeritus Faculty

Mary Jo Grdina, PhD *(Case Western Reserve University).* Clinical Professor. Undergraduate studies, science education, curriculum design.

Fredricka K. Reisman, PhD *(Syracuse University) Director of the Torrance Center for Creativity and Innovation.* Professor Emeritus. Mathematics education, learning mathematics, mathematics pedagogy, teacher education, heuristic diagnostic learning and teaching, theory and research in creativity and applied creativity.

Elementary Education: Middle Level Science and English

Major: Elementary Education
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: One Co-op (Four years)
Classification of Instructional (CIP) code: 13.1202
Standard Occupational Classification (SOC) code: 25-2022

About the Concentration

This certification option within the BS in Elementary Education (p. 432) enables teachers to work with students in grades 4-6 across subjects, and with students in grades 7-8 in the core academic subjects of science and English.

This program addresses the complexities of adolescent development, through discussion of theories. It explores the middle school environment, developmentally appropriate middle school programs, strategies for supporting students through the transition to middle school, and the impact of peer pressure on the middle school child.

In addition, this certification area provides: (1) training and methodology for teaching physical and life sciences (including using an inquiry-based model of learning, developing authentic assessments, drawing upon a variety of tools, creating and maintaining a safe laboratory) as well as other skills necessary to meet the needs of diverse learners in science education; (2) courses devoted to teaching age-appropriate reading skills, how to teach and assess writing effectively, as well as a specialized course in the genre of young adult fiction.

The Pennsylvania Department of Education (PDE) is currently in the process of restructuring its requirements for Special Education Certification, grades PK-8 and grades 7-12. While the requirements are mandated by the PDE, the School of Education is committed to working with both current and new students to fulfill the competencies as required. For additional information, please contact the School of Education's undergraduate Academic Advising Department at 215-895-6770.

Additional Information

For more information about the program, visit the School of Education (http://drexel.edu/soe/) website.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education/Content Requirements

ARTH 101	History of Art I: Ancient to Medieval	3.0
BIO 161	General Biology I	3.0
BIO 162	General Biology II	3.0
CHEM 111	General Chemistry I	4.0
CIVC 101	Introduction to Civic Engagement	1.0
COM 111	Principles of Communication	3.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	

ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
ENGL 304	Young Adult Fiction	3.0
ENVS 260	Environmental Science and Society	3.0
Select one of the following		4.0
HIST 201	United States History to 1815	
or HIST 202	United States History, 1815-1900	
or HIST 203	United States History since 1900	
HIST 275	History of Pennsylvania	3.0
LING 101	Introduction to Linguistics	3.0
MATH 171	Introduction to Analysis A	3.0
MATH 172	Introduction to Analysis B	3.0
MATH 173	Introduction to Analysis C	3.0
or MATH 107	Probability and Statistics for Liberal Arts	
MUSC 130	Introduction to Music	3.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
PHYS 151	Applied Physics	3.0
PSY 101	General Psychology I	3.0
PSY 320 [WI]	Educational Psychology	3.0
PSY 330	Cognitive Psychology	3.0
SOC 335	Sociology of Education	3.0
UNIV T101	The Drexel Experience	1.0
Free electives		25.0
Pedagogy Requirements		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDEX 346	Literacy and Content Skill Development PreK-8	3.0
EDLT 325	Design for Learning with Digital Media	3.0
EDLT 326	Technology Applications for Learning	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	3.0
EDUC 123	Adolescent Development	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 223	Teaching the Middle School Child	3.0
EDUC 256	Teaching Writing Grades 4-8	3.0
EDUC 257	Content Area Reading (Grades 4-8)	3.0
EDUC 284	Teaching Life Science in the Middle School	3.0
EDUC 285	Teaching Physical Science in the Middle School	3.0
EDUC 286	Teaching Earth & Space Science for Middle School	3.0
EDUC 292	Science Methods for Middle School	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 306	Assessment of Young Children	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 328	Language Arts Processes 4-8	3.0
EDUC 355	Social Studies Teaching Methods	3.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
MTED 418	Mathematics Methods and Content	3.0
Student Teaching Experience		
EDUC 410 [WI]	Student Teaching	9.0
Total Credits		180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Middle Level Science and English: Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

4 YR UG Co-op Concentration

Term 1		Credits
BIO 161	General Biology I	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 123	Adolescent Development	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 171	Introduction to Analysis A	3.0
UNIV T101	The Drexel Experience	1.0
	Term Credits	17.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
COM 111	Principles of Communication	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 172	Introduction to Analysis B	3.0
MUSC 130	Introduction to Music	3.0
	Term Credits	14.0
Term 3		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
LING 101	Introduction to Linguistics	3.0
MATH 173 or 107	Introduction to Analysis C Probability and Statistics for Liberal Arts	3.0
	Term Credits	13.0
Term 4		
BIO 162	General Biology II	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 223	Teaching the Middle School Child	3.0

HIST 275	History of Pennsylvania	3.0
PSY 101	General Psychology I	3.0
	Term Credits	16.0
Term 5		
EDUC 265	Instructing English Language Learners	3.0
EDUC 284	Teaching Life Science in the Middle School	3.0
EDUC 328	Language Arts Processes 4-8	3.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
PHYS 151	Applied Physics	3.0
	Term Credits	15.0
Term 6		
EDEX 346	Literacy and Content Skill Development PreK-8	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 257	Content Area Reading (Grades 4-8)	3.0
ENGL 304	Young Adult Fiction	3.0
Free Elective		3.0
	Term Credits	15.0
Term 7		
CHEM 111	General Chemistry I	4.0
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
PSY 320 [WI]	Educational Psychology	3.0
SOC 335	Sociology of Education	3.0
	Term Credits	17.0
Term 8		
EDUC 256	Teaching Writing Grades 4-8	3.0
EDUC 306	Assessment of Young Children	3.0
EDUC 355	Social Studies Teaching Methods	3.0
ENVS 260	Environmental Science and Society	3.0
MTED 418	Mathematics Methods and Content	3.0
	Term Credits	15.0
Term 9		
EDLT 326	Technology Applications for Learning	3.0
EDUC 286	Teaching Earth & Space Science for Middle School	3.0
Free Electives		7.0
	Term Credits	13.0
Term 10		
ECON 201	Principles of Microeconomics	4.0
EDUC 292	Science Methods for Middle School	3.0
PSY 330	Cognitive Psychology	3.0
Free Elective		6.0
	Term Credits	16.0
Term 11		
EDUC 405	Senior Pedagogy Seminar	1.0
EDUC 410 [WI]	Student Teaching	9.0
Free Elective		3.0
	Term Credits	13.0
Term 12		
ARTH 101	History of Art I: Ancient to Medieval	3.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
Select one of the following:		4.0
HIST 201	United States History to 1815	
HIST 202	United States History, 1815-1900	
HIST 203	United States History since 1900	
Free Elective		6.0
	Term Credits	16.0

Total Credit: 180.0

Education Faculty

Jennifer Adams, EdD *(Harvard University)*. Associate Professor. Comparative and international education; Poverty and education; Child welfare; Educational policy.

Ayana Allen, PhD *(Texas A&M University)*. Assistant Professor. Urban education; Identity construction in school contexts; Urban school transformation.

Kristen Betts, EdD *(George Washington University)*. Clinical Professor. Higher education administration and governance, online blended education, instructional design and educational technology, program assessment and evaluation.

Eric Brewe, PhD *(Arizona State University)*. Associate Professor. Physics Education Research, introductory course reform, network analysis in learning, neuromechanisms of learning.

José Luis Chávez, EdD *(University of Southern California)*. Clinical Professor. Higher education leadership and administration.

Rebecca Clothey, PhD *(University of Pittsburgh)*. Associate Professor. Comparative and international education, education of ethnic and linguistic minorities, sociology of education.

James Connell, PhD *(Louisiana State University) Founding Clinical Core Director and Research Fellow, A.J. Drexel Autism Institute*. Associate Professor. Identifying the variables that influence adult behavior change in community settings; autism intervention; widespread dissemination of evidence-based interventions in school and community settings.

Kareem Edouard, PhD *(Stanford University)*. Assistant Professor. Educational technology; internet-based STEM learning; equity and inclusion in STEM education

Salvatore V. Falletta, EdD *(North Carolina State University)*. Clinical Professor. Human Resource intelligence (i.e., HR research and analytics practices); HRD assessment, measurement, and evaluation models and taxonomies; organizational diagnostic models; web-based employee and organizational survey methods, and computational modeling.

Alonzo M. Flowers, III, PhD *(Texas A&M University)*. Associate Professor. Education issues including academic identity development of men of color in STEM education, diversity in teaching & learning, research methods/design, and college student development in higher education

Aroutis N. Foster, PhD *(Michigan State University)*. Associate Professor. Educational psychology and educational technology, especially the following: Motivation; Technological Pedagogical Content Knowledge (TPACK); Immersive Interactive Digital Environments (simulation, games, virtual realities.

Kathy Geller, PhD *(Fielding Graduate University)*. Associate Clinical Professor. Educational leadership and management.

Rajashi Ghosh, PhD *(University of Louisville, Kentucky) Department Chair for Policy, Organization & Leadership*. Associate Professor. Mentoring and leader development, workplace Incivility, workplace learning and development.

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Jason Silverman, PhD *(Vanderbilt University)*. Professor. Teaching and learning of advanced mathematical ideas (algebra and calculus); improving teachers' ability to orchestrate and sustain inquiry-based and discussion-based instruction; technology in mathematics education.

Joanne Sloand, EdD *(Duquesne University) Department Chair for Teaching, Learning & Curriculum*. Associate Clinical Professor. Special Education Leadership, Trauma-informed care, Parent engagement in special education service delivery.

Brian Smith, PhD *(Northwestern University) Senior Associate Dean of Academic Affairs*. Professor. Design of computer-based learning environments, computer science education, human-computer interaction, creativity and innovation; design sciences; informal/everyday learning.

Toni A. Sondergeld, PhD *(University of Toledo)*. Associate Professor. Cognitive and affective assessment development; program/grant evaluation; high stakes testing measurement; STEM education; urban education

Nancy Butler Songer, PhD *(University of California, Davis)*. Distinguished Professor. STEM education, urban education, educational assistance

Bridget Sweeney Blakely, PhD *(Temple University)*. Assistant Clinical Professor. Consultation; Positive Behavior Interventions and Supports (PBIS); Response to Intervention (RtI); Systems-level change; performance feedback

Mary Jean Tecce DeCarlo, EdD *(University of Pennsylvania)*. Associate Clinical Professor. Early literacy development, learning differences, knowledge construction, urban education.

Sarah P. Ulrich, EdD *(Saint Joseph's University) Associate Dean of Teacher Education and Undergraduate Affairs*. Clinical Professor. Cross-cultural, language and academic development, school reform, teacher preparation, teacher retention, teacher residencies in urban contexts.

Sheila Vaidya, PhD *(Temple University)*. Professor. Educational psychology, school psychology, research design.

Christina Vorndran, PhD *(Louisiana State University) Program Director, Applied Behavior Analysis and Special Education*. Clinical Professor. Designing effective and efficient community-based interventions, Severe behavior disorders, Functional behavior assessment

Christopher G. Wright, PhD *(Tufts University)*. Assistant Professor. Engineering and science education, Urban education, elementary teacher education.

Emeritus Faculty

Mary Jo Grdina, PhD *(Case Western Reserve University)*. Clinical Professor. Undergraduate studies, science education, curriculum design.

Fredricka K. Reisman, PhD *(Syracuse University) Director of the Torrance Center for Creativity and Innovation*. Professor Emeritus. Mathematics education, learning mathematics, mathematics pedagogy, teacher education, heuristic diagnostic learning and teaching, theory and research in creativity and applied creativity.

Education: Non-Certification

Major: Education
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: One Co-op (Four years); No Co-op (Four years)
Classification of Instructional Programs (CIP) code: 13.0101
Standard Occupational Classification (SOC) code: 25-1081

About the Program

Note: Students will not receive Teaching Certification at the completion of this program.

The Bachelor of Science major Education-Non Certification Track prepares students who are informed about theories of teaching and learning and recognize what happened in PK-16 schooling, and then use that information to support teaching and learning in non-school based settings such as educational non-profits, youth advocacy or educational

entrepreneurial ventures. Students learn skills and knowledge necessary to design, develop, and implement learning environments for a variety of settings.

Admission Requirements

- Three years of high school math (algebra I and II, geometry)
- One year of high school lab science
- Standard Undergraduate Application with essay and 2 letters of recommendation
- Standard Standardized Test Scores

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education/Content Requirements

BIO 100	Applied Cells, Genetics & Physiology	3.0
or BIO 161	General Biology I	
BIO 101	Applied Biological Diversity, Ecology & Evolution	3.0
or BIO 162	General Biology II	
CHEM 111	General Chemistry I	4.0
CIVC 101	Introduction to Civic Engagement [*]	1.0
COM 111	Principles of Communication	3.0
COOP 101	Career Management and Professional Development [*]	0.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
English (Literature) Elective [**]		3.0
ENVS 260	Environmental Science and Society	3.0
HIST 275	History of Pennsylvania	3.0
MATH 171	Introduction to Analysis A	3.0
MATH 172	Introduction to Analysis B	3.0
MATH 173	Introduction to Analysis C	3.0
or MATH 107	Probability and Statistics for Liberal Arts	
MUSC 130	Introduction to Music	3.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
PHYS 151	Applied Physics	3.0
PSY 101	General Psychology I	3.0
PSY 320 [WI]	Educational Psychology	3.0
PSY 330	Cognitive Psychology	3.0
SOC 335	Sociology of Education	3.0
UNIV T101	The Drexel Experience [*]	1.0
Pedagogy		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar [***]	3.0
EDUC 120	Child Development I: Typical Development	3.0
EDUC 121	Child Development II: Atypical Development	3.0
EDUC 123	Adolescent Development	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0

EDUC 210	Early Language Development	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 236	Early Literacy I	3.0
EDUC 306	Assessment of Young Children	3.0
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 326 [WI]	Language Arts Processes	3.0
EDUC 335	Engaging the Learner	3.0
EDUC 338	Expressive Arts for PK-4	3.0
EDUC 411	Family and Community Partnerships	3.0
Free Electives †		**52.0-54.0**
Total Credits		180.0-182.0

*   UNIV T101 and CIVC 101 are not required for Education transfer students, instead these 2 credits are replaced with free electives.

**   English (Literature) elective: Select course between ENGL 200 [WI] - ENGL 365

*** One credit course taken three times.

†   Suggested Electives: CRTV 301, CRTV 302, CRTV 303, EDEX 346, EDEX 366, EDLT 101, EDLT 103, EDLT 201, EDLT 238, EDLT 301, EDLT 353, EDUC 112, EDUC 113, EDUC 223, EDUC 305 [WI] , EDUC 314, EDUC 322, EDUC 355, EDUC 365, MTED 418, MTED 428, SCL 101, SCL 102, SCL 201, SCL 203.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

On-campus Full-Time Plan of Study

Term 1		Credits
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 120	Child Development I: Typical Development	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 171	Introduction to Analysis A	3.0
UNIV T101	The Drexel Experience	1.0
	Term Credits	14.0
Term 2		
BIO 100 or 161	Applied Cells, Genetics & Physiology General Biology I	3.0
CIVC 101	Introduction to Civic Engagement	1.0
COM 111	Principles of Communication	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 121	Child Development II: Atypical Development	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 172	Introduction to Analysis B	3.0
	Term Credits	17.0
Term 3		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 123	Adolescent Development	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0

MATH 173 or 107	Introduction to Analysis C Probability and Statistics for Liberal Arts	3.0
MUSC 130	Introduction to Music	3.0
PSY 101	General Psychology I	3.0
	Term Credits	19.0
Term 4		
CHEM 111	General Chemistry I	4.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
PSY 330	Cognitive Psychology	3.0
Free Electives		6.0
	Term Credits	17.0
Term 5		
BIO 101 or 162	Applied Biological Diversity, Ecology & Evolution General Biology II	3.0
COOP 101	Career Management and Professional Development	0.0
EDUC 335	Engaging the Learner	3.0
Free Electives		6.0
	Term Credits	12.0
Term 6		
EDUC 236	Early Literacy I	3.0
NFS 100 & NFS 101	Nutrition, Foods, and Health	3.0
PSY 320 [WI]	Educational Psychology	3.0
Free Electives		6.0
	Term Credits	15.0
Term 7		
EDUC 210	Early Language Development	3.0
EDUC 306	Assessment of Young Children	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
HIST 275	History of Pennsylvania	3.0
Free Elective		3.0
	Term Credits	15.0
Term 8		
ECON 201	Principles of Microeconomics	4.0
EDUC 326 [WI]	Language Arts Processes	3.0
ENGL 200 - ENGL 365 Literature Elective		3.0
PHYS 151	Applied Physics	3.0
Free Elective		3.0
	Term Credits	16.0
Term 9		
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 338	Expressive Arts for PK-4	3.0
Free Electives		6.0
	Term Credits	15.0
Term 10		
EDUC 308	Creating a Positive Classroom Climate	3.0
Free Electives		9.0
	Term Credits	12.0
Term 11		
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 316	Teaching in Urban Contexts	3.0
SOC 335	Sociology of Education	3.0
Free Electives		6.0
	Term Credits	15.0
Term 12		
EDUC 411	Family and Community Partnerships	3.0
ENVS 260	Environmental Science and Society	3.0

Free Electives		7.0
	Term Credits	13.0

Total Credit: 180.0

Transfer/Online Part-Time Plan of Study

Term 1		Credits
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 171	Introduction to Analysis A	3.0
	Term Credits	10.0
Term 2		
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 120	Child Development I: Typical Development	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 172	Introduction to Analysis B	3.0
	Term Credits	10.0
Term 3		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 121	Child Development II: Atypical Development	3.0
MATH 173	Introduction to Analysis C	3.0
	Term Credits	10.0
Term 4		
EDUC 210	Early Language Development	3.0
EDUC 216	Diversity and Today's Teacher	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
HIST 275	History of Pennsylvania	3.0
	Term Credits	12.0
Term 5		
BIO 161	General Biology I	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
Free Elective		3.0
	Term Credits	10.0
Term 6		
BIO 162	General Biology II	3.0
MUSC 130	Introduction to Music	3.0
Free Elective		3.0
	Term Credits	9.0
Term 7		
EDUC 123	Adolescent Development	3.0
EDUC 236	Early Literacy I	3.0
ENGL 205 [WI]	American Literature I	3.0
	Term Credits	9.0
Term 8		
EDUC 306	Assessment of Young Children	3.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 335	Engaging the Learner	3.0
	Term Credits	9.0
Term 9		
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 326 [WI]	Language Arts Processes	3.0
PSY 101	General Psychology I	3.0
	Term Credits	9.0
Term 10		

EDUC 316	Teaching in Urban Contexts	3.0
NFS 100 & NFS 101	Nutrition, Foods, and Health	3.0
Free Elective		3.0
	Term Credits	9.0
Term 11		
EDUC 308	Creating a Positive Classroom Climate	3.0
SOC 335	Sociology of Education	3.0
Free Elective		3.0
	Term Credits	9.0
Term 12		
EDLT 325	Design for Learning with Digital Media	3.0
PHYS 151	Applied Physics	3.0
PSY 330	Cognitive Psychology	3.0
	Term Credits	9.0
Term 13		
EDUC 411	Family and Community Partnerships	3.0
Free Electives		6.0
	Term Credits	9.0
Term 14		
ENVS 260	Environmental Science and Society	3.0
PSY 320 [WI]	Educational Psychology	3.0
Free Elective		3.0
	Term Credits	9.0
Term 15		
COM 111	Principles of Communication	3.0
Free Electives		6.0
	Term Credits	9.0
Term 16		
EDUC 338	Expressive Arts for PK-4	3.0
Free Electives		6.0
	Term Credits	9.0
Term 17		
CHEM 111	General Chemistry I	4.0
Free Electives		6.0
	Term Credits	10.0
Term 18		
Free Electives		9.0
	Term Credits	9.0
Term 19		
ECON 201	Principles of Microeconomics	4.0
Free Electives		6.0
	Term Credits	10.0

Total Credit: 180.0

BS in Teacher Education

Major: Teacher Education
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.0 - 191.5
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 13.1205
Standard Occupational Classification (SOC) code: 25-2031

About the Program

The Bachelor of Science in Teacher Education program uses university-wide resources to prepare fully qualified teachers at the secondary education levels in various subjects of certification. The program applies the microcomputer in teaching and learning, and it is the only such program in the country to incorporate a six-month paid internship in

industry related to the candidate's area of certification (for example, a prospective chemistry teacher might co-op at a chemical company). Candidates pursuing the appropriate majors in the College of Arts and Sciences may also complete the requirements for certification within their area of study.

The BS in Teacher Education, is focused on secondary education, and provides graduates with the background to work with students in grades 7-12* in a specific subject area. Candidates may work with their academic advisor to satisfy teacher certification requirements for multiple areas if desired. Available certification areas include:

- Biology (p. 459)
- Chemistry (p. 463)
- Earth & Space Science (p. 466)
- English (p. 470)
- General Science (p. 474)
- Mathematics (p. 477)
- Physics (p. 481)
- Social Studies (p. 485)

The program requires that candidates have a B average (3.0 GPA) in content courses needed for teacher certification in addition to the grade of B or better in each EDEX, EDLT, EDUC and MTED courses throughout their time in the program. These requirements must be satisfied in order for Drexel to recommend the candidates for teacher certification upon graduation and/or be considered to have completed the program.

A benchmark to assist candidates in meeting the GPA and B grade requirements is the formal review of each candidate's content and pedagogy coursework at the end of the sophomore year. Candidates who meet these requirements, as well as pass the Basic Skills Exams; *Pre-service Academic Performance Assessment* (PAPA Reading, PAPA Writing, PAPA Mathematics) of the Pennsylvania Educator Certification Test (PECT) *or the Core Academic Skills for Educators in Reading, Writing and Mathematics Praxis Exams* according to Pennsylvania standards at that time, are officially accepted into Drexel's Teacher Preparation Program. Candidates who do not meet the requirements work with their academic advisor to develop a plan of action to work toward meeting the requirements, continue in the program to work toward the BS degree without being recommended for a teaching certificate, or explore another major.

Candidates participate in classroom observations and limited direct teaching experiences as a component of many of their pedagogy courses beginning in their freshman/first year. In the senior year, candidates who are officially accepted into the Teacher Preparation Program and maintain the 3.0 GPA and grade requirements, enroll and complete the 24-week, full-time, student-teaching experiences in their primary area of certification. Candidates must receive a grade of at least B in (and if applicable) and in all pedagogy (EDEX, EDLT, EDUC and MTED) coursework, as well as maintain an overall 3.0 GPA to be recommended for teacher certification.

Candidates who were not officially accepted into the Teacher Preparation Program and/or do not maintain the GPA and grade requirements but who are working towards the BS degree without being recommended for teacher certification take other courses as assigned by the Teacher Education Program Director and/or academic advisor to fulfill needed credits for the degree in lieu of student teaching.

Candidates pursuing the appropriate majors in the College of Arts and Sciences may also complete the requirements for certification within their area of study. For more information, contact the Program Coordinator for the School of Education at 215-895-6770.

Additional information is available at the School of Education's (http://www.drexel.edu/soe/) web site.

Education Faculty

Jennifer Adams, EdD *(Harvard University)*. Associate Professor. Comparative and international education; Poverty and education; Child welfare; Educational policy.

Ayana Allen, PhD *(Texas A&M University)*. Assistant Professor. Urban education; Identity construction in school contexts; Urban school transformation.

Kristen Betts, EdD *(George Washington University)*. Clinical Professor. Higher education administration and governance, online blended education, instructional design and educational technology, program assessment and evaluation.

Eric Brewe, PhD *(Arizona State University)*. Associate Professor. Physics Education Research, introductory course reform, network analysis in learning, neuromechanisms of learning.

José Luis Chávez, EdD *(University of Southern California)*. Clinical Professor. Higher education leadership and administration.

Rebecca Clothey, PhD *(University of Pittsburgh)*. Associate Professor. Comparative and international education, education of ethnic and linguistic minorities, sociology of education.

James Connell, PhD *(Louisiana State University) Founding Clinical Core Director and Research Fellow, A.J. Drexel Autism Institute*. Associate Professor. Identifying the variables that influence adult behavior change in community settings; autism intervention; widespread dissemination of evidence-based interventions in school and community settings.

Kareem Edouard, PhD *(Stanford University)*. Assistant Professor. Educational technology; internet-based STEM learning; equity and inclusion in STEM education

Salvatore V. Falletta, EdD *(North Carolina State University)*. Clinical Professor. Human Resource intelligence (i.e., HR research and analytics practices); HRD assessment, measurement, and evaluation models and taxonomies; organizational diagnostic models; web-based employee and organizational survey methods, and computational modeling.

Alonzo M. Flowers, III, PhD *(Texas A&M University)*. Associate Professor. Education issues including academic identity development of men of color in STEM education, diversity in teaching & learning, research methods/design, and college student development in higher education

Aroutis N. Foster, PhD *(Michigan State University)*. Associate Professor. Educational psychology and educational technology, especially the following: Motivation; Technological Pedagogical Content Knowledge (TPACK); Immersive Interactive Digital Environments (simulation, games, virtual realities.

Kathy Geller, PhD *(Fielding Graduate University)*. Associate Clinical Professor. Educational leadership and management.

Rajashi Ghosh, PhD *(University of Louisville, Kentucky) Department Chair for Policy, Organization & Leadership*. Associate Professor. Mentoring

and leader development, workplace Incivility, workplace learning and development.

John M. Gould, PhD *(University of Pittsburgh) Harrisburg EdD Educational Leadership & Change Program*. Clinical Professor. Change leadership, curriculum re-design, the impact of technology on learning.

Dominic F. Gullo, PhD *(Indiana University)*. Professor. Studying the relative and long-range effects of early schooling experiences in prekindergarten and kindergarten on children's achievement and social adaptation to school routine.

H. Bernard Hall, PhD *(Temple University)*. Assistant Professor. Hip-hop Pedagogy , English Education, Urban Teacher Education.

Penny Hammrich, PhD *(University of Minnesota) Dean*. Distinguished University Professor. Urban education; science education; genetics; gender equity; science knowledge for conceptual teaching; sport science.

Paul Harrington, PhD *(University of Massachusetts, Boston) Director, Center for Labor Markets and Policy*. Professor. Teen and young adult job access; economic outlook, college labor market; workforce development, planning, and development; vocational rehabilitation and job market transition.

Michael J. Haslip, PhD *(Old Dominion University)*. Assistant Professor. Early childhood education, social and emotional learning, child guidance strategies, effects of public pre-school attendance.

Deanna Hill, JD, PhD *(University of Pittsburgh)*. Associate Clinical Professor. Higher education, international education, education law, education policy

Erin Horvat, PhD *(University of California, Los Angeles) Senior Vice Provost for Faculty Affairs*. Professor. Urban education, access and equity, high school dropout, parent involvement/family involvement, community engagement in research.

Jennifer Katz-Buonincontro, PhD *(University of Oregon) Associate Dean of Research*. Associate Professor. Educational administration, leadership development, survey & instrument design.

Larry Keiser, PhD *(Drexel University)*. Associate Clinical Professor. Education and corporate/business leaders' creativity and entrepreneurial mindsets; creative school/work environments; neuroscience of creativity; everyday creativity for teachers and educators.

Kristine Kelly, PhD *(University of Wisconsin, Madison)*. Associate Clinical Professor. Sociology of gender and development; anthropology of policy; comparative and international education; qualitative research methods; Vietnam and Southeast Asia.

Cameron Kiosoglous, PhD *(Virginia Tech University) Program Director*. Assistant Clinical Professor. Coached on the USRowing National Team staff since 2002, including the 2004, 2008, 2012, and 2016 Olympic Games; coaching development; measuring coaching quality; self-insight and reflective practices; coaching leadership; conference presenter; published author.

Valerie Klein, PhD *(Amherst College)*. Associate Clinical Professor. Mathematics learning and teaching; teacher's use of formative assessment in mathematics; creating opportunities for rich problem solving in the classroom; examining teachers growth and change; qualitative research methods.

Michael G. Kozak, Ed.D. *(Rowan University)*. Assistant Clinical Professor. Leadership, STEAM, online and blended learning environments, systems thinking, experiential learning, K-12 education, and facilitating change

Amanda Lannie, PhD *(Syracuse University)*. Assistant Clinical Professor. Applied behavior analysis and special education; School-based consultation; system-wide interventions as a mechanism for delivery supports to all students; Designing effective and efficient interventions for students with emotional/behavioral disorders.

Vera Lee, EdD *(University of Pennsylvania)*. Assistant Clinical Professor. Practitioner Research in online courses to explore inservice/preservice teachers' emerging understandings about issues of diversity; the development of information/digital literacies of urban youth; English language learners.

Bruce Levine, JD *(New York University)*. Associate Clinical Professor. Educational policy, school law, public-private partnerships, intersection of business and education.

Kristine Lewis-Grant, PhD *(Temple University)*. Clinical Professor. Experiences of students of African descent at predominantly white colleges and universities, college access and college student development, youth civic engagement in urban school reform, qualitative research and evaluation.

William Lynch, PhD *(University of Maryland)*. Professor. Curriculum and educational leadership, educational technology, distance learning policy development, higher and adult education.

Constance Lyttle, PhD, JD *(University of Pittsburgh, Duquesne University)*. Clinical Professor. Legal rights of gifted and talented children and children with disabilities; inclusive education of exceptional children; special education mediation; special education IEP/IFSP facilitation; resolution session facilitation

Joy Phillips, PhD *(The University of Texas at Austin)*. Associate Clinical Professor. Visionary leadership in theory and practice, school reform as innovative problem-setting, thinking qualitatively about school reform. thinking about school reform by drawing, Educational Leadership Program Assessment.

Joyce Pittman, PhD *(Iowa State University of Science and Technology)*. Clinical Professor. Curriculum and instruction K-16; teaching English as a foreign language (TEFL); instructional design business education and administration; industrial and career technology; oral and written communication; research methodology; instructional and assistive technology assessment; online learning pedagogy

Kathleen Provinzano, PhD *(Marywood University)*. Assistant Professor. Educational administration.

Lori Severino, EdD *(Neumann University)*. Assistant Professor. Special education, differentiated instruction, reading, Wilson language, multi-sensory instruction, reading comprehension, assessment, adolescent literacy.

Jason Silverman, PhD *(Vanderbilt University)*. Professor. Teaching and learning of advanced mathematical ideas (algebra and calculus); improving teachers' ability to orchestrate and sustain inquiry-based and discussion-based instruction; technology in mathematics education.

Joanne Sloand, EdD *(Duquesne University) Department Chair for Teaching, Learning & Curriculum*. Associate Clinical Professor. Special

Education Leadership, Trauma-informed care, Parent engagement in special education service delivery.

Brian Smith, PhD *(Northwestern University) Senior Associate Dean of Academic Affairs.* Professor. Design of computer-based learning environments, computer science education, human-computer interaction, creativity and innovation; design sciences; informal/everyday learning.

Toni A. Sondergeld, PhD *(University of Toledo).* Associate Professor. Cognitive and affective assessment development; program/grant evaluation; high stakes testing measurement; STEM education; urban education

Nancy Butler Songer, PhD *(University of California, Davis).* Distinguished Professor. STEM education, urban education, educational assistance

Bridget Sweeney Blakely, PhD *(Temple University).* Assistant Clinical Professor. Consultation; Positive Behavior Interventions and Supports (PBIS); Response to Intervention (RtI); Systems-level change; performance feedback

Mary Jean Tecce DeCarlo, EdD *(University of Pennsylvania).* Associate Clinical Professor. Early literacy development, learning differences, knowledge construction, urban education.

Sarah P. Ulrich, EdD *(Saint Joseph's University) Associate Dean of Teacher Education and Undergraduate Affairs.* Clinical Professor. Cross-cultural, language and academic development, school reform, teacher preparation, teacher retention, teacher residencies in urban contexts.

Sheila Vaidya, PhD *(Temple University).* Professor. Educational psychology, school psychology, research design.

Christina Vorndran, PhD *(Louisiana State University) Program Director, Applied Behavior Analysis and Special Education.* Clinical Professor. Designing effective and efficient community-based interventions, Severe behavior disorders, Functional behavior assessment

Christopher G. Wright, PhD *(Tufts University).* Assistant Professor. Engineering and science education, Urban education, elementary teacher education.

Emeritus Faculty

Mary Jo Grdina, PhD *(Case Western Reserve University).* Clinical Professor. Undergraduate studies, science education, curriculum design.

Fredricka K. Reisman, PhD *(Syracuse University) Director of the Torrance Center for Creativity and Innovation.* Professor Emeritus. Mathematics education, learning mathematics, mathematics pedagogy, teacher education, heuristic diagnostic learning and teaching, theory and research in creativity and applied creativity.

Teacher Education: Biology

Major: Teacher Education
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 184.5
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 13.1205
Standard Occupational Classification (SOC) code: 25-2031

About the Biology Concentration

Certification is for grades 7- 12

This certification option within the BS in Teacher Education (p. 456) emphasizes coursework in the biological sciences, including genetics, morphology and physiology, biochemistry, microbiology, and ecology. Candidates may also choose to pursue a second certification in chemistry and/or environmental education.

Additional Information

For more information about the program, visit the School of Education (http://www.drexel.edu/soe/) website.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Degree Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
HIST 289	History of Science: Enlightenment to Modernity	4.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
PHIL 251	Ethics	3.0
PSY 101	General Psychology I	3.0
PSY 320 [WI]	Educational Psychology	3.0
UNIV T101	The Drexel Experience	1.0
Science Requirements		
BIO 122	Cells and Genetics	4.5
BIO 124	Evolution & Organismal Diversity	4.5
BIO 126	Physiology and Ecology	4.5
BIO 201	Human Physiology I	4.0
BIO 215	Techniques in Cell Biology	3.0
BIO 218	Principles of Molecular Biology	4.0
BIO 220	Essential Microbiology	3.0
BIO 228	Evolutionary Biology & Human Health	3.0
BIO 306	Biochemistry Laboratory	2.0
BIO 373	Developmental Biology	3.0
BIO 374	Developmental Biology Lab	2.0
BIO 404	Structure and Function of Biomolecules	4.0
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
CHEM 241	Organic Chemistry I	4.0
CHEM 242	Organic Chemistry II	4.0
CHEM 244	Organic Chemistry Laboratory I	3.0
ENVS 230	General Ecology	3.0
ENVS 284	Physiological and Population Ecology	3.0
PHYS 131	Survey of the Universe	3.0
PHYS 152	Introductory Physics I	4.0
Pedagogy Requirements		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0

EDEX 366	Literacy and Content Skill Development 7-12	3.0
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	3.0
EDUC 113	Organizational Structure of Secondary Schools	3.0
EDUC 123	Adolescent Development	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 223	Teaching the Middle School Child	3.0
EDUC 258	Reading in the Content Areas	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 315	Secondary Science Teaching Methods	3.0
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 322	Evaluation of Instruction	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
Student Teaching Experience		
EDUC 409	Student Teaching Seminar I	9.0
EDUC 410 [WI]	Student Teaching	9.0
Total Credits		184.5

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Biology Concentration: Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
BIO 122	Cells and Genetics	4.5
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121	Calculus I	4.0
UNIV T101	The Drexel Experience	1.0
	Term Credits	16.5
Term 2		
BIO 124	Evolution & Organismal Diversity	4.5
CIVC 101	Introduction to Civic Engagement	1.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 113	Organizational Structure of Secondary Schools	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122	Calculus II	4.0
	Term Credits	16.5
Term 3		
BIO 126	Physiology and Ecology	4.5
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 123	Adolescent Development	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 123	Calculus III	4.0
	Term Credits	18.5
Term 4		
BIO 201	Human Physiology I	4.0
BIO 218	Principles of Molecular Biology	4.0
CHEM 101	General Chemistry I	3.5
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
	Term Credits	15.5
Term 5		
BIO 215	Techniques in Cell Biology	3.0
BIO 220	Essential Microbiology	3.0
CHEM 102	General Chemistry II	4.5
EDUC 223	Teaching the Middle School Child	3.0
EDUC 322	Evaluation of Instruction	3.0
	Term Credits	16.5
Term 6		
BIO 373	Developmental Biology	3.0
BIO 374	Developmental Biology Lab	2.0
COOP 101	Career Management and Professional Development	0.0
EDUC 258	Reading in the Content Areas	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
PHYS 152	Introductory Physics I	4.0
	Term Credits	16.0
Term 7		
CHEM 241	Organic Chemistry I	4.0
CHEM 244	Organic Chemistry Laboratory I	3.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
PSY 101	General Psychology I	3.0
	Term Credits	13.0
Term 8		
BIO 228	Evolutionary Biology & Human Health	3.0
CHEM 242	Organic Chemistry II	4.0
EDUC 315	Secondary Science Teaching Methods	3.0
English Literature Elective 200-379		3.0
	Term Credits	13.0
Term 9		
BIO 306	Biochemistry Laboratory	2.0
BIO 404	Structure and Function of Biomolecules	4.0
EDEX 366	Literacy and Content Skill Development 7-12	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0

ENVS 230	General Ecology	3.0
	Term Credits	18.0
Term 10		
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 409	Student Teaching Seminar I	9.0
	Term Credits	12.0
Term 11		
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 410 [WI]	Student Teaching	9.0
	Term Credits	12.0
Term 12		
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
ENVS 284	Physiological and Population Ecology	3.0
HIST 289	History of Science: Enlightenment to Modernity	4.0
PHIL 251	Ethics	3.0
PSY 320 [WI]	Educational Psychology	3.0
	Term Credits	17.0

Total Credit: 184.5

Education Faculty

Jennifer Adams, EdD *(Harvard University)*. Associate Professor. Comparative and international education; Poverty and education; Child welfare; Educational policy.

Ayana Allen, PhD *(Texas A&M University)*. Assistant Professor. Urban education; Identity construction in school contexts; Urban school transformation.

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Emeritus Faculty

Mary Jo Grdina, PhD *(Case Western Reserve University).* Clinical Professor. Undergraduate studies, science education, curriculum design.

Fredricka K. Reisman, PhD *(Syracuse University) Director of the Torrance Center for Creativity and Innovation.* Professor Emeritus. Mathematics education, learning mathematics, mathematics pedagogy, teacher education, heuristic diagnostic learning and teaching, theory and research in creativity and applied creativity.

Teacher Education: Chemistry

Major: Teacher Education
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 195.5
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 13.1205
Standard Occupational Classification (SOC) code: 25-2031

About the Concentration

Certification is for grades 7 - 12

This certification option within the BS in Teacher Education (p. 456) emphasizes coursework in such areas as organic chemistry, physical chemistry, biochemistry, analytical chemistry, and inorganic chemistry. Candidates may also choose to pursue a second certification in biology.

Additional Information

For more information about the program, visit the School of Education (http://www.drexel.edu/soe/) website.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
English elective course between 200-329		3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
MATH 200	Multivariate Calculus	4.0
PHIL 251	Ethics	3.0
PSY 320 [WI]	Educational Psychology	3.0
UNIV T101	The Drexel Experience	1.0

Science Requirements

BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
BIO 109	Biological Diversity, Ecology & Evolution	3.0
BIO 110	Biological Diversity, Ecology and Evolution Laboratory	1.0
BIO 306	Biochemistry Laboratory	2.0
CHEC 352	Physical Chemistry and Applications II	4.0
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
CHEM 103	General Chemistry III	5.0
CHEM 230	Quantitative Analysis	4.0
CHEM 231 [WI]	Quantitative Analysis Laboratory	2.0
CHEM 241	Organic Chemistry I	4.0
CHEM 242	Organic Chemistry II	4.0
CHEM 243	Organic Chemistry III	3.0
CHEM 244	Organic Chemistry Laboratory I	3.0
CHEM 245	Organic Chemistry Laboratory II	3.0
CHEM 253	Thermodynamics and Kinetics	4.0
CHEM 357 [WI]	Physical Chemistry Laboratory I	2.5
CHEM 420	Molecular Symmetry and Group Theory Applied Chemistry	3.0
CHEM 421	Inorganic Chemistry I	3.0
CHEM 430	Analytical Chemistry I	3.0
ENVS 401	Chemistry of the Environment	3.0
PHEV 145	Weather I: Climate and Global Change	4.0
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
PHYS 201	Fundamentals of Physics III	4.0

Pedagogy Requirements

EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDEX 366	Literacy and Content Skill Development 7-12	3.0
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar (To be taken 3 times)	3.0
EDUC 113	Organizational Structure of Secondary Schools	3.0
EDUC 123	Adolescent Development	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 223	Teaching the Middle School Child	3.0
EDUC 258	Reading in the Content Areas	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 315	Secondary Science Teaching Methods	3.0
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 322	Evaluation of Instruction	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
EDUC 405	Senior Pedagogy Seminar	1.0

Student Teaching Experiences

EDUC 409	Student Teaching Seminar I	9.0
EDUC 410 [WI]	Student Teaching (Chemistry)	9.0
Total Credits		**195.5**

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses

with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Chemistry Concentration: Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

4 YR UG Co-op Concentration

Term 1		Credits
CHEM 101	General Chemistry I	3.5
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121	Calculus I	4.0
UNIV T101	The Drexel Experience	1.0
	Term Credits	15.5
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
CHEM 102	General Chemistry II	4.5
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 113	Organizational Structure of Secondary Schools	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122	Calculus II	4.0
	Term Credits	16.5
Term 3		
CHEM 103	General Chemistry III	5.0
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 123	Adolescent Development	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 123	Calculus III	4.0
	Term Credits	19.0
Term 4		
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
CHEM 230	Quantitative Analysis	4.0
CHEM 231 [WI]	Quantitative Analysis Laboratory	2.0
CHEM 241	Organic Chemistry I	4.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
	Term Credits	18.0
Term 5		
BIO 109	Biological Diversity, Ecology & Evolution	3.0
BIO 110	Biological Diversity, Ecology and Evolution Laboratory	1.0
CHEM 242	Organic Chemistry II	4.0
CHEM 244	Organic Chemistry Laboratory I	3.0
COOP 101	Career Management and Professional Development	0.0
EDUC 223	Teaching the Middle School Child	3.0
EDUC 322	Evaluation of Instruction	3.0
	Term Credits	17.0
Term 6		
CHEM 243	Organic Chemistry III	3.0
CHEM 245	Organic Chemistry Laboratory II	3.0
EDUC 258	Reading in the Content Areas	3.0

EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
PHYS 101	Fundamentals of Physics I	4.0
	Term Credits	17.0
Term 7		
CHEM 420	Molecular Symmetry and Group Theory Applied Chemistry	3.0
CHEM 421	Inorganic Chemistry I	3.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
MATH 200	Multivariate Calculus	4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	17.0
Term 8		
CHEM 253	Thermodynamics and Kinetics	4.0
EDUC 315	Secondary Science Teaching Methods	3.0
PHEV 145	Weather I: Climate and Global Change	4.0
PHYS 201	Fundamentals of Physics III	4.0
PSY 320 [WI]	Educational Psychology	3.0
	Term Credits	18.0
Term 9		
BIO 306	Biochemistry Laboratory	2.0
CHEC 352	Physical Chemistry and Applications II	4.0
CHEM 357 [WI]	Physical Chemistry Laboratory I	2.5
EDEX 366	Literacy and Content Skill Development 7-12	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
	Term Credits	17.5
Term 10		
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 409	Student Teaching Seminar I	9.0
	Term Credits	12.0
Term 11		
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 410 [WI]	Student Teaching	9.0
	Term Credits	12.0
Term 12		
CHEM 430	Analytical Chemistry I	3.0
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
ENVS 401	Chemistry of the Environment	3.0
PHIL 251	Ethics	3.0
English (ENGL) course between 200-239		3.0
	Term Credits	16.0

Total Credit: 195.5

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Teacher Education: Earth and Space Science

Major: Teacher Education
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 186.5
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 13.1205
Standard Occupational Classification (SOC) code: 25-2031

About the Concentration

Certification is for grades 7 - 12

This option within the BS in Teacher Education (p. 456) emphasizes interdisciplinary study, involving coursework in biology, chemistry, geology, physics and atmospheric science. Candidates may also choose to pursue a second certification in chemistry or physics.

Additional Information

For more information about the program, visit the School of Education (http://www.drexel.edu/soe/) website.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	

ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
PHIL 251	Ethics	3.0
PSY 101	General Psychology I	3.0
PSY 320 [WI]	Educational Psychology	3.0
UNIV T101	The Drexel Experience	1.0
English elective course between 200-329		3.0
Science Requirements		
BIO 122	Cells and Genetics	4.5
BIO 124	Evolution & Organismal Diversity	4.5
BIO 126	Physiology and Ecology	4.5
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
ENVS 230	General Ecology	3.0
ENVS 260	Environmental Science and Society	3.0
ENVS 284	Physiological and Population Ecology	3.0
ENVS 285 [WI]	Population Ecology Laboratory	2.0
ENVS 286	Community and Ecosystem Ecology	3.0
ENVS 287	Community Ecology Laboratory	2.0
ENVS 330	Aquatic Ecology	3.0
ENVS 390	Marine Ecology	3.0
ENVS 441 [WI]	Issues in Global Change I: Seminar	2.0
GEO 101	Physical Geology	4.0
GEO 102	History of the Earth	4.0
PHEV 145	Weather I: Climate and Global Change	4.0
PHEV 146	Weather II: Analysis and Forecasting	4.0
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
PHYS 131	Survey of the Universe	3.0
Pedagogy Requirements		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDEX 366	Literacy and Content Skill Development 7-12	3.0
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar (To be taken 3 times)	3.0
EDUC 113	Organizational Structure of Secondary Schools	3.0
EDUC 123	Adolescent Development	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 223	Teaching the Middle School Child	3.0
EDUC 258	Reading in the Content Areas	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 315	Secondary Science Teaching Methods	3.0
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 322	Evaluation of Instruction	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
Student Teaching Experiences		
EDUC 409	Student Teaching Seminar I	9.0

EDUC 410 [WI]	Student Teaching	9.0
Total Credits		186.5

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Earth and Space Science Concentration: Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

4 YR UG Co-op Concentration

Term 1		Credits
BIO 122	Cells and Genetics	4.5
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121	Calculus I	4.0
UNIV T101	The Drexel Experience	1.0
	Term Credits	16.5
Term 2		
BIO 124	Evolution & Organismal Diversity	4.5
CIVC 101	Introduction to Civic Engagement	1.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 113	Organizational Structure of Secondary Schools	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122	Calculus II	4.0
	Term Credits	16.5
Term 3		
BIO 126	Physiology and Ecology	4.5
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 123	Adolescent Development	3.0

ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or 113	English Composition III	
PHEV 145	Weather I: Climate and Global Change	4.0
	Term Credits	18.5
Term 4		
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
ENVS 230	General Ecology	3.0
MATH 123	Calculus III	4.0
PHYS 101	Fundamentals of Physics I	4.0
PSY 101	General Psychology I	3.0
	Term Credits	18.0
Term 5		
COOP 101	Career Management and Professional Development	0.0
EDUC 223	Teaching the Middle School Child	3.0
EDUC 322	Evaluation of Instruction	3.0
GEO 102	History of the Earth	4.0
PHYS 102	Fundamentals of Physics II	4.0
English elective course between 200-329		3.0
	Term Credits	17.0
Term 6		
CHEM 101	General Chemistry I	3.5
EDUC 258	Reading in the Content Areas	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
ENVS 284	Physiological and Population Ecology	3.0
ENVS 286	Community and Ecosystem Ecology	3.0
	Term Credits	16.5
Term 7		
CHEM 102	General Chemistry II	4.5
EDUC 312	Educational Policy, Law & Advocacy	3.0
ENVS 285 [WI]	Population Ecology Laboratory	2.0
ENVS 441 [WI]	Issues in Global Change I: Seminar	2.0
GEO 101	Physical Geology	4.0
	Term Credits	15.5
Term 8		
EDUC 315	Secondary Science Teaching Methods	3.0
ENVS 260	Environmental Science and Society	3.0
PSY 320 [WI]	Educational Psychology	3.0
PHEV 146	Weather II: Analysis and Forecasting	4.0
	Term Credits	13.0
Term 9		
ECON 201	Principles of Microeconomics	4.0
EDEX 366	Literacy and Content Skill Development 7-12	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
ENVS 287	Community Ecology Laboratory	2.0
ENVS 390	Marine Ecology	3.0
	Term Credits	18.0
Term 10		
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 409	Student Teaching Seminar I	9.0
	Term Credits	12.0
Term 11		
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 410 [WI]	Student Teaching	9.0
	Term Credits	12.0
Term 12		
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
ENVS 330	Aquatic Ecology	3.0

PHIL 251	Ethics	3.0
PHYS 131	Survey of the Universe	3.0
	Term Credits	13.0

Total Credit: 186.5

Education Faculty

Jennifer Adams, EdD *(Harvard University)*. Associate Professor. Comparative and international education; Poverty and education; Child welfare; Educational policy.

Ayana Allen, PhD *(Texas A&M University)*. Assistant Professor. Urban education; Identity construction in school contexts; Urban school transformation.

Kristen Betts, EdD *(George Washington University)*. Clinical Professor. Higher education administration and governance, online blended education, instructional design and educational technology, program assessment and evaluation.

Eric Brewe, PhD *(Arizona State University)*. Associate Professor. Physics Education Research, introductory course reform, network analysis in learning, neuromechanisms of learning.

José Luis Chávez, EdD *(University of Southern California)*. Clinical Professor. Higher education leadership and administration.

Rebecca Clothey, PhD *(University of Pittsburgh)*. Associate Professor. Comparative and international education, education of ethnic and linguistic minorities, sociology of education.

James Connell, PhD *(Louisiana State University) Founding Clinical Core Director and Research Fellow, A.J. Drexel Autism Institute*. Associate Professor. Identifying the variables that influence adult behavior change in community settings; autism intervention; widespread dissemination of evidence-based interventions in school and community settings.

Kareem Edouard, PhD *(Stanford University)*. Assistant Professor. Educational technology; internet-based STEM learning; equity and inclusion in STEM education

Salvatore V. Falletta, EdD *(North Carolina State University)*. Clinical Professor. Human Resource intelligence (i.e., HR research and analytics practices); HRD assessment, measurement, and evaluation models and taxonomies; organizational diagnostic models; web-based employee and organizational survey methods, and computational modeling.

Alonzo M. Flowers, III, PhD *(Texas A&M University)*. Associate Professor. Education issues including academic identity development of men of color in STEM education, diversity in teaching & learning, research methods/ design, and college student development in higher education

Aroutis N. Foster, PhD *(Michigan State University)*. Associate Professor. Educational psychology and educational technology, especially the following: Motivation; Technological Pedagogical Content Knowledge (TPACK); Immersive Interactive Digital Environments (simulation, games, virtual realities.

Kathy Geller, PhD *(Fielding Graduate University)*. Associate Clinical Professor. Educational leadership and management.

Rajashi Ghosh, PhD *(University of Louisville, Kentucky) Department Chair for Policy, Organization & Leadership*. Associate Professor. Mentoring

and leader development, workplace Incivility, workplace learning and development.

John M. Gould, PhD *(University of Pittsburgh) Harrisburg EdD Educational Leadership & Change Program.* Clinical Professor. Change leadership, curriculum re-design, the impact of technology on learning.

Dominic F. Gullo, PhD *(Indiana University).* Professor. Studying the relative and long-range effects of early schooling experiences in prekindergarten and kindergarten on children's achievement and social adaptation to school routine.

H. Bernard Hall, PhD *(Temple University).* Assistant Professor. Hip-hop Pedagogy , English Education, Urban Teacher Education.

Penny Hammrich, PhD *(University of Minnesota) Dean.* Distinguished University Professor. Urban education; science education; genetics; gender equity; science knowledge for conceptual teaching; sport science.

Paul Harrington, PhD *(University of Massachusetts, Boston) Director, Center for Labor Markets and Policy.* Professor. Teen and young adult job access; economic outlook, college labor market; workforce development, planning, and development; vocational rehabilitation and job market transition.

Michael J. Haslip, PhD *(Old Dominion University).* Assistant Professor. Early childhood education, social and emotional learning, child guidance strategies, effects of public pre-school attendance.

Deanna Hill, JD, PhD *(University of Pittsburgh).* Associate Clinical Professor. Higher education, international education, education law, education policy

Erin Horvat, PhD *(University of California, Los Angeles) Senior Vice Provost for Faculty Affairs.* Professor. Urban education, access and equity, high school dropout, parent involvement/family involvement, community engagement in research.

Jennifer Katz-Buonincontro, PhD *(University of Oregon) Associate Dean of Research.* Associate Professor. Educational administration, leadership development, survey & instrument design.

Larry Keiser, PhD *(Drexel University).* Associate Clinical Professor. Education and corporate/business leaders' creativity and entrepreneurial mindsets; creative school/work environments; neuroscience of creativity; everyday creativity for teachers and educators.

Kristine Kelly, PhD *(University of Wisconsin, Madison).* Associate Clinical Professor. Sociology of gender and development; anthropology of policy; comparative and international education; qualitative research methods; Vietnam and Southeast Asia.

Cameron Kiosoglous, PhD *(Virginia Tech University) Program Director.* Assistant Clinical Professor. Coached on the USRowing National Team staff since 2002, including the 2004, 2008, 2012, and 2016 Olympic Games; coaching development; measuring coaching quality; self-insight and reflective practices; coaching leadership; conference presenter; published author.

Valerie Klein, PhD *(Amherst College).* Associate Clinical Professor. Mathematics learning and teaching; teacher's use of formative assessment in mathematics; creating opportunities for rich problem solving in the classroom; examining teachers growth and change; qualitative research methods.

Michael G. Kozak, Ed.D. *(Rowan University).* Assistant Clinical Professor. Leadership, STEAM, online and blended learning environments, systems thinking, experiential learning, K-12 education, and facilitating change

Amanda Lannie, PhD *(Syracuse University).* Assistant Clinical Professor. Applied behavior analysis and special education; School-based consultation; system-wide interventions as a mechanism for delivery supports to all students; Designing effective and efficient interventions for students with emotional/behavioral disorders.

Vera Lee, EdD *(University of Pennsylvania).* Assistant Clinical Professor. Practitioner Research in online courses to explore inservice/preservice teachers' emerging understandings about issues of diversity; the development of information/digital literacies of urban youth; English language learners.

Bruce Levine, JD *(New York University).* Associate Clinical Professor. Educational policy, school law, public-private partnerships, intersection of business and education.

Kristine Lewis-Grant, PhD *(Temple University).* Clinical Professor. Experiences of students of African descent at predominantly white colleges and universities, college access and college student development, youth civic engagement in urban school reform, qualitative research and evaluation.

William Lynch, PhD *(University of Maryland).* Professor. Curriculum and educational leadership, educational technology, distance learning policy development, higher and adult education.

Constance Lyttle, PhD, JD *(University of Pittsburgh, Duquesne University).* Clinical Professor. Legal rights of gifted and talented children and children with disabilities; inclusive education of exceptional children; special education mediation; special education IEP/IFSP facilitation; resolution session facilitation

Joy Phillips, PhD *(The University of Texas at Austin).* Associate Clinical Professor. Visionary leadership in theory and practice, school reform as innovative problem-setting, thinking qualitatively about school reform. thinking about school reform by drawing, Educational Leadership Program Assessment.

Joyce Pittman, PhD *(Iowa State University of Science and Technology).* Clinical Professor. Curriculum and instruction K-16; teaching English as a foreign language (TEFL); instructional design business education and administration; industrial and career technology; oral and written communication; research methodology; instructional and assistive technology assessment; online learning pedagogy

Kathleen Provinzano, PhD *(Marywood University).* Assistant Professor. Educational administration.

Lori Severino, EdD *(Neumann University).* Assistant Professor. Special education, differentiated instruction, reading, Wilson language, multi-sensory instruction, reading comprehension, assessment, adolescent literacy.

Jason Silverman, PhD *(Vanderbilt University).* Professor. Teaching and learning of advanced mathematical ideas (algebra and calculus); improving teachers' ability to orchestrate and sustain inquiry-based and discussion-based instruction; technology in mathematics education.

Joanne Sloand, EdD *(Duquesne University) Department Chair for Teaching, Learning & Curriculum.* Associate Clinical Professor. Special

Education Leadership, Trauma-informed care, Parent engagement in special education service delivery.

Brian Smith, PhD *(Northwestern University) Senior Associate Dean of Academic Affairs.* Professor. Design of computer-based learning environments, computer science education, human-computer interaction, creativity and innovation; design sciences; informal/everyday learning.

Toni A. Sondergeld, PhD *(University of Toledo).* Associate Professor. Cognitive and affective assessment development; program/grant evaluation; high stakes testing measurement; STEM education; urban education

Nancy Butler Songer, PhD *(University of California, Davis).* Distinguished Professor. STEM education, urban education, educational assistance

Bridget Sweeney Blakely, PhD *(Temple University).* Assistant Clinical Professor. Consultation; Positive Behavior Interventions and Supports (PBIS); Response to Intervention (RtI); Systems-level change; performance feedback

Mary Jean Tecce DeCarlo, EdD *(University of Pennsylvania).* Associate Clinical Professor. Early literacy development, learning differences, knowledge construction, urban education.

Sarah P. Ulrich, EdD *(Saint Joseph's University) Associate Dean of Teacher Education and Undergraduate Affairs.* Clinical Professor. Cross-cultural, language and academic development, school reform, teacher preparation, teacher retention, teacher residencies in urban contexts.

Sheila Vaidya, PhD *(Temple University).* Professor. Educational psychology, school psychology, research design.

Christina Vorndran, PhD *(Louisiana State University) Program Director, Applied Behavior Analysis and Special Education.* Clinical Professor. Designing effective and efficient community-based interventions, Severe behavior disorders, Functional behavior assessment

Christopher G. Wright, PhD *(Tufts University).* Assistant Professor. Engineering and science education, Urban education, elementary teacher education.

Emeritus Faculty

Mary Jo Grdina, PhD *(Case Western Reserve University).* Clinical Professor. Undergraduate studies, science education, curriculum design.

Fredricka K. Reisman, PhD *(Syracuse University) Director of the Torrance Center for Creativity and Innovation.* Professor Emeritus. Mathematics education, learning mathematics, mathematics pedagogy, teacher education, heuristic diagnostic learning and teaching, theory and research in creativity and applied creativity.

Teacher Education: English

Major: Teacher Education
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 183.0
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 13.1205
Standard Occupational Classification (SOC) code: 25-2031

About the Concentration

Certification is for grades 7 - 12

This certification option within the BS in Teacher Education (p. 456) emphasizes coursework in areas such as American and British Literature, young adult fiction, and techniques for effectively teaching reading and writing skills. Candidates may also choose to pursue a second certification in any of the other certification areas.

Additional Information

For more information about the program, visit the School of Education (http://www.drexel.edu/soe/) website.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements		
ARTH 101	History of Art I: Ancient to Medieval	3.0
CIVC 101	Introduction to Civic Engagement	1.0
COM 230	Techniques of Speaking	3.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
ENVS 260	Environmental Science and Society	3.0
Select one American History course:		4.0
HIST 201	United States History to 1815	
HIST 202	United States History, 1815-1900	
HIST 203	United States History since 1900	
INFO 101	Introduction to Computing and Security Technology	3.0
LING 101	Introduction to Linguistics	3.0
MATH 171	Introduction to Analysis A	3.0
MATH 172	Introduction to Analysis B	3.0
MATH 173	Introduction to Analysis C	3.0
or MATH 107	Probability and Statistics for Liberal Arts	
MUSC 130	Introduction to Music	3.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
PHYS 181	Astronomy	3.0
PSY 101	General Psychology I	3.0
PSY 320 [WI]	Educational Psychology	3.0
SOC 335	Sociology of Education	3.0
WRIT 225 [WI]	Creative Writing	3.0
WRIT 301 [WI]	Writing Poetry	3.0
UNIV T101	The Drexel Experience	1.0
Science Sequence		**8.0**
Select one of the following:		
CHEM 111	General Chemistry I	
CHEM 112	General Chemistry II	
or		
PHYS 103	General Physics I	
PHYS 104	General Physics II	
English Requirements (option to minor in English)		
ENGL 200 [WI]	Classical to Medieval Literature	3.0

ENGL 201	Renaissance to the Enlightenment	3.0
ENGL 204	Post-Colonial Literature	3.0
ENGL 205 [WI]	American Literature I	3.0
ENGL 206 [WI]	American Literature II	3.0
ENGL 211 [WI]	British Literature I	3.0
ENGL 212	British Literature II	3.0
ENGL 304	Young Adult Fiction	3.0
ENGL 325	Topics in World Literature	3.0
ENGL 335	Mythology	3.0
ENGL 355 [WI]	Women and Literature	3.0
Pedagogy Requirements		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDEX 366	Literacy and Content Skill Development 7-12	3.0
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar (To be taken 3 times)	3.0
EDUC 113	Organizational Structure of Secondary Schools	3.0
EDUC 123	Adolescent Development	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 223	Teaching the Middle School Child	3.0
EDUC 258	Reading in the Content Areas	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 322	Evaluation of Instruction	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 358	English Teaching Methods	3.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
Student Teaching Experiences		
EDUC 409	Student Teaching Seminar I	9.0
EDUC 410 [WI]	Student Teaching	9.0
Total Credits		183.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

English Concentration: Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

4 YR UG Co-op Concentration

Term 1		Credits
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
MATH 171	Introduction to Analysis A	3.0
PHYS 103 or CHEM 111	General Physics I / General Chemistry I	4.0
UNIV T101	The Drexel Experience	1.0
	Term Credits	15.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 113	Organizational Structure of Secondary Schools	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
MATH 172	Introduction to Analysis B	3.0
PHYS 104 or CHEM 112	General Physics II / General Chemistry II	4.0
	Term Credits	15.0
Term 3		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 123	Adolescent Development	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
MATH 173 or 107	Introduction to Analysis C / Probability and Statistics for Liberal Arts	3.0
PSY 101	General Psychology I	3.0
	Term Credits	16.0
Term 4		
COM 230	Techniques of Speaking	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
INFO 101	Introduction to Computing and Security Technology	3.0
LING 101	Introduction to Linguistics	3.0
Select one of the following:		4.0
HIST 201	United States History to 1815	
HIST 202	United States History, 1815-1900	
HIST 203	United States History since 1900	
	Term Credits	17.0
Term 5		
COOP 101	Career Management and Professional Development	0.0
EDUC 223	Teaching the Middle School Child	3.0
EDUC 322	Evaluation of Instruction	3.0
ENGL 201	Renaissance to the Enlightenment	3.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
WRIT 301 [WI]	Writing Poetry	3.0
	Term Credits	15.0
Term 6		
EDUC 258	Reading in the Content Areas	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0

EDUC 365	Foundations in Instructing English Language Learners	3.0
ENGL 200 [WI]	Classical to Medieval Literature	3.0
ENGL 204	Post-Colonial Literature	3.0
WRIT 225 [WI]	Creative Writing	3.0
	Term Credits	16.0
Term 7		
EDUC 312	Educational Policy, Law & Advocacy	3.0
ENGL 211 [WI]	British Literature I	3.0
ENGL 304	Young Adult Fiction	3.0
MUSC 130	Introduction to Music	3.0
PHYS 181	Astronomy	3.0
	Term Credits	15.0
Term 8		
ARTH 101	History of Art I: Ancient to Medieval	3.0
ECON 201	Principles of Microeconomics	4.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
ENGL 355 [WI]	Women and Literature	3.0
ENGL 335	Mythology	3.0
	Term Credits	16.0
Term 9		
EDEX 366	Literacy and Content Skill Development 7-12	3.0
EDUC 216	Diversity and Today's Teacher	3.0
ENGL 205 [WI]	American Literature I	3.0
ENGL 212	British Literature II	3.0
ENGL 325	Topics in World Literature	3.0
EDUC 358	English Teaching Methods	3.0
	Term Credits	18.0
Term 10		
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 409	Student Teaching Seminar I	9.0
	Term Credits	12.0
Term 11		
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 410 [WI]	Student Teaching	9.0
	Term Credits	12.0
Term 12		
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
ENGL 206 [WI]	American Literature II	3.0
ENVS 260	Environmental Science and Society	3.0
PSY 320 [WI]	Educational Psychology	3.0
SOC 335	Sociology of Education	3.0
	Term Credits	16.0

Total Credit: 183.0

Education Faculty

Jennifer Adams, EdD *(Harvard University)*. Associate Professor. Comparative and international education; Poverty and education; Child welfare; Educational policy.

Ayana Allen, PhD *(Texas A&M University)*. Assistant Professor. Urban education; Identity construction in school contexts; Urban school transformation.

Kristen Betts, EdD *(George Washington University)*. Clinical Professor. Higher education administration and governance, online blended education, instructional design and educational technology, program assessment and evaluation.

Eric Brewe, PhD *(Arizona State University)*. Associate Professor. Physics Education Research, introductory course reform, network analysis in learning, neuromechanisms of learning.

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Rebecca Clothey, PhD *(University of Pittsburgh)*. Associate Professor. Comparative and international education, education of ethnic and linguistic minorities, sociology of education.

James Connell, PhD *(Louisiana State University) Founding Clinical Core Director and Research Fellow, A.J. Drexel Autism Institute*. Associate Professor. Identifying the variables that influence adult behavior change in community settings; autism intervention; widespread dissemination of evidence-based interventions in school and community settings.

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Alonzo M. Flowers, III, PhD *(Texas A&M University)*. Associate Professor. Education issues including academic identity development of men of color in STEM education, diversity in teaching & learning, research methods/ design, and college student development in higher education

Aroutis N. Foster, PhD *(Michigan State University)*. Associate Professor. Educational psychology and educational technology, especially the following: Motivation; Technological Pedagogical Content Knowledge (TPACK); Immersive Interactive Digital Environments (simulation, games, virtual realities.

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Penny Hammrich, PhD *(University of Minnesota) Dean*. Distinguished University Professor. Urban education; science education; genetics; gender equity; science knowledge for conceptual teaching; sport science.

Paul Harrington, PhD *(University of Massachusetts, Boston) Director, Center for Labor Markets and Policy*. Professor. Teen and young adult job access; economic outlook, college labor market; workforce development,

planning, and development; vocational rehabilitation and job market transition.

Michael J. Haslip, PhD *(Old Dominion University)*. Assistant Professor. Early childhood education, social and emotional learning, child guidance strategies, effects of public pre-school attendance.

Deanna Hill, JD, PhD *(University of Pittsburgh)*. Associate Clinical Professor. Higher education, international education, education law, education policy

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Larry Keiser, PhD *(Drexel University)*. Associate Clinical Professor. Education and corporate/business leaders' creativity and entrepreneurial mindsets; creative school/work environments; neuroscience of creativity; everyday creativity for teachers and educators.

Kristine Kelly, PhD *(University of Wisconsin, Madison)*. Associate Clinical Professor. Sociology of gender and development; anthropology of policy; comparative and international education; qualitative research methods; Vietnam and Southeast Asia.

Cameron Kiosoglous, PhD *(Virginia Tech University) Program Director*. Assistant Clinical Professor. Coached on the USRowing National Team staff since 2002, including the 2004, 2008, 2012, and 2016 Olympic Games; coaching development; measuring coaching quality; self-insight and reflective practices; coaching leadership; conference presenter; published author.

Valerie Klein, PhD *(Amherst College)*. Associate Clinical Professor. Mathematics learning and teaching; teacher's use of formative assessment in mathematics; creating opportunities for rich problem solving in the classroom; examining teachers growth and change; qualitative research methods.

Michael G. Kozak, Ed.D. *(Rowan University)*. Assistant Clinical Professor. Leadership, STEAM, online and blended learning environments, systems thinking, experiential learning, K-12 education, and facilitating change

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Kristine Lewis-Grant, PhD *(Temple University)*. Clinical Professor. Experiences of students of African descent at predominantly white

colleges and universities, college access and college student development, youth civic engagement in urban school reform, qualitative research and evaluation.

William Lynch, PhD *(University of Maryland)*. Professor. Curriculum and educational leadership, educational technology, distance learning policy development, higher and adult education.

Constance Lyttle, PhD, JD *(University of Pittsburgh, Duquesne University)*. Clinical Professor. Legal rights of gifted and talented children and children with disabilities; inclusive education of exceptional children; special education mediation; special education IEP/IFSP facilitation; resolution session facilitation

Joy Phillips, PhD *(The University of Texas at Austin)*. Associate Clinical Professor. Visionary leadership in theory and practice, school reform as innovative problem-setting, thinking qualitatively about school reform. thinking about school reform by drawing, Educational Leadership Program Assessment.

Joyce Pittman, PhD *(Iowa State University of Science and Technology)*. Clinical Professor. Curriculum and instruction K-16; teaching English as a foreign language (TEFL); instructional design business education and administration; industrial and career technology; oral and written communication; research methodology; instructional and assistive technology assessment; online learning pedagogy

Kathleen Provinzano, PhD *(Marywood University)*. Assistant Professor. Educational administration.

Lori Severino, EdD *(Neumann University)*. Assistant Professor. Special education, differentiated instruction, reading, Wilson language, multi-sensory instruction, reading comprehension, assessment, adolescent literacy.

Jason Silverman, PhD *(Vanderbilt University)*. Professor. Teaching and learning of advanced mathematical ideas (algebra and calculus); improving teachers' ability to orchestrate and sustain inquiry-based and discussion-based instruction; technology in mathematics education.

Joanne Sloand, EdD *(Duquesne University) Department Chair for Teaching, Learning & Curriculum*. Associate Clinical Professor. Special Education Leadership, Trauma-informed care, Parent engagement in special education service delivery.

Brian Smith, PhD *(Northwestern University) Senior Associate Dean of Academic Affairs*. Professor. Design of computer-based learning environments, computer science education, human-computer interaction, creativity and innovation; design sciences; informal/everyday learning.

Toni A. Sondergeld, PhD *(University of Toledo)*. Associate Professor. Cognitive and affective assessment development; program/grant evaluation; high stakes testing measurement; STEM education; urban education

Nancy Butler Songer, PhD *(University of California, Davis)*. Distinguished Professor. STEM education, urban education, educational assistance

Bridget Sweeney Blakely, PhD *(Temple University)*. Assistant Clinical Professor. Consultation; Positive Behavior Interventions and Supports (PBIS); Response to Intervention (Rtl); Systems-level change; performance feedback

Mary Jean Tecce DeCarlo, EdD *(University of Pennsylvania)*. Associate Clinical Professor. Early literacy development, learning differences, knowledge construction, urban education.

Sarah P. Ulrich, EdD *(Saint Joseph's University) Associate Dean of Teacher Education and Undergraduate Affairs*. Clinical Professor. Cross-cultural, language and academic development, school reform, teacher preparation, teacher retention, teacher residencies in urban contexts.

Sheila Vaidya, PhD *(Temple University)*. Professor. Educational psychology, school psychology, research design.

Christina Vorndran, PhD *(Louisiana State University) Program Director, Applied Behavior Analysis and Special Education*. Clinical Professor. Designing effective and efficient community-based interventions, Severe behavior disorders, Functional behavior assessment

Christopher G. Wright, PhD *(Tufts University)*. Assistant Professor. Engineering and science education, Urban education, elementary teacher education.

Emeritus Faculty

Mary Jo Grdina, PhD *(Case Western Reserve University)*. Clinical Professor. Undergraduate studies, science education, curriculum design.

Fredricka K. Reisman, PhD *(Syracuse University) Director of the Torrance Center for Creativity and Innovation*. Professor Emeritus. Mathematics education, learning mathematics, mathematics pedagogy, teacher education, heuristic diagnostic learning and teaching, theory and research in creativity and applied creativity.

Teacher Education: General Science

Major: Teacher Education
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 181.0
Co-op Options:
Classification of Instructional Programs (CIP) code: 13.1205
Standard Occupational Classification (SOC) code: 25-2031

About the Concentration

Certification is for grades 7 - 12

This certification option within the BS in Teacher Education (p. 456) is a well-rounded program incorporating biology, chemistry, mathematics, and physics. Candidates may also choose to pursue a second certification in any of the other certification areas. A sample plan of study is available.

Additional Information

For more information about the program, visit the School of Education (http://www.drexel.edu/soe/) website.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
HIST 289	History of Science: Enlightenment to Modernity	4.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
PHIL 251	Ethics	3.0
PSY 101	General Psychology I	3.0
PSY 320 [WI]	Educational Psychology	3.0
UNIV T101	The Drexel Experience	1.0
Free Electives		6.0
English (ENGL) course between 200-329		3.0
Science Requirements		
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
BIO 109	Biological Diversity, Ecology & Evolution	3.0
BIO 110	Biological Diversity, Ecology and Evolution Laboratory	1.0
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
CHEM 103	General Chemistry III	5.0
ENVS 284	Physiological and Population Ecology	3.0
ENVS 285 [WI]	Population Ecology Laboratory	2.0
ENVS 286	Community and Ecosystem Ecology	3.0
ENVS 390	Marine Ecology	3.0
GEO 101	Physical Geology	4.0
GEO 102	History of the Earth	4.0
PHEV 145	Weather I: Climate and Global Change	4.0
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
PHYS 131	Survey of the Universe	3.0
Science, Technology and Human Affairs Elective (see program advisor)		6.0
Pedagogy Requirements		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDEX 366	Literacy and Content Skill Development 7-12	3.0
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar (To be taken 3 times)	3.0
EDUC 113	Organizational Structure of Secondary Schools	3.0
EDUC 123	Adolescent Development	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 223	Teaching the Middle School Child	3.0
EDUC 258	Reading in the Content Areas	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 315	Secondary Science Teaching Methods	3.0
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 322	Evaluation of Instruction	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
Student Teaching Experiences		

EDUC 409	Student Teaching Seminar I	9.0
EDUC 410 [WI]	Student Teaching	9.0
Total Credits		181.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

General Science Concentration: Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

4 YR UG Co-op Concentration

Term 1		Credits
CHEM 101	General Chemistry I	3.5
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121	Calculus I	4.0
UNIV T101	The Drexel Experience	1.0
	Term Credits	15.5
Term 2		
CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 113	Organizational Structure of Secondary Schools	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122	Calculus II	4.0
	Term Credits	16.5
Term 3		
CHEM 103	General Chemistry III	5.0
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 123	Adolescent Development	3.0

ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
	Term Credits	15.0
Term 4		
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
MATH 123	Calculus III	4.0
PHYS 101	Fundamentals of Physics I	4.0
	Term Credits	16.0
Term 5		
BIO 109	Biological Diversity, Ecology & Evolution	3.0
BIO 110	Biological Diversity, Ecology and Evolution Laboratory	1.0
COOP 101	Career Management and Professional Development	0.0
EDUC 223	Teaching the Middle School Child	3.0
EDUC 322	Evaluation of Instruction	3.0
GEO 102	History of the Earth	4.0
	Term Credits	14.0
Term 6		
EDUC 258	Reading in the Content Areas	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
ENVS 284	Physiological and Population Ecology	3.0
PHYS 102	Fundamentals of Physics II	4.0
PSY 101	General Psychology I	3.0
	Term Credits	17.0
Term 7		
EDUC 312	Educational Policy, Law & Advocacy	3.0
ENVS 285 [WI]	Population Ecology Laboratory	2.0
GEO 101	Physical Geology	4.0
PHYS 131	Survey of the Universe	3.0
Free Elective		3.0
	Term Credits	15.0
Term 8		
EDUC 315	Secondary Science Teaching Methods	3.0
ENVS 286	Community and Ecosystem Ecology	3.0
HIST 289	History of Science: Enlightenment to Modernity	4.0
PHEV 145	Weather I: Climate and Global Change	4.0
PSY 320 [WI]	Educational Psychology	3.0
	Term Credits	17.0
Term 9		
EDEX 366	Literacy and Content Skill Development 7-12	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
ENVS 390	Marine Ecology	3.0
Science, Technology and Human Affairs elective (See program advisor)		3.0
	Term Credits	15.0
Term 10		
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 409	Student Teaching Seminar I	9.0
	Term Credits	12.0
Term 11		
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 410 [WI]	Student Teaching	9.0
	Term Credits	12.0
Term 12		
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
PHIL 251	Ethics	3.0
English (ENGL) course between 200-329		3.0

Science, Technology and Human Affairs elective (See program advisor)	3.0
Free Electives	3.0
Term Credits	16.0

Total Credit: 181.0

Education Faculty

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Jason Silverman, PhD *(Vanderbilt University)*. Professor. Teaching and learning of advanced mathematical ideas (algebra and calculus); improving teachers' ability to orchestrate and sustain inquiry-based and discussion-based instruction; technology in mathematics education.

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Education Leadership, Trauma-informed care, Parent engagement in special education service delivery.

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Fredricka K. Reisman, PhD *(Syracuse University) Director of the Torrance Center for Creativity and Innovation*. Professor Emeritus. Mathematics education, learning mathematics, mathematics pedagogy, teacher education, heuristic diagnostic learning and teaching, theory and research in creativity and applied creativity.

Teacher Education: Mathematics

Major: Teacher Education
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 183.0
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 13.1205
Standard Occupational Classification (SOC) code: 25-2031

About the Concentration

Certification is for grades 7 - 12

This certification option within the BS in Teacher Education (p. 456) emphasizes coursework in such areas of mathematics as calculus, linear algebra, differential equations, probability and statistics, techniques of mathematical proof, and discrete mathematics. Candidates may also choose to pursue a second certification in physics or one of the other sciences.

Additional Information

For more information about the program, visit the School of Education (http://www.drexel.edu/soe/) website.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
English elective course between 200-329		3.0
HIST 289	History of Science: Enlightenment to Modernity	4.0
INFO 108	Foundations of Software	3.0
PHIL 251	Ethics	3.0
PSY 101	General Psychology I	3.0
PSY 320 [WI]	Educational Psychology	3.0
UNIV T101	The Drexel Experience	1.0
Mathematics Requirements		
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
MATH 200	Multivariate Calculus	4.0
MATH 201	Linear Algebra	4.0
MATH 205	Survey of Geometry	3.0
MATH 210	Differential Equations	4.0
MATH 220 [WI]	Introduction to Mathematical Reasoning	3.0
MATH 221	Discrete Mathematics	3.0
MATH 311	Probability and Statistics I	4.0
MATH 312	Probability and Statistics II	4.0
MATH 331	Abstract Algebra I	4.0
Science Requirements		
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
BIO 109	Biological Diversity, Ecology & Evolution	3.0
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
ENVS 260	Environmental Science and Society	3.0
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
Pedagogy Requirements		

EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDEX 366	Literacy and Content Skill Development 7-12	3.0
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar (To be taken 3 times)	3.0
EDUC 113	Organizational Structure of Secondary Schools	3.0
EDUC 123	Adolescent Development	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 223	Teaching the Middle School Child	3.0
EDUC 258	Reading in the Content Areas	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 322	Evaluation of Instruction	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
MTED 419	Teaching Secondary Mathematics	3.0
MTED 428	Cultural and Historical Significance of Mathematics	3.0
Student Teaching Experience		
EDUC 409	Student Teaching Seminar I	9.0
EDUC 410 [WI]	Student Teaching	9.0
Total Credits		183.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Mathematics Concentration: Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

4 YR UG Co-op Concentration

Term 1		Credits
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0

EDUC 105	Freshman Pedagogy Seminar	1.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121	Calculus I	4.0
PSY 101	General Psychology I	3.0
UNIV T101	The Drexel Experience	1.0
	Term Credits	15.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 113	Organizational Structure of Secondary Schools	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
INFO 108	Foundations of Software	3.0
MATH 122	Calculus II	4.0
	Term Credits	15.0
Term 3		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 123	Adolescent Development	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 123	Calculus III	4.0
	Term Credits	14.0
Term 4		
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
CHEM 101	General Chemistry I	3.5
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
MATH 200	Multivariate Calculus	4.0
	Term Credits	15.5
Term 5		
BIO 109	Biological Diversity, Ecology & Evolution	3.0
COOP 101	Career Management and Professional Development	0.0
EDUC 223	Teaching the Middle School Child	3.0
EDUC 322	Evaluation of Instruction	3.0
MATH 221	Discrete Mathematics	3.0
PSY 320 [WI]	Educational Psychology	3.0
	Term Credits	15.0
Term 6		
EDUC 258	Reading in the Content Areas	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
MATH 210	Differential Equations	4.0
MATH 311	Probability and Statistics I	4.0
PHYS 101	Fundamentals of Physics I	4.0
	Term Credits	19.0
Term 7		
EDUC 312	Educational Policy, Law & Advocacy	3.0
MATH 220 [WI]	Introduction to Mathematical Reasoning	3.0
MTED 428	Cultural and Historical Significance of Mathematics	3.0
MATH 312	Probability and Statistics II	4.0
PHYS 102	Fundamentals of Physics II	4.0
	Term Credits	17.0
Term 8		
CHEM 102	General Chemistry II	4.5
ECON 201	Principles of Microeconomics	4.0
MATH 331	Abstract Algebra I	4.0
MTED 419	Teaching Secondary Mathematics	3.0
	Term Credits	15.5
Term 9		
EDEX 366	Literacy and Content Skill Development 7-12	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
MATH 201	Linear Algebra	4.0
MATH 205	Survey of Geometry	3.0
	Term Credits	16.0
Term 10		
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 409	Student Teaching Seminar I	9.0
	Term Credits	12.0
Term 11		
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 410 [WI]	Student Teaching	9.0
	Term Credits	12.0
Term 12		
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
ENVS 260	Environmental Science and Society	3.0
HIST 289	History of Science: Enlightenment to Modernity	4.0
PHIL 251	Ethics	3.0
English (ENGL) course between 200-329		3.0
	Term Credits	17.0

Total Credit: 183.0

Education Faculty

Jennifer Adams, EdD *(Harvard University)*. Associate Professor. Comparative and international education; Poverty and education; Child welfare; Educational policy.

Ayana Allen, PhD *(Texas A&M University)*. Assistant Professor. Urban education; Identity construction in school contexts; Urban school transformation.

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Salvatore V. Falletta, EdD *(North Carolina State University)*. Clinical Professor. Human Resource intelligence (i.e., HR research and analytics practices); HRD assessment, measurement, and evaluation models and

taxonomies; organizational diagnostic models; web-based employee and organizational survey methods, and computational modeling.

Alonzo M. Flowers, III, PhD *(Texas A&M University)*. Associate Professor. Education issues including academic identity development of men of color in STEM education, diversity in teaching & learning, research methods/design, and college student development in higher education

Aroutis N. Foster, PhD *(Michigan State University)*. Associate Professor. Educational psychology and educational technology, especially the following: Motivation; Technological Pedagogical Content Knowledge (TPACK); Immersive Interactive Digital Environments (simulation, games, virtual realities.

Kathy Geller, PhD *(Fielding Graduate University)*. Associate Clinical Professor. Educational leadership and management.

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Penny Hammrich, PhD *(University of Minnesota) Dean*. Distinguished University Professor. Urban education; science education; genetics; gender equity; science knowledge for conceptual teaching; sport science.

Paul Harrington, PhD *(University of Massachusetts, Boston) Director, Center for Labor Markets and Policy*. Professor. Teen and young adult job access; economic outlook, college labor market; workforce development, planning, and development; vocational rehabilitation and job market transition.

Michael J. Haslip, PhD *(Old Dominion University)*. Assistant Professor. Early childhood education, social and emotional learning, child guidance strategies, effects of public pre-school attendance.

Deanna Hill, JD, PhD *(University of Pittsburgh)*. Associate Clinical Professor. Higher education, international education, education law, education policy

Erin Horvat, PhD *(University of California, Los Angeles) Senior Vice Provost for Faculty Affairs*. Professor. Urban education, access and equity, high school dropout, parent involvement/family involvement, community engagement in research.

Jennifer Katz-Buonincontro, PhD *(University of Oregon) Associate Dean of Research*. Associate Professor. Educational administration, leadership development, survey & instrument design.

Larry Keiser, PhD *(Drexel University)*. Associate Clinical Professor. Education and corporate/business leaders' creativity and entrepreneurial mindsets; creative school/work environments; neuroscience of creativity; everyday creativity for teachers and educators.

Kristine Kelly, PhD *(University of Wisconsin, Madison)*. Associate Clinical Professor. Sociology of gender and development; anthropology of policy; comparative and international education; qualitative research methods; Vietnam and Southeast Asia.

Cameron Kiosoglous, PhD *(Virginia Tech University) Program Director*. Assistant Clinical Professor. Coached on the USRowing National Team staff since 2002, including the 2004, 2008, 2012, and 2016 Olympic Games; coaching development; measuring coaching quality; self-insight and reflective practices; coaching leadership; conference presenter; published author.

Valerie Klein, PhD *(Amherst College)*. Associate Clinical Professor. Mathematics learning and teaching; teacher's use of formative assessment in mathematics; creating opportunities for rich problem solving in the classroom; examining teachers growth and change; qualitative research methods.

Michael G. Kozak, Ed.D. *(Rowan University)*. Assistant Clinical Professor. Leadership, STEAM, online and blended learning environments, systems thinking, experiential learning, K-12 education, and facilitating change

Amanda Lannie, PhD *(Syracuse University)*. Assistant Clinical Professor. Applied behavior analysis and special education; School-based consultation; system-wide interventions as a mechanism for delivery supports to all students; Designing effective and efficient interventions for students with emotional/behavioral disorders.

Vera Lee, EdD *(University of Pennsylvania)*. Assistant Clinical Professor. Practitioner Research in online courses to explore inservice/preservice teachers' emerging understandings about issues of diversity; the development of information/digital literacies of urban youth; English language learners.

Bruce Levine, JD *(New York University)*. Associate Clinical Professor. Educational policy, school law, public-private partnerships, intersection of business and education.

Kristine Lewis-Grant, PhD *(Temple University)*. Clinical Professor. Experiences of students of African descent at predominantly white colleges and universities, college access and college student development, youth civic engagement in urban school reform, qualitative research and evaluation.

William Lynch, PhD *(University of Maryland)*. Professor. Curriculum and educational leadership, educational technology, distance learning policy development, higher and adult education.

Constance Lyttle, PhD, JD *(University of Pittsburgh, Duquesne University)*. Clinical Professor. Legal rights of gifted and talented children and children with disabilities; inclusive education of exceptional children; special education mediation; special education IEP/IFSP facilitation; resolution session facilitation

Joy Phillips, PhD *(The University of Texas at Austin)*. Associate Clinical Professor. Visionary leadership in theory and practice, school reform as innovative problem-setting, thinking qualitatively about school reform. thinking about school reform by drawing, Educational Leadership Program Assessment.

Joyce Pittman, PhD *(Iowa State University of Science and Technology)*. Clinical Professor. Curriculum and instruction K-16; teaching English as a foreign language (TEFL); instructional design business education and administration; industrial and career technology; oral and written

communication; research methodology; instructional and assistive technology assessment; online learning pedagogy

Kathleen Provinzano, PhD *(Marywood University)*. Assistant Professor. Educational administration.

Lori Severino, EdD *(Neumann University)*. Assistant Professor. Special education, differentiated instruction, reading, Wilson language, multi-sensory instruction, reading comprehension, assessment, adolescent literacy.

Jason Silverman, PhD *(Vanderbilt University)*. Professor. Teaching and learning of advanced mathematical ideas (algebra and calculus); improving teachers' ability to orchestrate and sustain inquiry-based and discussion-based instruction; technology in mathematics education.

Joanne Sloand, EdD *(Duquesne University) Department Chair for Teaching, Learning & Curriculum*. Associate Clinical Professor. Special Education Leadership, Trauma-informed care, Parent engagement in special education service delivery.

Brian Smith, PhD *(Northwestern University) Senior Associate Dean of Academic Affairs*. Professor. Design of computer-based learning environments, computer science education, human-computer interaction, creativity and innovation; design sciences; informal/everyday learning.

Toni A. Sondergeld, PhD *(University of Toledo)*. Associate Professor. Cognitive and affective assessment development; program/grant evaluation; high stakes testing measurement; STEM education; urban education

Nancy Butler Songer, PhD *(University of California, Davis)*. Distinguished Professor. STEM education, urban education, educational assistance

Bridget Sweeney Blakely, PhD *(Temple University)*. Assistant Clinical Professor. Consultation; Positive Behavior Interventions and Supports (PBIS); Response to Intervention (Rtl); Systems-level change; performance feedback

Mary Jean Tecce DeCarlo, EdD *(University of Pennsylvania)*. Associate Clinical Professor. Early literacy development, learning differences, knowledge construction, urban education.

Sarah P. Ulrich, EdD *(Saint Joseph's University) Associate Dean of Teacher Education and Undergraduate Affairs*. Clinical Professor. Cross-cultural, language and academic development, school reform, teacher preparation, teacher retention, teacher residencies in urban contexts.

Sheila Vaidya, PhD *(Temple University)*. Professor. Educational psychology, school psychology, research design.

Christina Vorndran, PhD *(Louisiana State University) Program Director, Applied Behavior Analysis and Special Education*. Clinical Professor. Designing effective and efficient community-based interventions, Severe behavior disorders, Functional behavior assessment

Christopher G. Wright, PhD *(Tufts University)*. Assistant Professor. Engineering and science education, Urban education, elementary teacher education.

Emeritus Faculty

Mary Jo Grdina, PhD *(Case Western Reserve University)*. Clinical Professor. Undergraduate studies, science education, curriculum design.

Fredricka K. Reisman, PhD *(Syracuse University) Director of the Torrance Center for Creativity and Innovation*. Professor Emeritus. Mathematics education, learning mathematics, mathematics pedagogy, teacher education, heuristic diagnostic learning and teaching, theory and research in creativity and applied creativity.

Teacher Education: Physics

Major: Teacher Education
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 190.0
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 13.1205
Standard Occupational Classification (SOC) code: 25-2031

About the Concentration

Certification is for grades 7- 12

This certification option within the BS in Teacher Education (p. 456) emphasizes coursework in physics and atmospheric science, including such topics as classical mechanics, electromagnetic fields, quantum mechanics, and physics of high fidelity, and survey of the universe. Candidates may also choose to pursue a second certification in mathematics.

Additional Information

For more information about the program, visit the School of Education (http://drexel.edu/soe/) website.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
HIST 289	History of Science: Enlightenment to Modernity	4.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
MATH 200	Multivariate Calculus	4.0
MATH 201	Linear Algebra	4.0
MATH 210	Differential Equations	4.0
PHIL 251	Ethics	3.0
PSY 101	General Psychology I	3.0
PSY 320 [WI]	Educational Psychology	3.0
UNIV T101	The Drexel Experience	1.0
English elective course between 200-329		3.0
Science Requirements		
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
BIO 109	Biological Diversity, Ecology & Evolution	3.0

CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
ENVS 260	Environmental Science and Society	3.0
PHEV 145	Weather I: Climate and Global Change	4.0
PHYS 113	Contemporary Physics I	5.0
PHYS 114	Contemporary Physics II	5.0
PHYS 115	Contemporary Physics III	5.0
PHYS 131	Survey of the Universe	3.0
PHYS 201	Fundamentals of Physics III	4.0
PHYS 217	Thermodynamics	4.0
PHYS 311	Classical Mechanics I	4.0
PHYS 312	Classical Mechanics II	4.0
PHYS 321	Electromagnetic Fields I	4.0
PHYS 326	Quantum Mechanics I	4.0
Pedagogy Requirements		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDEX 366	Literacy and Content Skill Development 7-12	3.0
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar (To be taken 3 times)	3.0
EDUC 113	Organizational Structure of Secondary Schools	3.0
EDUC 123	Adolescent Development	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 223	Teaching the Middle School Child	3.0
EDUC 258	Reading in the Content Areas	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 315	Secondary Science Teaching Methods	3.0
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 322	Evaluation of Instruction	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
Student Teaching Experiences		
EDUC 409	Student Teaching Seminar I	9.0
EDUC 410 [WI]	Student Teaching	9.0
Total Credits		190.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses

with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Physics Concentration: Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

4Yr UG Co-op Concentration

Term 1		Credits
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 121	Calculus I	4.0
PHYS 113	Contemporary Physics I	5.0
UNIV T101	The Drexel Experience	1.0
	Term Credits	17.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 113	Organizational Structure of Secondary Schools	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 122	Calculus II	4.0
PHYS 114	Contemporary Physics II	5.0
	Term Credits	17.0
Term 3		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 123	Adolescent Development	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PHYS 115	Contemporary Physics III	5.0
	Term Credits	15.0
Term 4		
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
CHEM 101	General Chemistry I	3.5
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
MATH 123	Calculus III	4.0
	Term Credits	15.5
Term 5		
BIO 109	Biological Diversity, Ecology & Evolution	3.0
COOP 101	Career Management and Professional Development	0.0
EDUC 223	Teaching the Middle School Child	3.0
EDUC 322	Evaluation of Instruction	3.0
MATH 200	Multivariate Calculus	4.0
	Term Credits	13.0
Term 6		
EDUC 258	Reading in the Content Areas	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
MATH 201	Linear Algebra	4.0
PHYS 217	Thermodynamics	4.0
PHYS 311	Classical Mechanics I	4.0
	Term Credits	19.0

Term 7

CHEM 102	General Chemistry II	4.5
EDUC 312	Educational Policy, Law & Advocacy	3.0
MATH 210	Differential Equations	4.0
PHYS 131	Survey of the Universe	3.0
PHYS 312	Classical Mechanics II	4.0
	Term Credits	18.5

Term 8

EDUC 315	Secondary Science Teaching Methods	3.0
HIST 289	History of Science: Enlightenment to Modernity	4.0
PHEV 145	Weather I: Climate and Global Change	4.0
PHYS 201	Fundamentals of Physics III	4.0
PHYS 321	Electromagnetic Fields I	4.0
	Term Credits	19.0

Term 9

EDEX 366	Literacy and Content Skill Development 7-12	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
PSY 101	General Psychology I	3.0
English (ENGL) course between 200-329		3.0
	Term Credits	15.0

Term 10

EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 409	Student Teaching Seminar I	9.0
	Term Credits	12.0

Term 11

EDLT 325	Design for Learning with Digital Media	3.0
EDUC 410 [WI]	Student Teaching	9.0
	Term Credits	12.0

Term 12

EDUC 316	Teaching in Urban Contexts	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
ENVS 260	Environmental Science and Society	3.0
PHIL 251	Ethics	3.0
PSY 320 [WI]	Educational Psychology	3.0
PHYS 326	Quantum Mechanics I	4.0
	Term Credits	17.0

Total Credit: 190.0

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Paul Harrington, PhD *(University of Massachusetts, Boston) Director, Center for Labor Markets and Policy*. Professor. Teen and young adult job access; economic outlook, college labor market; workforce development, planning, and development; vocational rehabilitation and job market transition.

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Larry Keiser, PhD *(Drexel University).* Associate Clinical Professor. Education and corporate/business leaders' creativity and entrepreneurial mindsets; creative school/work environments; neuroscience of creativity; everyday creativity for teachers and educators.

Kristine Kelly, PhD *(University of Wisconsin, Madison).* Associate Clinical Professor. Sociology of gender and development; anthropology of policy; comparative and international education; qualitative research methods; Vietnam and Southeast Asia.

Cameron Kiosoglous, PhD *(Virginia Tech University) Program Director.* Assistant Clinical Professor. Coached on the USRowing National Team staff since 2002, including the 2004, 2008, 2012, and 2016 Olympic Games; coaching development; measuring coaching quality; self-insight and reflective practices; coaching leadership; conference presenter; published author.

Valerie Klein, PhD *(Amherst College).* Associate Clinical Professor. Mathematics learning and teaching; teacher's use of formative assessment in mathematics; creating opportunities for rich problem solving in the classroom; examining teachers growth and change; qualitative research methods.

Michael G. Kozak, Ed.D. *(Rowan University).* Assistant Clinical Professor. Leadership, STEAM, online and blended learning environments, systems thinking, experiential learning, K-12 education, and facilitating change

Amanda Lannie, PhD *(Syracuse University).* Assistant Clinical Professor. Applied behavior analysis and special education; School-based consultation; system-wide interventions as a mechanism for delivery supports to all students; Designing effective and efficient interventions for students with emotional/behavioral disorders.

Vera Lee, EdD *(University of Pennsylvania).* Assistant Clinical Professor. Practitioner Research in online courses to explore inservice/preservice teachers' emerging understandings about issues of diversity; the development of information/digital literacies of urban youth; English language learners.

Bruce Levine, JD *(New York University).* Associate Clinical Professor. Educational policy, school law, public-private partnerships, intersection of business and education.

Kristine Lewis-Grant, PhD *(Temple University).* Clinical Professor. Experiences of students of African descent at predominantly white colleges and universities, college access and college student development, youth civic engagement in urban school reform, qualitative research and evaluation.

William Lynch, PhD *(University of Maryland).* Professor. Curriculum and educational leadership, educational technology, distance learning policy development, higher and adult education.

Constance Lyttle, PhD, JD *(University of Pittsburgh, Duquesne University).* Clinical Professor. Legal rights of gifted and talented children and children with disabilities; inclusive education of exceptional children; special education mediation; special education IEP/IFSP facilitation; resolution session facilitation

Joy Phillips, PhD *(The University of Texas at Austin).* Associate Clinical Professor. Visionary leadership in theory and practice, school reform as innovative problem-setting, thinking qualitatively about school reform. thinking about school reform by drawing, Educational Leadership Program Assessment.

Joyce Pittman, PhD *(Iowa State University of Science and Technology).* Clinical Professor. Curriculum and instruction K-16; teaching English as a foreign language (TEFL); instructional design business education and administration; industrial and career technology; oral and written communication; research methodology; instructional and assistive technology assessment; online learning pedagogy

Kathleen Provinzano, PhD *(Marywood University).* Assistant Professor. Educational administration.

Lori Severino, EdD *(Neumann University).* Assistant Professor. Special education, differentiated instruction, reading, Wilson language, multi-sensory instruction, reading comprehension, assessment, adolescent literacy.

Jason Silverman, PhD *(Vanderbilt University).* Professor. Teaching and learning of advanced mathematical ideas (algebra and calculus); improving teachers' ability to orchestrate and sustain inquiry-based and discussion-based instruction; technology in mathematics education.

Joanne Sloand, EdD *(Duquesne University) Department Chair for Teaching, Learning & Curriculum.* Associate Clinical Professor. Special Education Leadership, Trauma-informed care, Parent engagement in special education service delivery.

Brian Smith, PhD *(Northwestern University) Senior Associate Dean of Academic Affairs.* Professor. Design of computer-based learning environments, computer science education, human-computer interaction, creativity and innovation; design sciences; informal/everyday learning.

Toni A. Sondergeld, PhD *(University of Toledo).* Associate Professor. Cognitive and affective assessment development; program/grant evaluation; high stakes testing measurement; STEM education; urban education

Nancy Butler Songer, PhD *(University of California, Davis).* Distinguished Professor. STEM education, urban education, educational assistance

Bridget Sweeney Blakely, PhD *(Temple University).* Assistant Clinical Professor. Consultation; Positive Behavior Interventions and Supports (PBIS); Response to Intervention (Rtl); Systems-level change; performance feedback

Mary Jean Tecce DeCarlo, EdD *(University of Pennsylvania).* Associate Clinical Professor. Early literacy development, learning differences, knowledge construction, urban education.

Sarah P. Ulrich, EdD *(Saint Joseph's University) Associate Dean of Teacher Education and Undergraduate Affairs.* Clinical Professor. Cross-

cultural, language and academic development, school reform, teacher preparation, teacher retention, teacher residencies in urban contexts.

Sheila Vaidya, PhD *(Temple University)*. Professor. Educational psychology, school psychology, research design.

Christina Vorndran, PhD *(Louisiana State University) Program Director, Applied Behavior Analysis and Special Education*. Clinical Professor. Designing effective and efficient community-based interventions, Severe behavior disorders, Functional behavior assessment

Christopher G. Wright, PhD *(Tufts University)*. Assistant Professor. Engineering and science education, Urban education, elementary teacher education.

Emeritus Faculty

Mary Jo Grdina, PhD *(Case Western Reserve University)*. Clinical Professor. Undergraduate studies, science education, curriculum design.

Fredricka K. Reisman, PhD *(Syracuse University) Director of the Torrance Center for Creativity and Innovation*. Professor Emeritus. Mathematics education, learning mathematics, mathematics pedagogy, teacher education, heuristic diagnostic learning and teaching, theory and research in creativity and applied creativity.

Teacher Education: Social Studies

Major: Teacher Education
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 183
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 13.1205
Standard Occupational Classification (SOC) code: 25-2031

About the Concentration

Certification is for grades 7 - 12

This certification option within the BS in Teacher Education (p. 456) is designed to prepare candidates to teach social studies using appropriate pedagogy strategies. Topics include history, geography, civics, economics and psychology.

Additional Information

For more information about the program, visit the School of Education (https://drexel.edu/soe/) website.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education and Concentration Content Requirements		
ANTH 101	Introduction to Cultural Diversity	3.0
ANTH 110	Human Past: Anthropology and Prehistoric Archeology	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	

ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
ENGL 205 [WI]	American Literature I	3.0
Select two:		8.0
HIST 161	Themes in World Civilization I	
HIST 162	Themes in World Civilization II	
HIST 163	Themes in World Civilization III	
HIST 201	United States History to 1815	4.0
HIST 202	United States History, 1815-1900	4.0
HIST 203	United States History since 1900	4.0
HIST 212	Themes in African-American History	4.0
HIST 214	United States Civil Rights Movement	4.0
HIST 275	History of Pennsylvania	3.0
MATH 171	Introduction to Analysis A	3.0
MATH 172	Introduction to Analysis B	3.0
MATH 173	Introduction to Analysis C	3.0
or MATH 107	Probability and Statistics for Liberal Arts	
PSCI 110	American Government	4.0
PSCI 140	Comparative Politics I	4.0
PSCI 150	International Politics	4.0
PSCI 220	Constitutional Law I	4.0
PSCI 240	Comparative Politics II	4.0
PSCI 375	Politics of Immigration	4.0
PSY 101	General Psychology I	3.0
PSY 320 [WI]	Educational Psychology	3.0
SOC 101	Introduction to Sociology	3.0
SOC 210	Race, Ethnicity and Social Inequality	4.0
SOC 335	Sociology of Education	3.0
UNIV T101	The Drexel Experience	1.0
Pedagogy Requirements		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDEX 366	Literacy and Content Skill Development 7-12	3.0
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar (To be taken 3 times)	3.0
EDUC 112	Integrative Instruction: Focus on World Geography	3.0
EDUC 113	Organizational Structure of Secondary Schools	3.0
EDUC 123	Adolescent Development	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 223	Teaching the Middle School Child	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 322	Evaluation of Instruction	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 356	Secondary Social Studies Methods	3.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
Student Teaching Experience		
EDUC 409	Student Teaching Seminar I	9.0
EDUC 410 [WI]	Student Teaching	9.0
Total Credits		183.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Social Studies Concentration: Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

4 YR UG Co-op Concentration

Term 1		Credits
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
HIST 161, 162, or 163	Themes in World Civilization I Themes in World Civilization II Themes in World Civilization III	4.0
MATH 171	Introduction to Analysis A	3.0
PSY 101	General Psychology I	3.0
UNIV T101	The Drexel Experience	1.0
	Term Credits	18.0
Term 2		
HIST 162, 161, or 163	Themes in World Civilization II Themes in World Civilization I Themes in World Civilization III	4.0
ANTH 101	Introduction to Cultural Diversity	3.0
CIVC 101	Introduction to Civic Engagement	1.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 123	Adolescent Development	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 172	Introduction to Analysis B	3.0
	Term Credits	18.0
Term 3		
ANTH 110	Human Past: Anthropology and Prehistoric Archeology	3.0
COOP 101	Career Management and Professional Development	0.0
EDEX 142	Special Education Foundations: Referral and Assessment	3.0

EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 113	Organizational Structure of Secondary Schools	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 173 or 107	Introduction to Analysis C Probability and Statistics for Liberal Arts	3.0
	Term Credits	16.0
Term 4		
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 223	Teaching the Middle School Child	3.0
HIST 203	United States History since 1900	4.0
EDUC 365	Foundations in Instructing English Language Learners	3.0
	Term Credits	14.0
Term 5		
ENGL 205 [WI]	American Literature I	3.0
HIST 275	History of Pennsylvania	3.0
PSCI 110	American Government	4.0
PSCI 140	Comparative Politics I	4.0
SOC 210	Race, Ethnicity and Social Inequality	4.0
	Term Credits	18.0
Term 6		
ECON 201	Principles of Microeconomics	4.0
EDEX 366	Literacy and Content Skill Development 7-12	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 356	Secondary Social Studies Methods	3.0
	Term Credits	13.0
Term 7		
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 322	Evaluation of Instruction	3.0
HIST 201	United States History to 1815	4.0
PSCI 240	Comparative Politics II	4.0
	Term Credits	17.0
Term 8		
EDUC 112	Integrative Instruction: Focus on World Geography	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
PSCI 150	International Politics	4.0
SOC 101	Introduction to Sociology	3.0
SOC 335	Sociology of Education	3.0
	Term Credits	14.0
Term 9		
HIST 202	United States History, 1815-1900	4.0
PSCI 220	Constitutional Law I	4.0
PSCI 375	Politics of Immigration	4.0
PSY 320 [WI]	Educational Psychology	3.0
	Term Credits	15.0
Term 10		
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 409	Student Teaching Seminar I	9.0
	Term Credits	12.0
Term 11		
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 410 [WI]	Student Teaching	9.0
	Term Credits	12.0
Term 12		
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
ECON 202	Principles of Macroeconomics	4.0
HIST 212	Themes in African-American History	4.0

HIST 214	United States Civil Rights Movement	4.0
	Term Credits	16.0

Total Credit: 183.0

Education Faculty

Jennifer Adams, EdD *(Harvard University)*. Associate Professor. Comparative and international education; Poverty and education; Child welfare; Educational policy.

Ayana Allen, PhD *(Texas A&M University)*. Assistant Professor. Urban education; Identity construction in school contexts; Urban school transformation.

Kristen Betts, EdD *(George Washington University)*. Clinical Professor. Higher education administration and governance, online blended education, instructional design and educational technology, program assessment and evaluation.

Eric Brewe, PhD *(Arizona State University)*. Associate Professor. Physics Education Research, introductory course reform, network analysis in learning, neuromechanisms of learning.

José Luis Chávez, EdD *(University of Southern California)*. Clinical Professor. Higher education leadership and administration.

Rebecca Clothey, PhD *(University of Pittsburgh)*. Associate Professor. Comparative and international education, education of ethnic and linguistic minorities, sociology of education.

James Connell, PhD *(Louisiana State University) Founding Clinical Core Director and Research Fellow, A.J. Drexel Autism Institute*. Associate Professor. Identifying the variables that influence adult behavior change in community settings; autism intervention; widespread dissemination of evidence-based interventions in school and community settings.

Kareem Edouard, PhD *(Stanford University)*. Assistant Professor. Educational technology; internet-based STEM learning; equity and inclusion in STEM education

Salvatore V. Falletta, EdD *(North Carolina State University)*. Clinical Professor. Human Resource intelligence (i.e., HR research and analytics practices); HRD assessment, measurement, and evaluation models and taxonomies; organizational diagnostic models; web-based employee and organizational survey methods, and computational modeling.

Alonzo M. Flowers, III, PhD *(Texas A&M University)*. Associate Professor. Education issues including academic identity development of men of color in STEM education, diversity in teaching & learning, research methods/design, and college student development in higher education

Aroutis N. Foster, PhD *(Michigan State University)*. Associate Professor. Educational psychology and educational technology, especially the following: Motivation; Technological Pedagogical Content Knowledge (TPACK); Immersive Interactive Digital Environments (simulation, games, virtual realities.

Kathy Geller, PhD *(Fielding Graduate University)*. Associate Clinical Professor. Educational leadership and management.

Rajashi Ghosh, PhD *(University of Louisville, Kentucky) Department Chair for Policy, Organization & Leadership*. Associate Professor. Mentoring and leader development, workplace Incivility, workplace learning and development.

John M. Gould, PhD *(University of Pittsburgh) Harrisburg EdD Educational Leadership & Change Program*. Clinical Professor. Change leadership, curriculum re-design, the impact of technology on learning.

Dominic F. Gullo, PhD *(Indiana University)*. Professor. Studying the relative and long-range effects of early schooling experiences in prekindergarten and kindergarten on children's achievement and social adaptation to school routine.

H. Bernard Hall, PhD *(Temple University)*. Assistant Professor. Hip-hop Pedagogy , English Education, Urban Teacher Education.

Penny Hammrich, PhD *(University of Minnesota) Dean*. Distinguished University Professor. Urban education; science education; genetics; gender equity; science knowledge for conceptual teaching; sport science.

Paul Harrington, PhD *(University of Massachusetts, Boston) Director, Center for Labor Markets and Policy*. Professor. Teen and young adult job access; economic outlook, college labor market; workforce development, planning, and development; vocational rehabilitation and job market transition.

Michael J. Haslip, PhD *(Old Dominion University)*. Assistant Professor. Early childhood education, social and emotional learning, child guidance strategies, effects of public pre-school attendance.

Deanna Hill, JD, PhD *(University of Pittsburgh)*. Associate Clinical Professor. Higher education, international education, education law, education policy

Erin Horvat, PhD *(University of California, Los Angeles) Senior Vice Provost for Faculty Affairs*. Professor. Urban education, access and equity, high school dropout, parent involvement/family involvement, community engagement in research.

Jennifer Katz-Buonincontro, PhD *(University of Oregon) Associate Dean of Research*. Associate Professor. Educational administration, leadership development, survey & instrument design.

Larry Keiser, PhD *(Drexel University)*. Associate Clinical Professor. Education and corporate/business leaders' creativity and entrepreneurial mindsets; creative school/work environments; neuroscience of creativity; everyday creativity for teachers and educators.

Kristine Kelly, PhD *(University of Wisconsin, Madison)*. Associate Clinical Professor. Sociology of gender and development; anthropology of policy; comparative and international education; qualitative research methods; Vietnam and Southeast Asia.

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Bruce Levine, JD *(New York University)*. Associate Clinical Professor. Educational policy, school law, public-private partnerships, intersection of business and education.

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Constance Lyttle, PhD, JD *(University of Pittsburgh, Duquesne University)*. Clinical Professor. Legal rights of gifted and talented children and children with disabilities; inclusive education of exceptional children; special education mediation; special education IEP/IFSP facilitation; resolution session facilitation

Joy Phillips, PhD *(The University of Texas at Austin)*. Associate Clinical Professor. Visionary leadership in theory and practice, school reform as innovative problem-setting, thinking qualitatively about school reform. thinking about school reform by drawing, Educational Leadership Program Assessment.

Joyce Pittman, PhD *(Iowa State University of Science and Technology)*. Clinical Professor. Curriculum and instruction K-16; teaching English as a foreign language (TEFL); instructional design business education and administration; industrial and career technology; oral and written communication; research methodology; instructional and assistive technology assessment; online learning pedagogy

Kathleen Provinzano, PhD *(Marywood University)*. Assistant Professor. Educational administration.

Lori Severino, EdD *(Neumann University)*. Assistant Professor. Special education, differentiated instruction, reading, Wilson language, multi-sensory instruction, reading comprehension, assessment, adolescent literacy.

Jason Silverman, PhD *(Vanderbilt University)*. Professor. Teaching and learning of advanced mathematical ideas (algebra and calculus); improving teachers' ability to orchestrate and sustain inquiry-based and discussion-based instruction; technology in mathematics education.

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Brian Smith, PhD *(Northwestern University) Senior Associate Dean of Academic Affairs*. Professor. Design of computer-based learning environments, computer science education, human-computer interaction, creativity and innovation; design sciences; informal/everyday learning.

Toni A. Sondergeld, PhD *(University of Toledo)*. Associate Professor. Cognitive and affective assessment development; program/grant evaluation; high stakes testing measurement; STEM education; urban education

Nancy Butler Songer, PhD *(University of California, Davis)*. Distinguished Professor. STEM education, urban education, educational assistance

Bridget Sweeney Blakely, PhD *(Temple University)*. Assistant Clinical Professor. Consultation; Positive Behavior Interventions and Supports (PBIS); Response to Intervention (RtI); Systems-level change; performance feedback

Mary Jean Tecce DeCarlo, EdD *(University of Pennsylvania)*. Associate Clinical Professor. Early literacy development, learning differences, knowledge construction, urban education.

Sarah P. Ulrich, EdD *(Saint Joseph's University) Associate Dean of Teacher Education and Undergraduate Affairs*. Clinical Professor. Cross-cultural, language and academic development, school reform, teacher preparation, teacher retention, teacher residencies in urban contexts.

Sheila Vaidya, PhD *(Temple University)*. Professor. Educational psychology, school psychology, research design.

Christina Vorndran, PhD *(Louisiana State University) Program Director, Applied Behavior Analysis and Special Education*. Clinical Professor. Designing effective and efficient community-based interventions, Severe behavior disorders, Functional behavior assessment

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Mary Jo Grdina, PhD *(Case Western Reserve University)*. Clinical Professor. Undergraduate studies, science education, curriculum design.

Fredricka K. Reisman, PhD *(Syracuse University) Director of the Torrance Center for Creativity and Innovation*. Professor Emeritus. Mathematics education, learning mathematics, mathematics pedagogy, teacher education, heuristic diagnostic learning and teaching, theory and research in creativity and applied creativity.

Minor in Design of Learning Technologies

About the Minor

This minor offers a blended campus-based undergraduate-level, Education Minor in Design of Learning Technologies (DLT) with a thematic focus in Design and Technology. The Minor in DLT is designed to cultivate the knowledge and skills that students across multiple disciplines will need to design environments to support learning and teaching, typically new and emerging technologies.

The Minor will provide an option for students to gain a richer understanding of theories of learning for a wide range of educational contexts (e.g., classrooms, museums, after-school, summer camps, etc.), audiences (e.g., teachers, students, corporations, children, adults, etc.),

and learning environments (e.g. digital, non-digital, virtual, face-to-face, etc.). The minor program offers 24.0 core credits of instruction.

Admission Requirements

Student must have a 2.5 cumulative GPA or better.

Program Requirements

EDLT 103	Foundation in Education III: Learning Sciences	3.0
EDLT 238	New Media Literacies	3.0
EDLT 301	Learning, Culture & Technology Workshop III	3.0
EDLT 339	Future Pedagogies	3.0
EDLT 353	Play and Learning in Participatory Cultures	3.0
EDLT 354	Learning In and Out of Schools	3.0
INFO 110	Introduction to Human-Computer Interaction	3.0
INFO 310	Human-Centered Design Process & Methods	3.0
Total Credits		24.0

Minor in Education

About the Minor

The minor in education provides a structured academic opportunity for students who wish to add a fundamental understanding of the field of education as well as practical knowledge in the art and science of teaching and learning to their undergraduate experience.

Designed for students with a strong interest in education and training, the minor will not necessarily lead to the student being recommended for a state teaching certificate. However, should a student decide to also pursue a teaching certificate as a component of his or her major— or in post-baccalaureate work— the courses required for the minor are applicable to Pennsylvania State certification.

Program Requirements

Required Courses

EDEX 142	Special Education Foundations: Referral and Assessment	3.0
EDEX 246	Literacy and Content Skill Development PreK-8	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective	3.0
or EDUC 316	Teaching in Urban Contexts	
EDUC 120	Child Development I: Typical Development	3.0
or EDUC 123	Adolescent Development	
or EDUC 223	Teaching the Middle School Child	
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 322	Evaluation of Instruction	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
or EDUC 365	Foundations in Instructing English Language Learners	
EDUC 325	Multimedia in Instructional Design	3.0
or EDUC 308	Creating a Positive Classroom Climate	
Total Credits		24.0

Minor in Sport Coaching Leadership

About the Minor

The minor in Sport Coaching Leadership (SCL), open to all undergraduate students across the University, provides the foundation for the effective coaching and managing of athletes at various levels. The minor is complementary to a variety of degree programs.

Upon completion of the minor, students will have developed the ability to communicate and motivate athletes, enhance the social and emotional growth of athletes, develop sound physical training programs, use sport skills effectively, inform athletes about the principles of good nutrition, reduce injuries by managing roles better, effectively deal with equipment, facilities, scheduling and team logistics and understand the administrative facets of coaching.

Program Requirements

Required Core Courses

SCL 101	Principles of Coaching	3.0
SCL 102	Principles of Coaching II	3.0
SCL 203	Sports Conditioning	3.0
SCL 210	Prevention and Care of Athletic Injuries	3.0
SCL 495	Coaching Practicum I	3.0
or SCL 496	Coaching Practicum II	
SCL Minor Electives		
Select 9 credits from the following		9.0
PSY 245 [WI]	Sports Psychology	
SCL 201	Sport-Based Youth Development	
SCL 280	Kinesiology	
SCL 314	Sport Performance and Energy Systems	
SCL 315	Athletic Recruiting	
SCL 325	Athlete Leadership Development	
SCL 345	Evaluating Athletes and Teams	
SCL 401	Professional Coaching Portfolio	
SCL 419	Global Coaching Seminar	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in STEM Education

About the Minor

This minor can be coupled with a variety of STEM majors. It will provide an opportunity to explore STEM Education and to develop core knowledge and practices in secondary STEM Education. Successful STEM Education minor candidates may build upon the minor's course work which leads to recommendation for PA teaching certification as a

secondary teacher (grades 7-12) in one or more STEM content areas. Additional course work for teacher certification includes Student Teaching and required Special Education and English Language Learner courses (an additional 2 courses + student teaching).

Program Requirements

Introductory Courses

ESTM 201	DragonsTeach: Step 1	1.5
ESTM 210	DragonsTeach: Step 2	1.5
STEM Education Core Courses		
ESTM 301	Knowing and Learning in Mathematics and Science	3.0
ESTM 302	Classroom Interactions	3.0
ESTM 350	Project-Based Instruction	4.0
History of Science or Mathematics Course [*]		
ESTM 362	Perspectives in Science and Mathematics Education	3.0
or MTED 428	Cultural and Historical Significance of Mathematics	
or HIST 285	Technology in Historical Perspective	
STEM Research Methods [**]		
ESTM 364	Methods of Research and Inquiry in Science and Mathematics	3.0
Special Education or English Language Learner Elective		
EDEX 142	Special Education Foundations: Referral and Assessment	3.0
or EDEX 244	Inclusionary Practices for Exceptional Students	
or EDUC 365	Foundations in Instructing English Language Learners	
STEM Education Elective (selected in consultation with a School of Education academic advisor)		**3.0**
Total Credits		25.0

[*]   Specific course selected in consultation with a School of Education academic advisor and is dependent on student's aspirations for teacher certification.

[**] A Research/Methods/Design course from a student's home department may be substituted in consultation with a School of Education academic advisor.

NOTE: If pursuing PA teaching certification requirements beyond the STEM Minor, all three Special Education or English Language Learner Elective courses listed above must be taken as well as ESTM 410. In addition, students specifically pursuing secondary level Mathematics PA Teacher Certification must also complete ESTM T380: Functions and Modeling.

Certificate in Creativity and Innovation

Certificate Level: Undergraduate
Admission Requirements: High school diploma
Certificate Type: Certificate
Number of Credits to Completion: 18.0
Instructional Delivery: Campus
Calendar Type: Quarter
Expected Time to Completion: 2 years
Financial Aid Eligibility: Not aid eligible
Classification of Instructional Program (CIP) Code: 30.9999
Standard Occupational Classification (SOC) Code: 11-9199

About the Program

The undergraduate certificate in Creativity & Innovation (C&I) provides the fundamentals of creative problem-solving content and competencies indicative of creative leaders. The Certificate in C&I provides students with the content knowledge of what creativity is and is not, and the tools and skills to identify and enhance their creative strengths and abilities, while fostering their ability to apply creativity in their personal lives and in a leadership role within the workplace.

Students have the option of completing this undergraduate certificate as a stand-alone professional development credential or as a concentration within their baccalaureate degree.

Program Requirements

Requirements

Core Courses		
CRTV 301	Foundations in Creativity	3.0
CRTV 302	Tools and Techniques in Creativity	3.0
CRTV 303	Creativity in the Workplace	3.0
Electives		
Select three of the following:		9.0
EDLT 101	Learning, Culture & Technology Workshop I	
EDLT 238	New Media Literacies	
EDLT 353	Play and Learning in Participatory Cultures	
PRST 450	Creative Leadership for Professionals	
WRIT 220 [WI]	Creative Nonfiction Writing	
WRIT 225 [WI]	Creative Writing	
Total Credits		18.0

The Antoinette Westphal College of Media Arts & Design

The Antoinette Westphal College of Media Arts & Design curricula include general studies in liberal arts and science, and experiential learning in studio, lab, and classroom settings within the disciplines.

Mission Statement

The Antoinette Westphal College of Media Arts & Design (http://www.drexel.edu/westphal/) (The Westphal College) is a community of learning in the areas of media, design, fine arts, performing arts, and the management of creative enterprise that values experiential and immersive education. Students are encouraged to give form to ideas by learning to recognize invention and innovation in a rapidly changing world through creative, critical, and collaborative approaches. The Westphal College's diverse programs seek to foster innovation and leadership in progressively interconnected disciplines and areas of study.

The academic programs are rigorous, and provide the appropriate balance of a solid foundation with individual creative direction, cultural awareness, strong technical skills, and an understanding of management and professional practice. The College is committed to continual review of curricula, processes and outcomes to make those improvements and refinements necessary to further enrich our students' education, and to continue to foster independent thinkers, astute leaders, and creative problem solvers.

Majors

- Animation & Visual Effects (BS) (p. 494)
- Architecture (BArch) (p. 497)
- Art History (BA, BS) (p. 504)
- Dance (BS) (p. 509)
- Design & Merchandising (BS) (p. 512)
- Entertainment (p. 517) & (p. 517) Arts Management (BS) (p. 517)
- Fashion Design (BS) (p. 528)
- Film & Television (BS) (p. 532)
- Game Design & Production (BS) (p. 535)
- Graphic Design (BS) (p. 539)
- Interactive Digital Media (BS) (p. 541)
- Interior Design (BS) (p. 545)
- Music Industry (BS) (p.   )
- Photography (BS) (p. 554)
- Product Design (BS) (p. 556)
- Screenwriting & Playwriting (BS) (p. 558)
- Virtual Reality & Immersive Media (BS) (p. 562)
- Westphal Studies Program (BS) (p. 566)

Accelerated Degrees

- Digital Media BS/MS (p. 567)
- Design and Merchandising BS/MBA (p. 517)
- Entertainment & Arts Management BS/MBA (p. 527)
- *NEW:* Interior Design/Design Research BS/MS
- *NEW:* Interior Design/Urban Strategy BS/MS
- Music Industry BS/MBA (p. 551)

Minors

- Animation & Visual Effects (p. 573)
- Architecture (p. 574)
- Art History (p. 574)
- Dance (p. 575)
- Digital Media (p. 575)
- Entertainment & Arts Management (p. 576)
- Film Studies (p. 576)
- Fine Arts (p. 576)
- Graphic Design (p. 577)
- Interactive Digital Media (p. 577)
- Jazz and African-American Music (p. 578)
- Music (p. 578)
- Music Performance (p. 578)
- Music Theory and Composition (p. 579)
- Performing Arts (p. 579)
- Photography (p. 579)
- Playwriting (p. 579)
- Product Design (p. 580)
- Retail (p. 580)
- Screenwriting (p. 581)
- Somatics (p. 581)
- Sports Media Production (p. 582)
- Sustainability in the Built Environment (p. 582)
- Television Industry and Enterprise (p. 583)
- TV Production & Media Management (p. 583)
- Theatre (p. 584)
- Video Production (p. 584)
- Virtual Reality & Immersive Media (p. 585)

Certificates

- Dance Studies (p. 585)

Undergraduate Co-operative Education

Westphal College students spend a minimum of six months (two terms) applying classroom and studio skills in positions within their chosen professions. Often referred to as "The Ultimate Internship," a co-op is a valuable, direct way to learn about a career, work with other professionals, and gain skills and experience that set Drexel graduates apart from students who complete their professional education in more traditional academic settings.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Special Programs

The Westphal College offers a number of special programs including Study Abroad, Accelerated Dual Degree, Accelerated Summer Courses, Enrichment Programs and Dance for Professionals.

Study Abroad

Many students in the College participate in study abroad ranging from ten days to two terms.Some of the more popular programs are in: Australia, Rome, France, Korea, Germany, Prague, Japan and Cuba as well as Drexel in London and Fashion in London. Students interested in study abroad should consult with their Program Director, Academic Advisor and the Study Abroad Office, 215-895-1704.

Enrichment Programs

The Department of Architecture & Interiors runs summer study tours abroad to Rome and Paris as elective course offerings in history and theory. These programs focus the travel portion into three-week periods to accommodate student work commitments. The Department of Cinema & Television offers a summer term Westphal in Los Angeles program for Film & Television, Screenwriting & Playwriting and other Westphal majors. The Entertainment & Arts Management program offers a Study Abroad program at the Edinburgh Fringe Festival in Scotland.

Accelerated Dual Degree Programs

Dual degree programs enable academically qualified students to earn both a bachelor's and an advanced degree in five years.

The following Accelerated Degree Programs are available to qualified High School students entering their freshman year in the Westphal College:

- **BS Music Industry/MBA**: This program offers the highly motivated and musically focused student an opportunity to combine music theory and technology with the MBA degree. The program is available to qualified Music Industry majors.
- **BS Entertainment & Arts Management/MBA**: This program allows high-achieving students preparing for leadership roles in media companies and arts organizations the opportunity to earn their MBA degree. The program is available to qualified Entertainment & Arts management majors.
- **BS in Design & Merchandising/MBA**: This program combines study in the area of fashion retail merchandising with the MBA degree. The program is available to qualified Design and Merchandising majors.

The following Accelerated Degree Programs are available to qualified matriculated students in the Westphal College:

- **BS/MS in Digital Media Programs**: This program allows highly motivated students to complete both the BS (Animation & Visual Effects, Game Design & Production, Interactive Digital Media) and MS degrees in Digital Media programs in five years.
- **BS Interior Design/MS in Interior Architecture & Design**: This program combines the Interior Design undergraduate and the graduate Interior Architecture & Design degrees in an intensive five-year program that provides an opportunity for the student to focus on an area of specialization.
- **BS Dance/MS in Elementary Education**: This career focus, dance in education, prepares students for jobs as elementary school teachers (grades Pre-Kindergarten through 4) who may also serve as school dance specialists. Students choosing this option will earn a BS degree in Dance through the Department of Performing Arts and may elect to continue for a fifth year of study to earn an MS in the Teaching, Learning and Curriculum-Teacher Certification through the School of Education.
- **BS Entertainment & Arts Management/MS in Arts Administration & Museum Leadership**: While not an accelerated program, students

who complete the EAM program may also choose to pursue a graduate degree at Drexel in Arts Administration & Museum Leadership. Students who apply for the graduate Arts Administration & Museum Leadership program and graduate with a 3.5 GPA in the last two years of the EAM degree program are automatically accepted into the program.

Accelerated Summer Courses

With departmental permission, students may enroll in Visual Studies accelerated courses over the summer. These typically include courses in Accelerated Design I, II, III, Introductory Drawing and Figure Drawing I. These courses primarily are offered so that new undergraduate transfer students and pre-graduate students can complete their future programs in an economical time frame. Students with some experience in studio coursework may be eligible to take accelerated courses. A portfolio review is required to determine eligibility.

Dance Part Time Professionals

The Part Time Professional Option of the Dance Major is designed for professional dancers interested in pursuing a BS degree in Dance while continuing their performance careers, or at the conclusion of their performing careers. This program grants "professional life experience" credits and an extended period of time to fulfill the remaining required courses.

Ensembles
Choral Ensembles

University Chorus (MUSC 101/001) Dr. Steven Powell, Director
As auditioned, 60-voice group which performs concert choir literature, both a cappella and with instrumental accompaniment.

Chamber Singers (MUSC 102/001) Dr. Steven Powell, Director
A select group of 18 singers chosen by audition from the University Chorus. They perform secular music from the Renaissance period (Madrigals).

Vocal Jazz Ensemble (MUSC 103/001) Dr. Steven Powell, Director
A select group of 16 singers chosen by audition from the University Chorus. They perform "anything that swings," doing a variety of pieces from the 20's to the 10's with a three-piece back-up band.

All College Choir (MUSC 104/001) Scott Bacon, Director
A large un-auditioned choir that performs a varied repertoire including light classics, spirituals, and popular music.

Gospel Choir (MUSC 115/001) Rev. Greg Ross, Director
The Gospel Choir is a group of approximately 60 singers that is open to all Drexel Students. This ensemble performs contemporary gospel music with its own backup band.

Instrumental Ensembles

Concert Band (MUSC 105/001) Dr. Wesley Broadnax, Director
Students who are proficient on woodwind, brass, or percussion instruments may become members of this large instrumental ensemble by auditioning for the director. Membership is based on the student's ability and the instrumental needs of the ensemble.

The Basketball Pep Band (MUSC 116/001) Dr. Wesley Broadnax, Director
This band is made up of brass players, saxophone players, and trap drummers drawn from the membership of the Concert Band.

Jazz Orchestra (MUSC 107/001) Dr. George Starks, Director
Performs music which is associated with and/or inspired by acknowledged masters of the jazz tradition such as Duke Ellington, Count Basie, Charlie Parker, Dizzy Gillespie, Miles Davis, Charles Mingus, Thad Jones, and others.

The Jazztet (MUSC 108/001) Dr. George Starks, Director
This ensemble performs small group masterpieces such as literature associated with Art Blakey, Horace Silver, Clifford Brown, John Coltrane, and others.

University Orchestra (MUSC 109/001)
This is a full orchestra that performs concert repertoire of various periods from the 18th century to the present day. Wind, brass, and percussionists must be in the Concert Band in order to participate.

Fusion Band (MUSC 112/001) Lynn Riley, Director
A small combo utilizing a rhythm section and any varying combination of saxes and brass. The repertoire includes music of the styles of jazz, Latin, funk, and rock.

Percussion Ensemble (MUSC 113/001) Mark Beecher, Director
Students in this group will have the opportunity to play, improve and perform on many instruments of the percussion family including: snare drum, bass drum, xylophone, marimba, timpani- and even hands and feet.

Mediterranean Ensemble (MUSC 114/001) Bruce Kaminsky, Director
Students perform traditional music from Southeastern Europe, the Middle East and Northern Africa. All traditional and Western instruments are welcomed including oud, bouzouki and saz along with guitar, violin and sax. Percussionists can play Drexel's wide assortment of traditional drums including doumbek, riq and djimbe. Students will have the opportunity to perform 7/8 and 9/8 rhythms from Greece, 10/8 rhythms from Turkey, learn songs in Greek, Turkish, Arabic and Hebrew. The ensemble also has a dance component.

Guitar Ensemble II (MUSC 106/002) Greg Wright, Director
An auditioned group of approximately ten guitarists plus bass players and a drummer. Repertoire includes a side range of styles utilizing music reading ability and improvisation skills

Guitar Ensemble I (MUSC 106/001) Greg Wright, Director
An un-auditioned group of ten to fifteen guitarists who use repertoire to sharpen their musical and technical skills.

Keyboard Ensemble (MUSC 110) Wanda Canfield, Director
A group of twelve keyboardists who utilize acoustic and electronic pianos to play a variety of repertoire.

Rock Ensemble (MUSC 117) Lynn Riley, Director
A small combo of vocalists, guitarists, bassists, keyboardist, and drummers who perform repertoire ranging from classic rock to alternative.

Drexel University Dance Program

Dr. Miriam Giguere, Director, Dance Ensemble (DANC 131)
Elegant, exciting, sophisticated, sleek are all words commonly used to describe the Drexel Dance Ensemble. Performing ballet, jazz, tap and modern dance, the Drexel Dancers are both versatile and original.

The Drexel Dance Ensemble (DANC 131)
A professional caliber dance company presenting two fully-produced concerts in the Mandell Theater each year. Students participating in the 60 member ensemble are given the opportunity to explore their

artistry through working with professional choreographers, both faculty and guests artists, as well as a selection of student choreographers. The diversity of choreographic talent promises a show with dimension and unique perspectives on contemporary and classical dance forms. Entrance into this company is open to any dancers beyond their freshman year by audition twice yearly.

The FreshDance Ensemble (DANC 131)
Dance company open exclusively to freshmen at Drexel. The 30 dancers in the ensemble perform two fully produced concerts at the Mandell Theater each year. Works by both professional and student choreographers are performed in a variety of genres including ballet, modern, jazz and hip-hop. Entrance into the company is open twice yearly by audition.

The Youth Performance Exchange Touring Ensemble (DANC 131)
This 8-10 member dance troupe performs assembly style lecture demonstration programs introducing student K-8 to the art of dance. Students learn the program each fall and perform for 15-20 elementary and middle school each Friday morning in winter and spring terms. Open by audition each fall term.

Drexel University Theatre Program

Mr. Nick Anselmo, Director of Theatre Programs

Introduction to Theater Production Practicum (THTR 130)
An introduction to the tools, basic skills and safety procedures that students must know in order to work on Theater Program shows.

Theatre Performance Practicum (THTR 131)
Students perform in Mainstage productions in the URBN Annex Black Box Theater or the Mandell Theater. An audition is required to participate in this ensemble.

Theatre Production Practicum (THTR 132)
Students serve as the stage crew for all theatrical productions at the URBN Annex Black Box Theater or the Mandell Theater and build all the sets, costumes, hang lights and run sound for all the shows.

Theatre Management Practicum (THTR 133)
Students work as stage managers, production managers, and in administrative positions of Drexel's Co-op Theater Company.

Open Mic Management Practicum (THTR 134)
Students manage and run all aspects of The Late Night Series, a free weekly open mic that strives to both champion and nuture performing artists with Philadelphia and the Drexel community.

Theatre Performance Ensemble (THTR 141)
The Theatre Performance Ensemble focuses on a specific area of performance training, creation, and research to supplement the standard theatre curriculum in performance.

Director's Lab Practicum (THTR 142)
Practical experience in acting for the stage through participation in a student directed one-act play in conjunction with the Play Directing Class. An audition is required to participate in this ensemble.

Musical Theatre Cabaret (THTR 143)
Practical experience preparing a song for performance with an emphasis on applying acting techniques to the delivery, it concludes with a public Cabaret performance.

New Works Festival Performance Practicum (THTR 144)

Practical experience in acting and dramaturgy for the stage through participation, development, and performance of student written plays in conjunction with the Page-to-Stage class.

Students participate in all aspects of theatre performance and production, including; acting, directing, design, costumes, lighting, sets, sound, publicity, and box office.

Facilities

Designed to be an incubator for tomorrow's creative leaders, The URBN Center is the award-winning home for many of the programs in the Antoinette Westphal College of Media Arts & Design, providing students with rigorous, studio intensive instruction and the latest technological resources. Majors that share this space include Animation & Visual Effects, Architecture, Design & Merchandising, Entertainment & Arts Management, Fashion Design, Game Design & Production, Graphic Design, Interactive Digital Media, Interior Design, Music Industry and Product Design.

The URBN Center also provides a black box theater (http://drexel.edu/performingarts/about/facilities/URBN-center-black-box-theater/) for our performing arts, a 3,500 square foot Leonard Pearlstein Gallery (http://www.drexel.edu/pearlsteingallery/), a Motion Capture studio, a Hybrid Making Lab (http://drexel.edu/westphal/about/overview/making_spaces/HybridMakingLab/) featuring Universal Laser Cutters and 3D printing and prototyping, Shima Seki high-tech knitting machines, the Robert and Penny Fox (http://www.drexel.edu/foxcollection/) Historic Costume Collection (http://www.drexel.edu/foxcollection/), the Charles Evans Fashion Design Library, a multi-use screening & lecture room, and offices for the College's administrative functions.

The Academic Building is home to our Photography major and Department of Art & Art History. Within this facility, the Westphal College occupies a 10,000- square-foot photography lab, lighting studios, digital imaging labs (http://drexel.edu/westphal/about/overview/making_spaces/DarkroomFacility/), as well as six lecture/ laboratory spaces for our Visual Studies courses.

In University Crossings, a 25,000 square foot space houses offices for Film & Video, Screenwriting & Playwriting and Television faculty. Also in this building are two state-of-the-art digital editing facilities, a shooting studio with special effects capability, two screening rooms, a digital audio post production studio, several multi-media classrooms, and a well-stocked equipment room, featuring state of the art cameras ARRIFLEX (Arri) Alexa XT Plus and the Amira Premiere 4K.

MacAlister Hall serves students in the Westphal College with: digital audio labs and recording studios for Music Industry; The Mandell Theater (http://www.drexel.edu/performingarts/about/facilities/mandell-theater/), a 420-seat proscenium theater with scene shop and dressing rooms; the Ellen Forman Memorial Dance Studio (http://drexel.edu/performingarts/about/facilities/ellen-forman-dance-studio/); and a high-definition studio space for our college-operated television station, DUTV, which reaches over 400,000 households.

The Music Industry program has a state-of-the-art recording studio and other music production facilities in One Drexel Plaza. These newly opened facilities were designed by noted acoustician Walter Storyk. Additionally, the Music Industry program has six recording studios located in University Crossings and MacAlister Hall.

Animation and Visual Effects

Major: Animation and Visual Effects
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 186.0
Co-op Options: One Co-op (Four years); Three Co-op (Five years)
Classification of Instructional Programs (CIP) code: 10.0304
Standard Occupational Classification (SOC) code: 27-1014

About the Program

The Animation & Visual Effects major provides students with the artistic, technological, story-telling, and design skills necessary to succeed as 3D animators and visual effects artists in the highly competitive entertainment, design, and communications industries.

Animation and Visual Effects has grown beyond its traditional applications in the entertainment industry. Beyond film, television, and internet based programming, these production techniques are also widely used in medical research, engineering, virtual and augmented reality systems, immersive media, web content, the performing arts, interactive game systems, corporate communications, and higher education. The depth and complexity of this field necessitates a rigorous course of study.

To best prepare students for the demands of careers in these cutting-edge disciplines, the program provides a foundational understanding of design and technology with core courses in digital media, the option to choose between a six or eighteen month co-op plan, and a curriculum of rigorous coursework covering specialized aspects of digital animation, visual effects, and immersive media. Students will learn the underlying principles of animation, along with advanced, industry-standard software and hardware technologies. The entire creative pipeline, from storyboarding to modeling and animation to rendering and compositing, is covered in depth, allowing students to experience all aspects of a production.

Additional Information

To find out more about this major, visit the Westphal College's Animation & Visual Effects Major (http://www.drexel.edu/westphal/academics/undergraduate/ANIM/) web page.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

COM 230	Techniques of Speaking	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
PHYS 170	Electricity and Motion	3.0
PHYS 171	Computational Lab for Electricity and Motion	1.0
PHYS 175	Light and Sound	3.0

PHYS 176	Computational Lab for Light and Sound	1.0
UNIV A101	The Drexel Experience	2.0
Required Arts and Humanities-students elect a minimum of 9 credits		9.0
Required Social Science-students elect a minimum of 9.0 credits		9.0
Free electives		24.0
Art and Art History Requirements		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ARTH 103	History of Art III: Modern Art	3.0
ARTH 300 [WI]	History of Modern Design	3.0
VSST 108	Design I for Media	3.0
VSST 109	Design II for Media	3.0
VSST 110	Introductory Drawing	3.0
VSST 111	Figure Drawing I	3.0
VSST 210	Painting Basics	3.0
Media and Computer Science Requirements		
ANIM 231	Scripting for Animation and Visual Effects	3.0
CS 171	Computer Programming I	3.0
FMVD 206	Audio Production and Post	3.0
SCRP 270 [WI]	Screenwriting I	3.0
Digital Media Core Requirements		
ANIM 140	Computer Graphics Imagery I	3.0
ANIM 141	Computer Graphics Imagery II	3.0
ANIM 211	Animation I	3.0
DIGM 105	Overview of Digital Media	3.0
DIGM 350 [WI]	Digital Storytelling	3.0
DIGM 451 [WI]	Explorations in New Media	3.0
DIGM 475 [WI]	Seminar: The Future of Digital Media	3.0
DIGM 490	Digital Media Senior Project	9.0
DIGM 491	Digital Media Senior Project Studio	3.0
GMAP 260	Overview of Computer Gaming	3.0
IDM 100	Introduction to Web Development	3.0
Animation Requirements		
ANIM 100	Foundational Tools for Animation & VFX	3.0
ANIM 110	Digital Imaging for Animation & VFX	3.0
ANIM 155	Previsualization for Animated Production	3.0
ANIM 212	Animation II	3.0
ANIM 215	History of Animation	3.0
ANIM 220	Digital Compositing I	3.0
ANIM 221	Digital Compositing II	3.0
ANIM 247	Organic Modeling I	3.0
ANIM 250	Professional Practices for Animation & VFX	3.0
ANIM 314	Character Animation I	3.0
Animation Electives		
Select four of the following:		12.0
	ANIM 145	Realtime Visualization
	ANIM 248	Advanced Lighting
	ANIM 315	Character Animation II
	ANIM 347	Organic Modeling II
	ANIM 388	Spatial Data Capture
	ANIM 410	Advanced Compositing
	ANIM 411	Advanced Animation
	ANIM T180	Special Topics in Animation
	ANIM T280	Special Topics in Animation
	ANIM T380	Special Topics in Animation
	ANIM T480	Special Topics in Animation
	ANIM I199	Independent Study in Animation
	ANIM I299	Independent Study in Animation
	ANIM I399	Independent Study in Animation
	ANIM I499	Independent Study in Animation
	GMAP 345	Game Development Foundations

GMAP 367	Character Animation for Gaming	
Total Credits		186.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
ANIM 100	Foundational Tools for Animation & VFX	3.0
DIGM 105	Overview of Digital Media	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
PHYS 170	Electricity and Motion	3.0
PHYS 171	Computational Lab for Electricity and Motion	1.0
UNIV A101	The Drexel Experience	1.0
VSST 110	Introductory Drawing	3.0
	Term Credits	17.0
Term 2		
ANIM 110	Digital Imaging for Animation & VFX	3.0
ANIM 140	Computer Graphics Imagery I	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
VSST 108	Design I for Media	3.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	17.0
Term 3		
ANIM 141	Computer Graphics Imagery II	3.0
ANIM 220	Digital Compositing I	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 101	Introduction to Analysis I	4.0
VSST 109	Design II for Media	3.0
	Term Credits	17.0

Term 4

ANIM 155	Previsualization for Animated Production	3.0
ANIM 211	Animation I	3.0
CS 171	Computer Programming I	3.0
GMAP 260	Overview of Computer Gaming	3.0
VSST 210	Painting Basics	3.0
	Term Credits	15.0

Term 5

ANIM 212	Animation II	3.0
ANIM 215	History of Animation	3.0
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
IDM 100	Introduction to Web Development	3.0
VSST 111	Figure Drawing I	3.0
	Term Credits	15.0

Term 6

ANIM 221	Digital Compositing II	3.0
ANIM 247	Organic Modeling I	3.0
ARTH 103	History of Art III: Modern Art	3.0
SCRP 270 [WI]	Screenwriting I	3.0
Free Elective		3.0
	Term Credits	15.0

Term 7

ANIM 231	Scripting for Animation and Visual Effects	3.0
ANIM 250	Professional Practices for Animation & VFX	3.0
COM 230	Techniques of Speaking	3.0
COOP 101	Career Management and Professional Development	0.0
DIGM 350 [WI]	Digital Storytelling	3.0
FMVD 206	Audio Production and Post	3.0
	Term Credits	15.0

Term 8

ANIM 314	Character Animation I	3.0
ARTH 300 [WI]	History of Modern Design	3.0
Animation Elective [*]		3.0
Free elective		6.0
	Term Credits	15.0

Term 9

DIGM 451 [WI]	Explorations in New Media	3.0
Animation Elective [*]		3.0
Arts and Humanities elective		3.0
Social Science elective		3.0
Free Elective		3.0
	Term Credits	15.0

Term 10

DIGM 490	Digital Media Senior Project	3.0
DIGM 491	Digital Media Senior Project Studio	1.0
Animation Elective [*]		3.0
Free elective		3.0
Arts and Humanities elective		3.0
Social Science elective		3.0
	Term Credits	16.0

Term 11

DIGM 490	Digital Media Senior Project	3.0
DIGM 491	Digital Media Senior Project Studio	1.0
Animation Elective [*]		3.0
Social Science elective		3.0
Free electives		3.0
	Term Credits	13.0

Term 12

DIGM 475 [WI]	Seminar: The Future of Digital Media	3.0
DIGM 490	Digital Media Senior Project	3.0
DIGM 491	Digital Media Senior Project Studio	1.0

Arts and Humanities elective		3.0
Free electives		6.0
	Term Credits	16.0

Total Credit: 186.0

[*]   See degree requirements (p. 494).

Dual/Accelerated Degrees

The accelerated degree program enables academically qualified students to earn both their bachelor's degree and a master's degree in digital media — graduating sooner than they would in traditional programs.

Current Drexel animation and visual effects students may apply for the accelerated BS/MS degree through the Graduate College of Drexel University after completing 90.0 credits, but no more than 120.0 credits. Contact the Graduate College of Drexel University (http://www.drexel.edu/graduatecollege/) for further information.

Facilities

This major is based in the Westphal College's Digital Media Department, located in the Westphal College's URBN Center.

The central creative space for the department is the Animation Capture & Effects Lab (ACE-Lab), featuring a 1200-sq-ft open studio space dedicated to digital media production. The studio features include a 25-foot-by-17-foot green screen cyclorama, studio lighting and modifiers, HD/2k/4k camera systems, camera dolly, Vicon Vantage motion capture system, stereo-360 "VR Video" capture systems, room-scale VR tracking systems, and a full 360° Immersive Projection Dome among other resources.

Additional spaces surrounding the main studio include screening rooms, classrooms and computer labs featuring advanced graphics work stations, VR labs, research labs, meeting rooms and faculty offices.

Animation and Visual Effects Faculty

Milady S. Bridges, BA *(Rutgers University) Program Director, Animation and Visual Effects.* Assistant Teaching Professor. Animation and visual effects technical artist.

Paul Diefenbach, PhD *(University of Pennsylvania).* Associate Professor. Game development, real-time rendering.

Nick Jushchyshyn, MFA *(Academy of Art University) Program Director, VR & Immersive Media.* Associate Professor. Visual effects, digital media and animation.

Frank J. Lee, PhD *(Carnegie Mellon University).* Professor. Human-computer interaction; cognitive engineering and science; intelligent software agents for games and education.

Robert Lloyd, MFA *(Temple University) Program Director, Game Design & Production.* Associate Teaching Professor. Game development, themed entertainment and motion simulation.

David Mauriello, BA *(Lafayette College).* Assistant Professor. 3D modeling and animation.

Glen Muschio, PhD *(Temple University).* Associate Professor. Digital media, society, communication.

Emil Polyak, MDCArtDes *(University of New South Wales)*. Assistant Professor. Cross-disciplinary art and design

Stefan Rank, PhD *(Vienna University of Technology)*. Associate Professor. Artificial intelligence, game design and human-computer interaction.

Daniel Rose, BS *(Purdue University)*. Assistant Teaching Professor. AAA and freelance game developer and environmental artist

Jervis Thompson, BS *(Drexel University)*. Teaching Professor. Digital media, interactive multimedia.

Michael Wagner, PhD *(Vienna University of Technology) Program Director, Digital Media.* Associate Professor. Educational use of digital media and computer games.

Jichen Zhu, PhD *(Georgia Institute of Technology)*. Associate Professor. Developing humanistic and interpretive framework of computational technology, particularly artificial intelligence (AI), and constructing AI-based cultural artifacts; interactive storytelling, games and software studies.

Emeritus Faculty

Theo Artz, BFA *(Tyler School of Art, Temple University)*. Associate Professor. Digital media.

Architecture

Major: Architecture
Degree Awarded: Bachelor of Architecture Degree (BArch)
Calendar Type: Quarter
Total Credit Hours: 227.0
Co-op Options: None
Classification of Instructional Programs (CIP) code: 04.0201
Standard Occupational Classification (SOC) code: 17-1011

About the Program

The practice of architecture requires a unique skill set—creative thinking and aesthetic sensitivity balanced with technical knowledge, cultural understanding, and social responsibility. Critical thinking and communication skills are needed. Drexel's Bachelor of Architecture program encompasses foundation courses in the applied and social sciences, the humanities, and a wide range of professional architecture courses to prepare students for careers in architecture and related fields. At the heart of the curriculum are the design studios where students are challenged to apply their knowledge acquired from the above disciplines to consequential design problems.

Drexel's work/study program is an experiential-based learning model that complements and provides an alternative to traditional full-time academic architecture programs. The Drexel model provides a practical, high-quality education to those students who seek early exposure to daily architectural practice as well as an affordable alternative to students who could not otherwise be able to enter the profession.

At Drexel there are two paths to an accredited Bachelor of Architecture degree, serving two distinct populations: the 2+4 option and the part-time evening option.

The Architecture Program's advising guidelines (http://www.drexel.edu/westphal/undergraduate/ARCH/Curriculum/#c3) include scheduling guidelines, studio advancement requirements, and general studio policies.

Accreditation

In the United States, most registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (http://www.naab.org/) (NAAB), which is the sole agency authorized to accredit US professional degree programs in architecture, recognizes three types of degrees: the Bachelor of Architecture, the Master of Architecture, and the Doctor of Architecture. A program may be granted an eight-year, three-year, or two-year term of accreditation, depending on the extent of its conformance with established educational standards.

Doctor of Architecture and Master of Architecture programs may require a pre-professional undergraduate degree in architecture for admission. However, the pre-professional degree is not, by itself, recognized as an accredited degree.

Drexel University, Antoinette Westphal College of Media Arts & Design, Department of Architecture + Interiors offers the following NAAB-accredited degree program(s):

2+4 Option: 6 year program (2 years full-time, 4 years part-time)

Bachelor of Architecture
227.0 undergraduate quarter-term credits

Part-Time Evening Option: 7 year part-time program
Bachelor of Architecture
227.0 undergraduate quarter-term credits

Next accreditation visit for both tracks: 2026

About the 2+4 Option

The 2+4 option is an accelerated route designed for well-prepared students entering the major directly after graduating from high school. In this program, two years of full-time coursework address the basic principles of architectural design and satisfy fundamental University core requirements in the arts and sciences as well as those job-related skills that are needed for entry-level professional positions in architecture or related fields. A comprehensive review of performance will take place after each year to ensure that students are making sufficient progress in all areas. After successfully completing the minimum requirements of the full-time phase, students find full-time employment in the building industry, including architecture firms, while continuing their academic program part-time in the evening for four additional years.

About the Part-time Evening Program

The part-time evening option is one of only two part-time evening architectural programs in the United States, leading to an accredited Bachelor of Architecture degree. Designed for non-traditional and transfer students, this program offers all courses part-time in the evening, enabling students to work full-time. The evening program sequence is seven years, but transfer students with university-level design credits can reduce its length by meeting specific program requirements through transcript and portfolio review.

By combining work and study, all Drexel Architecture students may be able to simultaneously satisfy their required internship for licensure, now called the Architectural Experience Program (AXP) (https://www.ncarb.org/gain-axp-experience/) while completing their professional degree, thus qualifying for the registration exam on graduation in most jurisdictions.

Additional Information

For more information, visit the Architecture Program (http://www.drexel.edu/westphal/academics/undergraduate/ARCH/) website. For advising and transfer information please review the Architecture Program's curriculum (http://www.drexel.edu/westphal/academics/undergraduate/ARCH/Curriculum/) page.

The Integrated Path to Architectural Licensure (IPAL) Program

In August of 2015, Drexel was approved by the National Council of Architectural Registration Boards (NCARB) (http://www.ncarb.org/) for participation in the Integrated Path to Architectural Licensure (IPAL) (https://www.ncarb.org/become-architect/ipal/) Program. IPAL provides students the opportunity to achieve licensure upon graduation – an important innovation affording students the chance to jumpstart their careers through a curriculum of education, work experience and licensure examinations. Students follow either of the two options leading to the Bachelor of Architecture degree while preparing for and sitting for licensing exams during the summers following the third, fourth and fifth year of study. Drexel is part of a selective group of schools in the country to offer this opportunity, an initiative spearheaded by the National Council of Architectural Registration Boards (NCARB). Students seeking access to this track need permission from the Program Director and the IPAL Faculty Advisor.

Note: Architecture vs Architectural Engineering

Because Drexel University offers two programs with "architecture" in their titles, it is useful to point out the significant differences between them:

- **Architects** design buildings to meet people's spatial, organizational, and aesthetic needs; they also coordinate the building design process. All states, the District of Columbia, and three U.S. territories (Guam, Puerto Rico, and the U.S. Virgin Islands) require individuals to be licensed (registered) before they may call themselves architects or contract to provide architectural services. Many architecture school graduates work in the field even though they are not licensed or while they are in the process of becoming licensed. But they may not call themselves an architect.
  A licensed architect is required to take legal responsibility for all work. Licensure requirements usually include:

  - A professional degree in architecture;
  - A period of practical training or internship; and
  - Passage of all divisions of the Architect Registration Examination (ARE).

- **Architectural engineers** specialize in the design of engineering systems within buildings. Architectural engineers earn Bachelor of Science degrees and become professional engineers with the required experience and state examinations. Students whose interests are focused on the technological and engineering aspects of buildings should review Drexel's major in Architectural Engineering (p. 216) offered by the College of Engineering.

Degree Requirements (2 + 4 Option)

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
PHIL 317	Ethics and Design Professions	3.0
PHYS 182	Applied Physics I	3.0
PHYS 183	Applied Physics II	3.0
UNIV A101	The Drexel Experience	2.0
Arts and Humanties-students elect a minimum of 6 credits		6.0
Natural Science-students elect a minimum of 3 credits		3.0
Social Science-students elect a minimum of 9 credits		9.0
Free electives		30.0
Studios (must be taken in order)		
ARCH 181	Architecture Studio 1A	4.0
ARCH 182	Architecture Studio 1B	4.0
ARCH 183	Architecture Studio 1C	4.0
ARCH 281	Architecture Studio 2A	4.0
ARCH 282	Architecture Studio 2B	4.0
ARCH 283	Architecture Studio 2C	4.0
ARCH 381	Architecture Studio 3A	4.0
ARCH 382	Architecture Studio 3B	4.0
ARCH 383	Architecture Studio 3C	4.0
ARCH 481	Architecture Studio 4A	4.0
ARCH 482	Architecture Studio 4B	4.0
ARCH 483	Architecture Studio 4C	4.0
ARCH 487	Architecture Studio 5A	4.0
ARCH 488	Architecture Studio 5B	4.0
ARCH 489	Architecture Studio 5C	4.0
ARCH 493	Senior Project I	4.0
ARCH 494	Senior Project II	4.0
ARCH 495	Senior Project III	4.0
Required Professional Courses (2 + 4 Option)		
ARCH 141	Architecture and Society I	3.0
ARCH 142	Architecture and Society II	3.0
ARCH 143	Architecture and Society III	3.0
ARCH 144	Architecture and Society IV	3.0
ARCH 211	Architectural Representation I	2.0
ARCH 212	Architectural Representation II	2.0
ARCH 213	Architectural Representation III	2.0
ARCH 221	Materials & Methods I	1.5
ARCH 222	Materials & Methods II	1.5
ARCH 223	Materials & Methods III	1.5
ARCH 224	Architectural Representation IV	2.0
ARCH 225	Architectural Representation V	2.0
ARCH 226	Architectural Representation VI	2.0
ARCH 251	Structural Systems I	1.5
ARCH 252	Structural Systems II	1.5
ARCH 253	Structural Systems III	1.5
ARCH 291	Building Systems I	1.5
ARCH 292	Building Systems II	1.5
ARCH 293	Building Systems III	1.5
ARCH 324	Materials & Methods IV	1.5
ARCH 325	Materials & Methods V	1.5

ARCH 326	Materials & Methods VI	1.5
ARCH 335	Professional Practice I	3.0
ARCH 336	Professional Practice II	3.0
ARCH 354	Structural Systems IV	1.5
ARCH 355	Structural Systems V	1.5
ARCH 356	Structural Systems VI	1.5
ARCH 394	Building Systems IV	1.5
ARCH 395	Building Systems V	1.5
ARCH 396	Building Systems VI	1.5
ARCH 431 [WI]	Architectural Programming	3.0
History and Theory Electives		
Select three of the following:		9.0
ARCH 340	American Architecture & Urbanism	
ARCH 341 [WI]	Theories of Architecture I	
ARCH 342 [WI]	Theories of Architecture II	
ARCH 343	Theories of Architecture III	
ARCH 344 [WI]	History of Modern Architecture I	
ARCH 346 [WI]	History of Philadelphia Architecture	
ARCH 347 [WI]	Intensive Architectural Studies	
ARCH 348 [WI]	Studies in Vernacular Architecture	
ARCH 350	Contemporary Architecture	
ARCH 421 [WI]	Environmental Psychology and Design Theory	
ARCH 441	Urban Design Seminar	
ARCH T180	Special Topics in Architecture	
ARCH T280	Special Topics in Architecture	
ARCH T380	Special Topics in Architecture	
ARCH T480	Special Topics in Architecture	
Professional Electives		
Select three of the following:		9.0
ARCH 432	The Development Process	
ARCH 451	Advanced Drawing	
ARCH 455	Computer Applications in Architecture I	
ARCH 456	Computer Applications in Architecture II	
ARCH 463	Emerging Architectural Technology	
ARCH 464	Building Enclosure Design	
ARCH 465	Energy and Architecture	
ARCH T180	Special Topics in Architecture	
ARCH T280	Special Topics in Architecture	
ARCH T380	Special Topics in Architecture	
ARCH T480	Special Topics in Architecture	
An approved Construction Management (CMGT) course		
Total Credits		**227.0**

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study (2 + 4) Option

Freshman

Term 1		Credits
ARCH 141	Architecture and Society I	3.0
ARCH 181	Architecture Studio 1A	4.0
ARCH 211	Architectural Representation I	2.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	17.0
Term 2		
ARCH 142	Architecture and Society II	3.0
ARCH 182	Architecture Studio 1B	4.0
ARCH 212	Architectural Representation II	2.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	17.0
Term 3		
ARCH 143	Architecture and Society III	3.0
ARCH 183	Architecture Studio 1C	4.0
ARCH 213	Architectural Representation III	2.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PHYS 182	Applied Physics I	3.0
	Term Credits	16.0

Sophomore

Term 4		
ARCH 221	Materials & Methods I	1.5
ARCH 224	Architectural Representation IV	2.0
ARCH 251	Structural Systems I	1.5
ARCH 281	Architecture Studio 2A	4.0
Free elective		3.0
Arts & Humanities Elective		3.0
Social Science Elective		3.0
	Term Credits	18.0
Term 5		
ARCH 144	Architecture and Society IV	3.0
ARCH 222	Materials & Methods II	1.5

ARCH 225	Architectural Representation V	2.0
ARCH 252	Structural Systems II	1.5
ARCH 282	Architecture Studio 2B	4.0
Free elective		3.0
Humanities elective		3.0
	Term Credits	18.0

Term 6

ARCH 223	Materials & Methods III	1.5
ARCH 226	Architectural Representation VI	2.0
ARCH 253	Structural Systems III	1.5
ARCH 283	Architecture Studio 2C	4.0
PHYS 183	Applied Physics II	3.0
Natural Science Elective		3.0
Free Elective		3.0
	Term Credits	18.0

Third Year (Part-Time)

Term 7

ARCH 291	Building Systems I	1.5
ARCH 354	Structural Systems IV	1.5
ARCH 381	Architecture Studio 3A	4.0
History/Theory elective		3.0
	Term Credits	10.0

Term 8

ARCH 292	Building Systems II	1.5
ARCH 355	Structural Systems V	1.5
ARCH 382	Architecture Studio 3B	4.0
Free elective		3.0
	Term Credits	10.0

Term 9

ARCH 293	Building Systems III	1.5
ARCH 356	Structural Systems VI	1.5
ARCH 383	Architecture Studio 3C	4.0
Social Science elective		3.0
	Term Credits	10.0

Term 10

Summer Quarter

Social Science elective		3.0
Free electives		6.0
	Term Credits	9.0

Fourth Year (Part-Time)

Term 11

ARCH 324	Materials & Methods IV	1.5
ARCH 394	Building Systems IV	1.5

ARCH 481	Architecture Studio 4A	4.0
	Term Credits	7.0

Term 12

ARCH 325	Materials & Methods V	1.5
ARCH 395	Building Systems V	1.5
ARCH 482	Architecture Studio 4B	4.0
Free elective		3.0
	Term Credits	10.0

Term 13

ARCH 326	Materials & Methods VI	1.5
ARCH 396	Building Systems VI	1.5
ARCH 483	Architecture Studio 4C	4.0
	Term Credits	7.0

Term 14

Summer Quarter

ARCH 431 [WI]	Architectural Programming	3.0
History/Theory elective		3.0
Professional elective		3.0
	Term Credits	9.0

Fifth Year (Part-Time)

Term 15

ARCH 335	Professional Practice I	3.0
ARCH 487	Architecture Studio 5A	4.0
	Term Credits	7.0

Term 16

ARCH 336	Professional Practice II	3.0
ARCH 488	Architecture Studio 5B	4.0
	Term Credits	7.0

Term 17

ARCH 489	Architecture Studio 5C	4.0
PHIL 317	Ethics and Design Professions	3.0
	Term Credits	7.0

Term 18

Summer Quarter

Professional elective		3.0
Free Elective		3.0
History/Theory elective		3.0
	Term Credits	9.0

Sixth Year (Part-Time)

Term 19

ARCH 493	Senior Project I	4.0
Free elective		3.0
	Term Credits	7.0

Term 20

ARCH 494	Senior Project II	4.0
Professional elective		3.0
	Term Credits	7.0
Term 21		
ARCH 495	Senior Project III	4.0
Free elective		3.0
	Term Credits	7.0

Total Credit: 227.0

Degree Requirements (Part-time Evening Option)

General Education Requirements

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 171	Introduction to Analysis A	3.0
MATH 172	Introduction to Analysis B	3.0
MATH 173	Introduction to Analysis C	3.0
PHIL 317	Ethics and Design Professions	3.0
PHYS 182	Applied Physics I	3.0
PHYS 183	Applied Physics II	3.0
UNIV A101	The Drexel Experience	2.0
Arts and Humanities-students elect a minimum of 6 credits		6.0
Social Science-students elect a minimum of 6 credits		9.0
Natural Science-students elect a minimum of 3 credits		3.0
Free electives		24.0

Studios (Must be taken in order)

ARCH 107	Foundation Design I	2.0
ARCH 108	Foundation Design II	2.0
ARCH 109	Foundation Design III	2.0
ARCH 181	Architecture Studio 1A	4.0
ARCH 182	Architecture Studio 1B	4.0
ARCH 183	Architecture Studio 1C	4.0
ARCH 281	Architecture Studio 2A	4.0
ARCH 282	Architecture Studio 2B	4.0
ARCH 283	Architecture Studio 2C	4.0
ARCH 381	Architecture Studio 3A	4.0
ARCH 382	Architecture Studio 3B	4.0
ARCH 383	Architecture Studio 3C	4.0
ARCH 481	Architecture Studio 4A	4.0
ARCH 482	Architecture Studio 4B	4.0
ARCH 483	Architecture Studio 4C	4.0
ARCH 487	Architecture Studio 5A	4.0
ARCH 488	Architecture Studio 5B	4.0
ARCH 489	Architecture Studio 5C	4.0
ARCH 493	Senior Project I	4.0
ARCH 494	Senior Project II	4.0
ARCH 495	Senior Project III	4.0

Required Professional Courses (Part-time Evening Option)

ARCH 141	Architecture and Society I	3.0
ARCH 142	Architecture and Society II	3.0
ARCH 143	Architecture and Society III	3.0
ARCH 144	Architecture and Society IV	3.0
ARCH 211	Architectural Representation I	2.0
ARCH 212	Architectural Representation II	2.0
ARCH 213	Architectural Representation III	2.0
ARCH 221	Materials & Methods I	1.5
ARCH 222	Materials & Methods II	1.5
ARCH 223	Materials & Methods III	1.5
ARCH 224	Architectural Representation IV	2.0
ARCH 225	Architectural Representation V	2.0
ARCH 226	Architectural Representation VI	2.0
ARCH 251	Structural Systems I	1.5
ARCH 252	Structural Systems II	1.5
ARCH 253	Structural Systems III	1.5
ARCH 291	Building Systems I	1.5
ARCH 292	Building Systems II	1.5
ARCH 293	Building Systems III	1.5
ARCH 324	Materials & Methods IV	1.5
ARCH 325	Materials & Methods V	1.5
ARCH 326	Materials & Methods VI	1.5
ARCH 335	Professional Practice I	3.0
ARCH 336	Professional Practice II	3.0
ARCH 354	Structural Systems IV	1.5
ARCH 355	Structural Systems V	1.5
ARCH 356	Structural Systems VI	1.5
ARCH 394	Building Systems IV	1.5
ARCH 395	Building Systems V	1.5
ARCH 396	Building Systems VI	1.5
ARCH 431 [WI]	Architectural Programming	3.0

History and Theory Electives

Select three of the following:		9.0
ARCH 340	American Architecture & Urbanism	
ARCH 341 [WI]	Theories of Architecture I	
ARCH 342 [WI]	Theories of Architecture II	
ARCH 343	Theories of Architecture III	
ARCH 346 [WI]	History of Philadelphia Architecture	
ARCH 347 [WI]	Intensive Architectural Studies	
ARCH 348 [WI]	Studies in Vernacular Architecture	
ARCH 350	Contemporary Architecture	
ARCH 421 [WI]	Environmental Psychology and Design Theory	
ARCH 441	Urban Design Seminar	
ARCH T180	Special Topics in Architecture	
ARCH T280	Special Topics in Architecture	
ARCH T380	Special Topics in Architecture	
ARCH T480	Special Topics in Architecture	

Professional Electives

Select three of the following:		9.0
ARCH 432	The Development Process	
ARCH 451	Advanced Drawing	
ARCH 455	Computer Applications in Architecture I	
ARCH 456	Computer Applications in Architecture II	
ARCH 463	Emerging Architectural Technology	
ARCH 464	Building Enclosure Design	
ARCH 465	Energy and Architecture	
ARCH T180	Special Topics in Architecture	
ARCH T280	Special Topics in Architecture	
ARCH T380	Special Topics in Architecture	
ARCH T480	Special Topics in Architecture	
Total Credits		**227.0**

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study (Part-time Evening Option)

This curriculum format is adjustable to each student's academic situation. Transfer credit evaluation, prior architectural experience, and other considerations may restructure the student's yearly program schedule.

First Year (Part-Time)

Term 1		Credits
ARCH 107	Foundation Design I	2.0
ARCH 141	Architecture and Society I	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	9.0
Term 2		
ARCH 108	Foundation Design II	2.0
ARCH 142	Architecture and Society II	3.0
MATH 171	Introduction to Analysis A	3.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	9.0
Term 3		
ARCH 109	Foundation Design III	2.0
ARCH 143	Architecture and Society III	3.0
MATH 172	Introduction to Analysis B	3.0
	Term Credits	8.0
Term 4		
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 173	Introduction to Analysis C	3.0
Natural Science elective		3.0
	Term Credits	9.0

Second Year (Part-Time)

Term 5		
ARCH 181	Architecture Studio 1A	4.0
ARCH 211	Architectural Representation I	2.0
Social Science elective		3.0
	Term Credits	9.0
Term 6		
ARCH 144	Architecture and Society IV	3.0
ARCH 182	Architecture Studio 1B	4.0
ARCH 212	Architectural Representation II	2.0
	Term Credits	9.0
Term 7		
ARCH 183	Architecture Studio 1C	4.0
ARCH 213	Architectural Representation III	2.0
PHYS 182	Applied Physics I	3.0
	Term Credits	9.0
Term 8		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
Humanities elective		3.0
Free elective		3.0
	Term Credits	9.0

Third Year (Part-Time)

Term 9		
ARCH 221	Materials & Methods I	1.5
ARCH 224	Architectural Representation IV	2.0
ARCH 251	Structural Systems I	1.5
ARCH 281	Architecture Studio 2A	4.0
	Term Credits	9.0
Term 10		
ARCH 222	Materials & Methods II	1.5
ARCH 225	Architectural Representation V	2.0
ARCH 252	Structural Systems II	1.5
ARCH 282	Architecture Studio 2B	4.0
	Term Credits	9.0
Term 11		
ARCH 223	Materials & Methods III	1.5
ARCH 253	Structural Systems III	1.5
ARCH 283	Architecture Studio 2C	4.0
PHYS 183	Applied Physics II	3.0
	Term Credits	10.0
Term 12		
ARCH 226	Architectural Representation VI	2.0
Free electives		3.0
Humanities elective		3.0
	Term Credits	8.0

Fourth Year (Part-Time)

Term 13

ARCH 291	Building Systems I	1.5
ARCH 381	Architecture Studio 3A	4.0
ARCH 354	Structural Systems IV	1.5
History/Theory elective		3.0
	Term Credits	10.0

Term 14

ARCH 292	Building Systems II	1.5
ARCH 355	Structural Systems V	1.5
ARCH 382	Architecture Studio 3B	4.0
Free elective		3.0
	Term Credits	10.0

Term 15

ARCH 293	Building Systems III	1.5
ARCH 356	Structural Systems VI	1.5
ARCH 383	Architecture Studio 3C	4.0
Social Science elective		3.0
	Term Credits	10.0

Term 16

Free electives		6.0
Social science elective		3.0
	Term Credits	9.0

Fifth Year (Part-Time)

Term 17

ARCH 324	Materials & Methods IV	1.5
ARCH 394	Building Systems IV	1.5
ARCH 481	Architecture Studio 4A	4.0
	Term Credits	7.0

Term 18

ARCH 325	Materials & Methods V	1.5
ARCH 395	Building Systems V	1.5
ARCH 482	Architecture Studio 4B	4.0
	Term Credits	7.0

Term 19

ARCH 326	Materials & Methods VI	1.5
ARCH 396	Building Systems VI	1.5
ARCH 483	Architecture Studio 4C	4.0
	Term Credits	7.0

Term 20

History/Theory elective		3.0
ARCH 431 [WI]	Architectural Programming	3.0
Professional elective		3.0
	Term Credits	9.0

Sixth Year (Part-Time)

Term 21

ARCH 335	Professional Practice I	3.0
ARCH 487	Architecture Studio 5A	4.0
	Term Credits	7.0

Term 22

ARCH 336	Professional Practice II	3.0
ARCH 488	Architecture Studio 5B	4.0
	Term Credits	7.0

Term 23

PHIL 317	Ethics and Design Professions	3.0
ARCH 489	Architecture Studio 5C	4.0
	Term Credits	7.0

Term 24

History/Theory elective		3.0
Free Elective		3.0
Professional elective		3.0
	Term Credits	9.0

Seventh Year (Part-Time)

Term 25

ARCH 493	Senior Project I	4.0
Free elective		3.0
	Term Credits	7.0

Term 26

ARCH 494	Senior Project II	4.0
Professional elective		3.0
	Term Credits	7.0

Term 27

ARCH 495	Senior Project III	4.0
Free elective		3.0
	Term Credits	7.0

Total Credit: 227.0

*   Prior to taking this course student must meet program's minimum studio advancement requirements. See the program's Advising Guidelines (http://www.drexel.edu/westphal/undergraduate/ARCH/Curriculum/#c3) for more details.
**   See degree requirements (p. 501).

Opportunities

Drexel's work/study program is an experiential-based learning model that complements and provides an alternative to traditional full-time academic architecture programs. The Drexel model provides a practical, high-quality education to those students who seek early exposure to daily architectural practice as well as an affordable alternative to students who could not otherwise be able to enter the profession.

Ordinarily, Drexel's architecture graduates continue working for the firms that employed them during the work-study phase of their studies. In time, some architects reach positions of associate or partner in these offices, while others choose to launch their own firms. Urban design, historic preservation, interior design, and facilities management are some of the related careers that architectural graduates also pursue with similar patterns of success.

The Integrated Path to Architectural Licensure Initiative (IPAL) provides students the opportunity to achieve licensure upon graduation – an important innovation affording students the chance to jumpstart their careers through a curriculum of education, work experience and licensure examinations. Students follow either of Drexel's two options leading to the Bachelor of Architecture degree while preparing for and sitting for licensing exams during the summers following the third, fourth and fifth year of study. Our Architecture Program is part of a selective group of schools in the country to offer this opportunity, an initiative spearheaded by the National Council of Architectural Registration Boards (NCARB).

Drexel is located in University City, a Philadelphia neighborhood that includes several centers of education and research. Philadelphia itself offers an unparalleled collection of landmark architecture and urban planning that spans 300 years of development. The region has always been home to architectural firms of national and international prominence. A rich and varied environment combined with an accomplished and supportive professional community make Philadelphia an ideal laboratory for the study of architecture. All of the faculty in the program are active in the Philadelphia architecture community, many in leadership positions at firms.

Students seeking support for resume and portfolio development may schedule an appointment with the Associate Director for Student Placement by contacting the Architecture Program. Job listings exclusively for Drexel Architecture students can be found on the Architecture Opportunities site. (http://www.drexel.edu/westphal/academics/undergraduate/ARCH/Opportunities/) Firms seeking Drexel interns may contact students directly by finding student links to resume, worksample and web portfolios at this site.

Facilities

The Department's offices, studios and teaching facilities are located on floors 3, 3A, 4 and 4A of the URBN Center at 3501 Market Street. The Hybrid Making Lab (http://drexel.edu/westphal/about/overview/making_spaces/HybridMakingLab/) on the first floor is open to all Westphal students and has state-of-the-art fabricating equipment, accessible to students after required training. The Westphal Print Center (http://www.drexel.edu/westphal/about/overview/making_spaces/WestphalPrintCenter/) is a full-service, low-cost facility is located on the ground floor and is accessible to students from on and off campus. A full wood working shop is located in the Visual Studies Arts Annex at 3220 Cherry Street.

Art History

Major: Art History
Degree Awarded: Bachelor of Arts (BA) or Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 50.0703
Standard Occupational Classification (SOC) code: 25-4011

About the Program

The history of art explores the meanings, values, and purposes of the visual arts within the historical cultures that create them. Works of fine and applied arts are understood not merely as aesthetic forms, but as expressions of the social, economic, scientific, religious, and political contexts that gave rise to them. The study of art history thus effectively serves the high purposes of a liberal education by equipping students with an understanding of world cultures and their histories from multiple disciplinary perspectives, and by encouraging the development of critical thinking, reading, research, and writing skills.

The art history program has a uniquely flexible curricular design in that it permits students to pursue art history as either a Bachelor of Arts or a Bachelor of Science degree. The BA degree is intended for students wishing to become professional art historians or who wish to supplement the art history curriculum with other courses leading to a specific career path. The BS degree is designed to allow students to combine the art history major with another major or to tailor the curriculum to their specific interests and aspirations. Both the BA and BS degrees require a total of 180.0 credit hours.

Bachelor of Arts

The BA degree requires 60.0 credit hours of art history, 71.0-75.0 credit hours of General Education courses, and 46.0 credit hours of Free Electives. The BA degree requires a strong component of Arts and Humanities courses in order to prepare students to enter the professional world of art historians by exposing them to critical reasoning, philosophy, anthropology, literature, world cultures, and foreign languages. The 49.0 credit hours of Free Electives can be used under faculty advisement to take additional art history courses, develop special competencies and areas of interest (e.g., race and gender studies; the histories of technology, science and philosophy; Asian or Africana studies; writing, literature, and criticism; design history; museum studies, etc.), or gain competencies in various applied or technical areas. This BA program requires two 3-month co-ops.

Bachelor of Science

The BS degree also requires 60.0 credit hours of art history, but it only requires 35.0-39.0 credit hours of General Education courses, thereby freeing up 85.0 credit hours of coursework to accommodate another major or to design a personalized curriculum. The 85.0 credit hours of free electives provided by the BS degree permits the student to simultaneously pursue a second major, one or more minors, or simply explore the life of the mind by taking courses, with faculty advisement, in diverse fields.

This program does not require a co-#op taken in addition to that which is required by the second major.

Degree Requirements (BA)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General education requirements

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
Mathematics and Natural Science		12.0
ENGL: Western Literature Elective		3.0
ENGL: Non-Western Literature Elective		3.0
Required Arts and Humanities-students elect a minimum of 6 credits		6.0
HIST 161	Themes in World Civilization I	4.0
PHIL 101	Introduction to Western Philosophy	3.0
PHIL 105	Critical Reasoning	3.0
Select one of the following:		
HIST 162	Themes in World Civilization II	4.0
or HIST 163	Themes in World Civilization III	
Foreign Language		12.0
Social Sciences		6.0
ANTH 101	Introduction to Cultural Diversity	3.0
COOP 101	Career Management and Professional Development	0.0
PSCI 120	History of Political Thought	4.0
UNIV A101	The Drexel Experience	2.0
Electives [*]		46.0

Art History requirements

ARCH 141	Architecture and Society I	3.0
ARTH 101	History of Art I: Ancient to Medieval	3.0
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ARTH 103	History of Art III: Modern Art	3.0
ARTH 150	Art History Research Methods	3.0
ARTH 200	Principles and Methods of Art History	3.0
ARTH 300 [WI]	History of Modern Design	3.0
ARTH 301	Asian Art and Culture	3.0
ARTH 313	20th Century Art	3.0
or ARTH 314	Contemporary Art	
ARTH 325	Ancient Greek and Roman Art	3.0
or ARTH 327	Italian Renaissance Art	
ARTH 477	Art History Seminar	3.0
VSST 100	Introduction to Art & Design	3.0
or VSST 107	Introduction to Design for Media	
or VSST 110	Introductory Drawing	
Art History Electives select 8 courses from the following		**24.0**

Media Arts & Design

ARTH 320	Art in the Age of Technology
ARTH 335 [WI]	History of Costume I: Preclassical to Directoire
ARTH 336 [WI]	History of Costume II: Directoire to World War I
ARTH 337	History of Costume: Post World War I to Present
FMST 101	Film History I: Emergence
FMST 102	Film History II: New Waves
FMST 103	Film History III: Trends
PHTO 275 [WI]	History of Photography I
PHTO 276 [WI]	History of Photography II
VSCM 350 [WI]	Graphic Design: 20th Century and Beyond

Western Art: Ancient to Modern

ARTH 310	Early American Art
ARTH 326	Medieval Art
ARTH 328	Northern Renaissance
ARTH 329	Art of the 17th and 18th Centuries

Modern/Contemporary/Theory/Criticism

ARTH 311	Twentieth Century American Art
ARTH 312	Nineteenth Century Art
ARTH 314	Contemporary Art
ARTH 315	African-American Art
ARTH 317	Modern Art Theory and Criticism

Asia, Africa, Latin America

ARTH 302	Art of India
ARTH 303	Art of China
ARTH 304	Art of Japan
ARTH 316	African Art

Advanced Course Work

ARTH 400	Art History Senior Thesis
ARTH T380	Special Topics in Art History
ARTH T480	Special Topics in Art History
ARTH I399	Independent Study in Art History
ARTH I499	Independent Study in Art History

Architecture

ARCH 142	Architecture and Society II
ARCH 143	Architecture and Society III
ARCH 144	Architecture and Society IV
ARCH 344 [WI]	History of Modern Architecture I
ARCH 346 [WI]	History of Philadelphia Architecture
ARCH T480	Special Topics in Architecture

Total Credits	180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Degree Requirements (BS)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education requirements

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV A101	The Drexel Experience	2.0
Mathematics and Natural Science		12.0
Arts and Humanities Requirement		6.0
Required Social Sciences-students elect a minimum of 6 credits		6.0
Free Electives		85.0

Art History requirements

ARTH 101	History of Art I: Ancient to Medieval	3.0
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ARTH 103	History of Art III: Modern Art	3.0
ARCH 141	Architecture and Society I	3.0
ARTH 150	Art History Research Methods	3.0
ARTH 200	Principles and Methods of Art History	3.0
ARTH 300 [WI]	History of Modern Design	3.0
ARTH 301	Asian Art and Culture	3.0
ARTH 313	20th Century Art	3.0
or ARTH 314	Contemporary Art	
ARTH 325	Ancient Greek and Roman Art	3.0
or ARTH 327	Italian Renaissance Art	
ARTH 477	Art History Seminar	3.0
VSST 100	Introduction to Art & Design	3.0
or VSST 107	Introduction to Design for Media	
or VSST 110	Introductory Drawing	

Art History Electives: Select 8 courses from the following		**24.0**
Media Arts & Design		
ARTH 320	Art in the Age of Technology	
ARTH 335 [WI]	History of Costume I: Preclassical to Directoire	
ARTH 336 [WI]	History of Costume II: Directoire to World War I	
ARTH 337	History of Costume: Post World War I to Present	
FMST 101	Film History I: Emergence	
FMST 102	Film History II: New Waves	
FMST 103	Film History III: Trends	
PHTO 275 [WI]	History of Photography I	
PHTO 276 [WI]	History of Photography II	
VSCM 350 [WI]	Graphic Design: 20th Century and Beyond	
Western Art: Ancient to Modern		
ARTH 310	Early American Art	
ARTH 326	Medieval Art	
ARTH 328	Northern Renaissance	
ARTH 329	Art of the 17th and 18th Centuries	
Modern/Contemporary/Theory/Criticism		
ARTH 311	Twentieth Century American Art	
ARTH 312	Nineteenth Century Art	
ARTH 314	Contemporary Art	
ARTH 315	African-American Art	
ARTH 317	Modern Art Theory and Criticism	

Asia, Africa, Latin America		
ARTH 302	Art of India	
ARTH 303	Art of China	
ARTH 304	Art of Japan	
ARTH 316	African Art	
Advanced Course Work		
ARTH 400	Art History Senior Thesis	
ARTH I399	Independent Study in Art History	
ARTH I499	Independent Study in Art History	
ARTH T380	Special Topics in Art History	
ARTH T480	Special Topics in Art History	
Architecture		
ARCH 142	Architecture and Society II	
ARCH 143	Architecture and Society III	
ARCH 144	Architecture and Society IV	
ARCH 344 [WI]	History of Modern Architecture I	
ARCH 346 [WI]	History of Philadelphia Architecture	
ARCH T480	Special Topics in Architecture	
Total Credits		180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study (BA)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
ANTH 101	Introduction to Cultural Diversity	3.0
ARTH 101	History of Art I: Ancient to Medieval	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
HIST 161	Themes in World Civilization I	4.0
PHIL 101	Introduction to Western Philosophy	3.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	17.0
Term 2		

ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
HIST 162 or 163	Themes in World Civilization II / Themes in World Civilization III	4.0
PHIL 105	Critical Reasoning	3.0
UNIV A101	The Drexel Experience	1.0
Natural Science Elective		3.0
	Term Credits	17.0

Term 3

ARTH 103	History of Art III: Modern Art	3.0
ARTH 150	Art History Research Methods	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
Arts and Humanities elective		3.0
Social science elective		3.0
	Term Credits	15.0

Term 4

ARCH 141	Architecture and Society I	3.0
ARTH 301	Asian Art and Culture	3.0
COOP 101	Career Management and Professional Development	0.0
Foreign Language		4.0
Math		3.0
VSST requirement		3.0
	Term Credits	16.0

Term 5

ARTH 325 or 327	Ancient Greek and Roman Art / Italian Renaissance Art	3.0
Foreign Language		4.0
Math		3.0
Natural Science		3.0
Arts and Humanities elective		3.0
	Term Credits	16.0

Term 6

ARTH 200	Principles and Methods of Art History	3.0
PSCI 120	History of Political Thought	4.0
ENGL (Non-Western Literature)		3.0
Foreign Language		4.0
	Term Credits	14.0

Term 7

ARTH 300 [WI]	History of Modern Design	3.0
Art History elective		6.0
Free electives		7.0
	Term Credits	16.0

Term 8

ARTH 313 or 314	20th Century Art / Contemporary Art	3.0
ARTH 477	Art History Seminar	3.0
Art History elective		3.0
Free electives		6.0
	Term Credits	15.0

Term 9

Art History elective		3.0
Free electives		12.0
	Term Credits	15.0

Term 10

Art History elective		3.0
ENGL (Western Literature)		3.0
Social science elective		3.0
Elective		3.0
	Term Credits	12.0

Term 11

Art History electives	6.0
Free electives	9.0
Term Credits	15.0

Term 12

Art History elective	3.0
Free electives	9.0
Term Credits	12.0

Total Credit: 180.0

Sample Plan of Study (BS)

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
ARTH 101	History of Art I: Ancient to Medieval	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
UNIV A101	The Drexel Experience	1.0
Free elective		9.0
	Term Credits	16.0

Term 2

ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
UNIV A101	The Drexel Experience	1.0
Free elective		6.0
	Term Credits	13.0

Term 3

ARTH 103	History of Art III: Modern Art	3.0
ARTH 150	Art History Research Methods	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
Free elective		3.0
Social Science elective		3.0
	Term Credits	15.0

Term 4

ARCH 141	Architecture and Society I	3.0
ARTH 301	Asian Art and Culture	3.0
COOP 101	Career Management and Professional Development	0.0
Math		3.0
Natural Science		3.0
Social science elective		3.0
	Term Credits	15.0

Term 5

ARTH 325 or 327	Ancient Greek and Roman Art / Italian Renaissance Art	3.0
Math		3.0
Natural Science		3.0
Free elective		6.0
Arts and Humanities elective		3.0
	Term Credits	18.0

Term 6

ARTH 200	Principles and Methods of Art History	3.0
Free elective		12.0
	Term Credits	15.0

Term 7

ARTH 300 [WI]	History of Modern Design	3.0
Art History elective		6.0

Free elective		9.0
	Term Credits	18.0
Term 8		
ARTH 313	20th Century Art	3.0
or 314	Contemporary Art	
Art History elective		3.0
Free elective		6.0
ARTH 477	Art History Seminar	3.0
	Term Credits	15.0
Term 9		
Art History elective		3.0
Free elective		13.0
	Term Credits	16.0
Term 10		
Art History elective		6.0
Free Elective		3.0
Arts and Humanities elective		3.0
VSST requirement		3.0
	Term Credits	15.0
Term 11		
Art History elective		3.0
Free elective		9.0
	Term Credits	12.0
Term 12		
Art History elective		3.0
Free elective		9.0
	Term Credits	12.0

Total Credit: 180.0

Co-op/Career Opportunities

Co-op Opportunities

Drexel's enviable geographical location in the northeast corridor of the United States provides a distinct advantage for an art history program because of the proximity of many important Museums, galleries, and auction houses. The Philadelphia Museum of Art, Pennsylvania Academy of the Fine Arts, Barnes Foundation, Rodin Museum, Institute of Contemporary Art, and the Penn Museum of Archeology and Anthropology are all local and easily accessible. Museums, galleries and auction houses in New York, Washington, Baltimore and other east coast centers are all within a reasonable distance by train, bus, or car. These institutions will offer students an abundance of opportunities for first-hand study of the major collections of art, architecture, and design. Proximity to these institutions can also provide for many choice opportunities for cooperative education experiences.

Some possibilities include:

- Barnes Foundation
- Philadelphia Museum of Art
- Pennsylvania Academy of the Fine Arts
- American Philosophical Society
- Moderne Gallery
- Calderwood Gallery
- RagoArts Auction House, Lambertville, NJ
- Twelve Gates Gallery for Contemporary South Asian Art
- Newark Museum, NJ
- Metropolitan Museum of Art
- Brooklyn Museum
- Mural Arts Program

- Asia Society NY
- Christie's NY

Career Opportunities

A major in art history can prepare students for a wide variety of careers, as well as preparation for graduate school.

Possible career paths:

- Museum Administrator
- Gallery Director
- Curator
- Museum Registrar
- Museum Educator
- Art Consultant
- Art Librarian
- Editor
- Art and/or Intellectual Property Law
- Artist Representative
- Non-profit and governmental organizations
- Teacher (K-12)
- Teacher/Researcher (college and university)

As a particularly broad humanities discipline, art history serves as an outstanding pre-professional degree, providing excellent preparation for a wide variety of professions, such as law, medicine, education and library science.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Art History Faculty

Jennifer Blazina, MFA *(Cranbrook Academy of Art, Bloomfield Hills, MI).* Professor. Coordinator of printmaking, fine arts.

Mark Brack, PhD *(University of California at Berkeley).* Associate Professor. British and American architecture from 1700 to the present; Hispanic colonial architecture in the American Southwest; vernacular architecture; historic preservation.

Pia Brancaccio, PhD *(Istituto Universitario Orientale, Naples, Italy) Art History Program Co-Director.* Professor. South Asian art.

Lewis Colburn, MFA *(Syracuse University) Sculpture Area Coordinator.* Associate Professor. Sculpture, 3D design.

Anda Dubinskis, MFA *(University of Pennsylvania) Drawing Area Coordinator.* Teaching Professor. Drawing.

Joseph F. Gregory, PhD *(SUNY at Binghamton).* Associate Professor. Modern European art.

Linda Kim, PhD *(University of California, Berkeley).* Associate Professor. American art, African art.

Jacob Lunderby, MFA *(University of Minnesota).* Assistant Teaching Professor. Drawing

Elizabeth Milroy, PhD *(University of Pennsylvania) Department Head, Art and Art History; Program Director, Art History.* Professor. American art; history of museums and public spaces.

Orlando Pelliccia, MFA *Director of the Leonard Perlstein Gallery; Materials Coordinator.* Teaching Professor. Multimedia.

Bruce Pollock, MFA *(Tyler School of Art, Temple University) Painting Area Coordinator; Fine Arts minor advisor.* Associate Professor. Abstract painting and drawing.

Clare Sauro, MA *(Fashion Institute of Technology) Curator, Historic Costume Collection.* Associate Teaching Professor. Costume history.

Delia Solomons, PhD *(Institute of Fine Arts, New York University).* Assistant Professor. Contemporary art, Latin American art.

Sara Steinwachs, MFA *(Yale University) Visual Studies Area Coordinator.* Associate Professor. Drawing, painting and design.

Mark Stockton, MFA *(Syracuse University) Design for Media Area Coordinator.* Associate Teaching Professor. Drawing, painting, and design.

Joshua Weiss, MFA *(Yale University).* Associate Teaching Professor. Drawing, painting and design.

Emeritus Faculty

Lydia Hunn, MFA *(University of Pennsylvania) Multimedia Area Coordinator.* Professor Emerita. Installations, sculpture, painting and drawing.

Charles Morscheck, PhD *(Bryn Mawr College).* Professor Emeritus. Italian Renaissance art.

David Raizman, PhD *(University of Pittsburgh).* Distinguished University Professor. History of design, medieval art.

Blaise J. Tobia, MFA *(University of California, San Diego).* Professor Emeritus. Photo-based works, design, art theory.

Dance

Major: Dance
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 185.0
Co-op Options: One Co-op (Four years)
Classification of Instructional Program (CIP) code: 50.0399
Standard Occupational Classification (SOC) code: 25-1121; 27-2031; 27-2032

About the Program

The dance program at Drexel University provides intensive exploration of dance in its physical, intellectual, creative and therapeutic aspects. The major is designed for students to focus on one of the following four tracks:

- Dance/Movement Therapy
- Dance in Education
- Physical Therapy
- Performance

The dance major at Drexel University has a unique curriculum design and focus. This program combines rigorous academic coursework with extensive stage and studio dance experiences to prepare students for four possible career paths within dance: dance/movement therapy, dance in education, physical therapy and performance. Students participating in this major will earn a BS degree in dance with an optional minor in psychology.

Students focused on **dance/movement therapy** will prepare for jobs as dance/movement therapists. These are psychological counselors working in a variety of settings including hospitals, out-patient clinics and residential treatment centers. Students pursuing this option will earn a BS degree in dance at the Westphal College, through the Department of Performing Arts, for the first four years of study. They will then have the option to continue on to two years of study in the College of Nursing and Health Professions to earn an MA in Creative Arts in Therapy and become a licensed dance therapist.

The second career focus, **dance in education**, prepares students for jobs as elementary school teachers (grades Pre-K through 4) who may also serve as school dance specialists. Students choosing this option will earn a BS degree in dance through the Department of Performing Arts and may elect to continue for a fifth year of study to earn an MS in the Teaching, Learning & Curriculum through the School of Education. Students who successfully complete the five year BS/MS option in education will then be recommended to the State for a Pennsylvania Teaching Certificate in the area of Elementary Education for Pre-K to 4 certification, general education.

The third career focus, **physical therapy**, prepares students to work as physical therapists in a variety of settings, including hospitals, treatment centers, schools, and private practice. Students interested in the physical therapy option will complete the four-year BS degree in dance, along with a series of recommended electives in the physical sciences. After completion of the BS degree, students will continue their education for an additional three years in the College of Nursing and Health Professions to earn a DPT and become a licensed physical therapist.

The fourth option, **custom design**, allows students to work closely with faculty to create a personalized career in dance. Many students in this focus select **performance**, which prepares them to work as performers and/or choreographers in a variety of settings. Students interested in the performance option will complete the four-year BS degree in dance, with an emphasis on collaborative and interdisciplinary work.

The student who enters the dance major at Drexel University is an academically achieving student who has a deep curiosity for non-traditional careers in the field of dance. He or she is looking for extensive experiences to improve as a dancer, choreographer and performer while being stimulated academically. This student wants to study dance—-both physically and cognitively—in college while being offered the possibility of gainful employment after graduation.

For more information about this major, visit the Westphal College's Dance (http://www.drexel.edu/westphal/academics/undergraduate/DANC/) web page.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 171	Introduction to Analysis A	3.0
MATH 172	Introduction to Analysis B	3.0
PSY 101	General Psychology I	3.0
PSY 120	Developmental Psychology	3.0
PSY 240 [WI]	Abnormal Psychology	3.0
UNIV A101	The Drexel Experience	1.0
Two English (ENGL) electives		6.0
One Art or Humanities elective		3.0
Two Natural Science electives		8.0
Free electives		40.0

Dance Major Requirements

Foundation and Theory Requirements

ARTH 103	History of Art III: Modern Art	3.0
NFS 100 & NFS 101	Nutrition, Foods, and Health and Introduction to Nutrition & Food	3.0
THTR 240	Theatre Production I	3.0
MUSC 331	World Musics	3.0
DANC 108	Dance Improvisation I	2.0
DANC 115	Introduction to Dance	3.0
DANC 116	Dance and Fitness	3.0
DANC 117	Foundations of Somatic Theory and Practice	3.0
DANC 135	Rhythmic Study for Dance	3.0
DANC 215	Dance Appreciation	3.0
DANC 216	Introduction to Laban Movement Analysis	3.0
DANC 221	Survey of Dance and Movement Therapy	3.0
DANC 222	Dance Pedagogy	3.0
DANC 235	Dance Composition I	3.0
DANC 315	Twentieth Century Dance	3.0
DANC 316	Dance Kinesiology	3.0
DANC 335	Dance Composition II	3.0
DANC 415	Dance Aesthetics and Criticism	3.0
DANC 481	Senior Seminar in Dance	1.0
DANC 491	Senior Project in Dance (1.0 credit course repeated for a total of 3.0 credits)	3.0

Performance Requirements

DANC 131	Dance Practicum in Performance (1.0 credit course repeated for a total of 11.0 credits) *	11.0
or DANC 133	Dance Practicum in Choreography	

Technique Requirements

DANC 104	Ballet Technique I (2.0 credit course repeated for a total of 4.0 credits)	4.0
DANC 204	Ballet Technique II (2.0 credit course repeated for a total of 6.0 credits)	6.0
DANC 304	Ballet Dance Technique III (2.0 credit course repeated for a total of 4.0 credits)	4.0
DANC 105	Modern Dance Technique I (2.0 credit course repeated for a total of 4.0 credits)	4.0
DANC 205	Modern Dance Technique II (2.0 credit course repeated for a total of 6.0 credits)	6.0
DANC 305	Modern Dance Technique III (2.0 credit course repeated for a total of 4.0 credits)	4.0
Select two terms of one of the following:		4.0
DANC 106	Jazz Dance Technique I (2.0 credit course repeated for a total of 4.0 credits)	
DANC 107	Hip-Hop Dance Technique I (2.0 credit course repeated for a total of 4.0 credits)	
DANC 109	African Dance Technique I (2.0 credit course repeated for a total of 4.0 credits)	
Select one of the following		2.0
DANC 206	Jazz Dance Technique II	
DANC 306	Jazz Dance Technique III	
DANC 207	Hip-Hop Dance Technique II	
DANC 209	African Dance Technique II	
Total Credits		**185.0**

*   For DANC 131: Sections 001, 005, 006, 007, 008 ONLY

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
DANC 104	Ballet Technique I	2.0
DANC 105	Modern Dance Technique I	2.0
DANC 116	Dance and Fitness	3.0
DANC 131	Dance Practicum in Performance	1.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 171	Introduction to Analysis A	3.0
NFS 100 & NFS 101	Nutrition, Foods, and Health	3.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	18.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
DANC 105	Modern Dance Technique I	2.0
DANC 117	Foundations of Somatic Theory and Practice	3.0
DANC 131 or 133	Dance Practicum in Performance Dance Practicum in Choreography	1.0
DANC 135	Rhythmic Study for Dance	3.0

ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 172	Introduction to Analysis B	3.0
	Term Credits	16.0
Term 3		
DANC 115	Introduction to Dance	3.0
DANC 104	Ballet Technique I	2.0
DANC 131 or 133	Dance Practicum in Performance Dance Practicum in Choreography	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
PSY 101	General Psychology I	3.0
Select one of the following:		2.0
DANC 106	Jazz Dance Technique I	
DANC 206	Jazz Dance Technique II	
DANC 107	Hip-Hop Dance Technique I	
DANC 207	Hip-Hop Dance Technique II	
DANC 109	African Dance Technique I	
DANC 209	African Dance Technique II	
Free elective		3.0
	Term Credits	17.0
Term 4		
ARTH 103	History of Art III: Modern Art	3.0
DANC 108	Dance Improvisation I	2.0
DANC 131 or 133	Dance Practicum in Performance Dance Practicum in Choreography	1.0
DANC 205	Modern Dance Technique II	2.0
DANC 216	Introduction to Laban Movement Analysis	3.0
PSY 240 [WI]	Abnormal Psychology	3.0
	Term Credits	14.0
Term 5		
COOP 101	Career Management and Professional Development	0.0
DANC 131 or 133	Dance Practicum in Performance Dance Practicum in Choreography	1.0
DANC 221	Survey of Dance and Movement Therapy	3.0
DANC 222	Dance Pedagogy	3.0
DANC 235	Dance Composition I	3.0
PSY 120	Developmental Psychology	3.0
Select one of the following:		2.0
DANC 106	Jazz Dance Technique I	
DANC 206	Jazz Dance Technique II	
DANC 107	Hip-Hop Dance Technique I	
DANC 207	Hip-Hop Dance Technique II	
DANC 109	African Dance Technique I	
DANC 209	African Dance Technique II	
	Term Credits	15.0
Term 6		
DANC 131 or 133	Dance Practicum in Performance Dance Practicum in Choreography	1.0
DANC 204	Ballet Technique II	2.0
DANC 205	Modern Dance Technique II	2.0
MUSC 331	World Musics	3.0
THTR 240	Theatre Production I	3.0
Free Electives		6.0
	Term Credits	17.0
Term 7		
DANC 131 or 133	Dance Practicum in Performance Dance Practicum in Choreography	1.0
DANC 204	Ballet Technique II	2.0
DANC 215	Dance Appreciation	3.0
Arts and Humanities elective		3.0
English (ENGL) elective		3.0

Free elective		3.0
	Term Credits	15.0
Term 8		
DANC 131 or 133	Dance Practicum in Performance Dance Practicum in Choreography	1.0
DANC 204	Ballet Technique II	2.0
DANC 205	Modern Dance Technique II	2.0
DANC 315	Twentieth Century Dance	3.0
DANC 316	Dance Kinesiology	3.0
DANC 481	Senior Seminar in Dance	1.0
Select one of the following:		2.0
DANC 106	Jazz Dance Technique I	
DANC 206	Jazz Dance Technique II	
DANC 107	Hip-Hop Dance Technique I	
DANC 207	Hip-Hop Dance Technique II	
DANC 109	African Dance Technique I	
DANC 209	African Dance Technique II	
	Term Credits	14.0
Term 9		
DANC 131 or 133	Dance Practicum in Performance Dance Practicum in Choreography	1.0
DANC 304	Ballet Dance Technique III	2.0
DANC 305	Modern Dance Technique III	2.0
DANC 335	Dance Composition II	3.0
Natural Science elective		4.0
Free electives		6.0
	Term Credits	18.0
Term 10		
DANC 131 or 133	Dance Practicum in Performance Dance Practicum in Choreography	1.0
DANC 305	Modern Dance Technique III	2.0
DANC 491	Senior Project in Dance	1.0
Select two of the following:		4.0
DANC 106	Jazz Dance Technique I	
DANC 206	Jazz Dance Technique II	
DANC 107	Hip-Hop Dance Technique I	
DANC 207	Hip-Hop Dance Technique II	
DANC 109	African Dance Technique I	
DANC 209	African Dance Technique II	
Free electives		6.0
	Term Credits	14.0
Term 11		
DANC 131 or 133	Dance Practicum in Performance Dance Practicum in Choreography	1.0
DANC 491	Senior Project in Dance	1.0
DANC 305	Modern Dance Technique III	2.0
Natural Science elective		4.0
Free electives		6.0
	Term Credits	14.0
Term 12		
DANC 415	Dance Aesthetics and Criticism	3.0
DANC 491	Senior Project in Dance	1.0
English (ENGL) elective		3.0
Free electives		6.0
	Term Credits	13.0

Total Credit: 185.0

Co-op/Career Opportunities

The dance major is designed for students to focus on one of four career options. Several of the tracks lead to graduate study at Drexel or may be completed at the end of four years. Each also includes a co-op experience

that allows for extended interaction with professionals in dance therapy, physical therapy, education, and performance. Students wishing to change career focus throughout the course of the undergraduate curriculum will have the option to do so.

Students focusing on **dance/movement therapy** participate in a six month co-op experience during the spring and summer terms of their junior year. These students may participate in co-op with a practicing dance/movement therapist, community dance artist, or mental health professional in a mental health, social service, rehabilitation, medical, special education or community arts setting.

Students focusing on **physical therapy**, will participate in a six month co-op in which they work in a setting with a physical therapist, such as a hospital, treatment center, school, or private practice. Co-op experiences where students are able to work with physical therapists working on dancers as clients will be encouraged.

Students focusing on **dance in education** participate in after school dance programs, artist in residence school partnerships and auditorium lecture demonstration programs as part of a touring dance company run by the dance program at Drexel, or other dance education focused activities in a school or studio setting, during the fall and winter of their junior year as their co-op experience.

Students focusing on **custom design** or **performance** may participate in a six month co-op including performance, administration, production, event planning and grant writing. Students interested in performance will work with professional choreographers to experience multiple aspects of creating a sustainable life in performance and/or choreography.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Dance Faculty

Lindsay Browning, BFA *(Bradford University)*. Adjunct Assistant Professor. Yoga

Jim Bunting, BFA *(University of the Arts, Philadelphia)*. Adjunct Assistant Professor. Jazz dance.

Antoinette Coward-Gilmore, MA *(New York University)*. Adjunct Assistant Professor. African dance, modern dance.

Susan Deutsch Laban Movement Analysis

Clyde Evans Adjunct Assistant Professor. Director of Chosen Dance Company; hip-hop.

Chris Farrell, MBA *(Fordham University)*. Adjunct Assistant Professor. Rhythmic studies; accompaniment.

Brittany Fishel, MFA *(University of Michigan)*. Adjunct Assistant Professor. Jazz Dance, Screen dance

Miriam Giguere, PhD *(Temple University) Department Head, Performing Arts.* Professor. Dance History, Aesthetic and Criticism of Dance. President of Pennsylvania Dance Education Organization

Ama Gora, MFA *(Temple University) Director of Community Based Learning.* Storytelling, lineage and collectivity through dance

Valerie Ifill, MFA *(University of Oregon) Program Director, Dance; Director of the Youth Performance Exchange and Dornsife Dance* . Assistant Teaching Professor. Intersections of dance and the community

Lucinda Lea, BA *(Indiana University)*. Adjunct Assistant Professor. Ballet.

Beth McNamara, MA *(Hahnemann University)*. Adjunct Assistant Professor. Board-Certified Dance/Movement Therapist and Licensed Professional Counselor in Philadelphia

Jennifer Morley, MFA *(Temple University)*. Associate Teaching Professor. Master Pilates instructor and director of the Drexel Pilates Teaching Training program; modern dance, choreography.

Sandra Parks, MFA *(Smith College) Program Director*. Assistant Teaching Professor. Choreography, Ballet and Modern dance; President of Women in Dance

Olive Prince, MFA *(Temple University)*. Adjunct Assistant Professor. Choreography, creative process and improvisation; Director of Olive Prince Dance.

Meredith Rainey Adjunct Assistant Professor. Former soloist with Pennsylvania Ballet and director of Carbon Dance Theater. Ballet, choreography.

Lauren Stepanski, DPT *(Drexel University)*. Adjunct Assistant Professor. Dance kinesiology

Design & Merchandising

Major: Design and Merchandising
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 181.0
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 50.0499
Standard Occupational Classification (SOC) code: 13-1022

About the Program

Students in the Design & Merchandising program develop an appreciation for business, design and product quality. They learn to communicate verbally and visually about products across traditional and emerging media, and gain the business knowledge and skills required to promote and sell an aesthetically grounded point of view in the global marketplace.

The Design & Merchandising program at Drexel University's Antoinette Westphal College of Media Arts & Design educates and prepares students to effect change in the business of fashion via creative problem-solving in design and commerce. Through an interdisciplinary and experiential approach, we strive to graduate adaptable, creative, confident and passionate professionals who are technologically adept, creative thinkers, business minded and globally aware.

Through the dynamic classroom, co-op experience and study abroad opportunities (http://www.drexel.edu/studyabroad/), the program prepares students to create, merchandise, market, promote and distribute products, based on a knowledge of visual/aesthetic and business considerations. Design & Merchandising students graduate with the knowledge and skills needed for success in traditional and emerging roles in the global marketplace, and as practical and responsible corporate citizens who will make the world a better place.

Design & Merchandising majors focus study in the areas of retail & wholesale operations, merchandise management, visual merchandising, textiles, and manufacturing along with trend forecasting, marketing & media, and public relations & event production.

For more information about this major, visit the College's Design & Merchandising (http://www.drexel.edu/westphal/academics/undergraduate/DSMR/) page.

Degree Requirements

Students pursuing the Bachelor of Science in Design & Merchandising may complete a concentration in an Retail Buying & Merchandising using free electives or use these electives toward focused study in Media Merchandising (D&M Magazine), Fashion Show Production or Visual Merchandising (D&M Shop).

Concentration in Retail Buying & Merchandising
This concentration is designed to broaden students' practical and theoretical understanding of consumption as it relates to retail buying, management and merchandising. With the growth in omni-channel retail, students need to develop their skills not only for careers in traditional brick-and-mortar retailing establishments, but other retail models. These include: print and digital based retailing (catalog, television, and Internet). In this concentration, students explore all major retail merchandising and marketing channels and their requirements for buying, staffing, technology, logistics, distribution, and organizational behavior.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
ENVS 160	Environment in the News	2.0
ENVS 260	Environmental Science and Society	3.0
GEO 111	Natural Disasters	3.0
MATH 119	Mathematical Foundations for Design	4.0
UNIV A101	The Drexel Experience	2.0

Required Arts and Humanities

COM 220	Qualitative Research Methods	3.0
COM 230	Techniques of Speaking	3.0
Arts and Humanities elective *		3.0

Required Social Science

PSY 150	Introduction to Social Psychology	3.0
Social Science electives **		6.0

Visual Studies Requirements

ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ARTH 103	History of Art III: Modern Art	3.0
ARTH 314	Contemporary Art	3.0
PHTO 110	Photography	3.0
VSST 101	Design I	4.0
VSST 102	Design II	4.0
VSST 103	Design III	4.0
VSST 110	Introductory Drawing	3.0

Professional Requirements

ACCT 110	Accounting for Professionals	4.0
ARTH 335 [WI]	History of Costume I: Preclassical to Directoire	3.0
ARTH 336 [WI]	History of Costume II: Directoire to World War I	3.0
or ARTH 337	History of Costume: Post World War I to Present	
DSMR 100	Computer Imaging I	3.0
DSMR 103	Introduction to the Fashion Industry	3.0
DSMR 201	Analysis of Product	3.0
DSMR 210	Presentation Techniques Design and Merchandising	3.0
DSMR 211	Computer Design for Design and Merchandising	3.0
DSMR 230	Textiles for Design and Merchandising	3.0
DSMR 231	Retail Operations	3.0
DSMR 232	Merchandise Planning and Buying	4.0
DSMR 310	Merchandising Operations & Management	3.0
DSMR 311	Visual Merchandising	4.0
DSMR 333	Fashion Product Development	3.0
DSMR 454	Sourcing Strategies for Textile and Apparel	4.0
DSMR 464	Merchandising Analytics	4.0
DSMR 477 [WI]	Design and Merchandising Seminar	3.0
DSMR 496 [WI]	Senior Problem in Design and Merchandising	3.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
ENTP 105	Entrepreneurship Practice & Mindset	3.0
MKTG 201	Introduction to Marketing Management	4.0
MKTG 321	Selling and Sales Management	4.0
or MKTG 326	Marketing Insights	
or MKTG 344	Professional Personal Selling	
or MKTG 356	Consumer Behavior	
or MKTG 362	Brand and Reputation Management	
PHIL 301	Business Ethics	3.0
Career Pathway Electives ***		31.0
Total Credits		181.0

*   Arts and humanities electives must equal a minimum of 9.0 credits. Suggested arts and humanities electives: ENGL 303 *Science Fiction*; HIST 163 *Themes in World Civilization III* ENGL 335 *Mythology*; any foreign language.

**   Social science electives must equal a minimum of 9.0 credits. Suggested social science electives: SOC 210 *Race, Ethnicity and Social Inequality*; SOC 215 *Sociology of Work*; SOC 240 *Urban Sociology*; SOC 340 *Globalization*; SOC I499 *Independent Study in SOC*.

*** Career Pathway Electives enable students to pursue specific areas of study which compliment the Design & Merchandising major and the student's desired career pathway.

Concentration Option

Retail Buying & Merchandising Concentration

Required Courses

DSMR 233 [WI]	Retail Image Analysis	3.0
DSMR 313	International Fashion Merchandising	3.0
DSMR 324	Retail Intersections: Social & Cultural Issues	3.0
DSMR 325	Advanced Merchandise Planning and Buying	4.0
Select three from the following:		12.0
DSMR 326	Fashion Product Promotion	
DSMR 397	Retail Practicum	
MKTG 324	Marketing Channels and Distribution Systems	
MKTG 344	Professional Personal Selling	
MKTG 355	Interactive Marketing	

MKTG 356	Consumer Behavior	
Total Credits		25.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plans of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Fall/Winter Co-op (Cycle A)

Term 1

		Credits
DSMR 103	Introduction to the Fashion Industry	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
ENVS 260	Environmental Science and Society	3.0
UNIV A101	The Drexel Experience	1.0
VSST 110	Introductory Drawing	3.0
VSST 101	Design I	4.0
	Term Credits	17.0

Term 2

DSMR 100	Computer Imaging I	3.0
DSMR 230	Textiles for Design and Merchandising	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
GEO 111	Natural Disasters	3.0
UNIV A101	The Drexel Experience	1.0
VSST 102	Design II	4.0
	Term Credits	17.0

Term 3

CIVC 101	Introduction to Civic Engagement	1.0
DSMR 201	Analysis of Product	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
ENVS 160	Environment in the News	2.0
MATH 119	Mathematical Foundations for Design	4.0
VSST 103	Design III	4.0
	Term Credits	17.0

Term 4

ACCT 110	Accounting for Professionals	4.0
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
COM 230	Techniques of Speaking	3.0
COM 220, DSMR 231, DSMR 211, PSY 150, or PHTO 110	Qualitative Research Methods Retail Operations Computer Design for Design and Merchandising Introduction to Social Psychology Photography	3.0
	Term Credits	13.0

Term 5

ARTH 103	History of Art III: Modern Art	3.0
COOP 101	Career Management and Professional Development	0.0
DSMR 231	Retail Operations	3.0
DSMR 211 or COM 220	Computer Design for Design and Merchandising Qualitative Research Methods	3.0
ECON 201	Principles of Microeconomics	4.0
Career Pathway Elective		3.0
	Term Credits	16.0

Term 6

DSMR 232	Merchandise Planning and Buying	4.0
DSMR 210, COM 220, or PSY 150	Presentation Techniques Design and Merchandising Qualitative Research Methods Introduction to Social Psychology	3.0
ECON 202	Principles of Macroeconomics	4.0
MKTG 201	Introduction to Marketing Management	4.0
Career Pathway Elective		3.0
	Term Credits	18.0

Term 7

ENTP 105	Entrepreneurship Practice & Mindset	3.0
DSMR 210, COM 220, or PHTO 110	Presentation Techniques Design and Merchandising Qualitative Research Methods Photography	3.0
Career Pathway Electives		6.0
	Term Credits	12.0

Term 8

ARTH 314	Contemporary Art	3.0
DSMR 310	Merchandising Operations & Management	3.0
DSMR 333	Fashion Product Development	3.0
Career Pathway Electives		6.0
	Term Credits	15.0

Term 9

DSMR 464 or 311	Merchandising Analytics Visual Merchandising	4.0
DSMR 477 [WI]	Design and Merchandising Seminar	3.0
MKTG 321, 326, 344, 356, or 362	Selling and Sales Management Marketing Insights Professional Personal Selling Consumer Behavior Brand and Reputation Management	4.0
Social Science		3.0
Career Pathway Elective		3.0
	Term Credits	17.0

Term 10

ARTH 335 [WI]	History of Costume I: Preclassical to Directoire	3.0
DSMR 477 [WI] or 496 [WI]	Design and Merchandising Seminar Senior Problem in Design and Merchandising	3.0
DSMR 464 or 454	Merchandising Analytics Sourcing Strategies for Textile and Apparel	4.0
Career Pathway Elective		3.0
	Term Credits	13.0

Term 11

ARTH 336 [WI] or 337	History of Costume II: Directoire to World War I History of Costume: Post World War I to Present	3.0

DSMR 454 or 464	Sourcing Strategies for Textile and Apparel / Merchandising Analytics	4.0
DSMR 477 [WI] or 496 [WI]	Design and Merchandising Seminar / Senior Problem in Design and Merchandising	3.0
Career Pathway Elective		3.0
	Term Credits	13.0

Term 12

PHIL 301	Business Ethics	3.0
Social Science (choice)		3.0
Career Pathway Elective		4.0
Arts and Humanities (choice)		3.0
	Term Credits	13.0

Total Credit: 181.0

Fall/Winter Co-op (Cycle A - London Option)

Term 1		Credits
DSMR 103	Introduction to the Fashion Industry	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
ENVS 260	Environmental Science and Society	3.0
UNIV A101	The Drexel Experience	1.0
VSST 101	Design I	4.0
VSST 110	Introductory Drawing	3.0
	Term Credits	17.0

Term 2

DSMR 100	Computer Imaging I	3.0
DSMR 230	Textiles for Design and Merchandising	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
GEO 111	Natural Disasters	3.0
UNIV A101	The Drexel Experience	1.0
VSST 102	Design II	4.0
	Term Credits	17.0

Term 3

CIVC 101	Introduction to Civic Engagement	1.0
DSMR 201	Analysis of Product	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
ENVS 160	Environment in the News	2.0
MATH 119	Mathematical Foundations for Design	4.0
VSST 103	Design III	4.0
	Term Credits	17.0

Term 4

ACCT 110	Accounting for Professionals	4.0
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
COM 230	Techniques of Speaking	3.0
DSMR 211, 231, COM 220, PHTO 110, or PSY 150	Computer Design for Design and Merchandising / Retail Operations / Qualitative Research Methods / Photography / Introduction to Social Psychology	3.0
	Term Credits	13.0

Term 5

ARTH 103	History of Art III: Modern Art	3.0
COM 220 or DSMR 211	Qualitative Research Methods / Computer Design for Design and Merchandising	3.0
COOP 101	Career Management and Professional Development	0.0
DSMR 231	Retail Operations	3.0
ECON 201	Principles of Microeconomics	4.0
Career Pathway Elective		3.0
	Term Credits	16.0

Term 6

COM 220, DSMR 210, or PSY 150	Qualitative Research Methods / Presentation Techniques Design and Merchandising / Introduction to Social Psychology	3.0
DSMR 232	Merchandise Planning and Buying	4.0
ECON 202	Principles of Macroeconomics	4.0
MKTG 201	Introduction to Marketing Management	4.0
Career Pathway Elective		3.0
	Term Credits	18.0

Term 7

COM 220, DSMR 210, or PHTO 110	Qualitative Research Methods / Presentation Techniques Design and Merchandising / Photography	3.0
ENTP 105	Entrepreneurship Practice & Mindset	3.0
Career Pathway Electives		6.0
	Term Credits	12.0

Term 8

DSMR 310	Merchandising Operations & Management	3.0
DSMR 333	Fashion Product Development	3.0
MKTG 321, 326, 344, 356, or 362	Selling and Sales Management / Marketing Insights / Professional Personal Selling / Consumer Behavior / Brand and Reputation Management	4.0
Career Pathway Electives		6.0
	Term Credits	16.0

Term 9

London Classes

ARTH 314	Contemporary Art	3.0
Social Science (choice)		3.0
Career Pathway Electives		9.0
	Term Credits	15.0

Term 10

ARTH 335 [WI]	History of Costume I: Preclassical to Directoire	3.0
DSMR 311	Visual Merchandising	4.0
DSMR 454 or 464	Sourcing Strategies for Textile and Apparel / Merchandising Analytics	4.0
DSMR 477 [WI] or 496 [WI]	Design and Merchandising Seminar / Senior Problem in Design and Merchandising	3.0
	Term Credits	14.0

Term 11

ARTH 336 [WI] or 337	History of Costume II: Directoire to World War I / History of Costume: Post World War I to Present	3.0
DSMR 477 [WI] or 496 [WI]	Design and Merchandising Seminar / Senior Problem in Design and Merchandising	3.0
DSMR 454 or 464	Sourcing Strategies for Textile and Apparel / Merchandising Analytics	4.0
Career Pathway Elective		3.0
	Term Credits	13.0

Term 12

PHIL 301	Business Ethics	3.0
Social Science (choice)		3.0
Career Pathway Elective		4.0
Arts and Humanities (choice)		3.0
	Term Credits	13.0

Total Credit: 181.0

Spring/Summer Co-op (Cycle B)

Term 1		Credits
DSMR 103	Introduction to the Fashion Industry	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
ENVS 260	Environmental Science and Society	3.0
UNIV A101	The Drexel Experience	1.0

VSST 101	Design I	4.0
VSST 110	Introductory Drawing	3.0
	Term Credits	17.0
Term 2		
DSMR 100	Computer Imaging I	3.0
DSMR 230	Textiles for Design and Merchandising	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
GEO 111	Natural Disasters	3.0
UNIV A101	The Drexel Experience	1.0
VSST 102	Design II	4.0
	Term Credits	17.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
DSMR 201	Analysis of Product	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
ENVS 160	Environment in the News	2.0
MATH 119	Mathematical Foundations for Design	4.0
VSST 103	Design III	4.0
	Term Credits	17.0
Term 4		
ACCT 110	Accounting for Professionals	4.0
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
COM 220, DSMR 211, DSMR 231, PSY 150, or PHTO 110	Qualitative Research Methods Computer Design for Design and Merchandising Retail Operations Introduction to Social Psychology Photography	3.0
COM 230	Techniques of Speaking	3.0
	Term Credits	13.0
Term 5		
ARTH 103	History of Art III: Modern Art	3.0
COM 220 or DSMR 211	Qualitative Research Methods Computer Design for Design and Merchandising	3.0
COOP 101	Career Management and Professional Development	0.0
DSMR 231	Retail Operations	3.0
ECON 201	Principles of Microeconomics	4.0
Career Pathway Elective		3.0
	Term Credits	16.0
Term 6		
COM 220, DSMR 210, or PSY 150	Qualitative Research Methods Presentation Techniques Design and Merchandising Introduction to Social Psychology	3.0
DSMR 232	Merchandise Planning and Buying	4.0
ECON 202	Principles of Macroeconomics	4.0
MKTG 201	Introduction to Marketing Management	4.0
Career Pathway Elective		3.0
	Term Credits	18.0
Term 7		
COM 220, DSMR 210, or PHTO 110	Qualitative Research Methods Presentation Techniques Design and Merchandising Photography	3.0
ENTP 105	Entrepreneurship Practice & Mindset	3.0
Career Pathway Electives		6.0
	Term Credits	12.0
Term 8		
ARTH 314	Contemporary Art	3.0
DSMR 310	Merchandising Operations & Management	3.0
DSMR 333	Fashion Product Development	3.0
Career Pathway Electives		6.0
	Term Credits	15.0
Term 9		

DSMR 464 or 311	Merchandising Analytics Visual Merchandising	4.0
DSMR 477 [WI] or 496 [WI]	Design and Merchandising Seminar Senior Problem in Design and Merchandising	3.0
MKTG 321, 326, 344, 356, or 362	Selling and Sales Management Marketing Insights Professional Personal Selling Consumer Behavior Brand and Reputation Management	4.0
Social Science (choice)		3.0
Career Pathway Elective		3.0
	Term Credits	17.0
Term 10		
ARTH 335 [WI]	History of Costume I: Preclassical to Directoire	3.0
DSMR 454 or 464	Sourcing Strategies for Textile and Apparel Merchandising Analytics	4.0
DSMR 477 [WI] or 496 [WI]	Design and Merchandising Seminar Senior Problem in Design and Merchandising	3.0
Career Pathway Elective		3.0
	Term Credits	13.0
Term 11		
ARTH 336 [WI] or 337	History of Costume II: Directoire to World War I History of Costume: Post World War I to Present	3.0
DSMR 454 or 464	Sourcing Strategies for Textile and Apparel Merchandising Analytics	4.0
DSMR 477 [WI] or 496 [WI]	Design and Merchandising Seminar Senior Problem in Design and Merchandising	3.0
Career Pathway Elective		3.0
	Term Credits	13.0
Term 12		
PHIL 301	Business Ethics	3.0
Social Science (choice)		3.0
Career Pathway Elective		4.0
Arts and Humanities (choice)		3.0
	Term Credits	13.0

Total Credit: 181.0

Co-op/Career Opportunities

Opportunities

An education in Design & Merchandising prepares individuals for a wide variety of career paths. Graduates often pursue opportunities in buying, merchandising and retail operations; fashion and home product development; fashion product promotion; media merchandising; and public relations. More recently, graduates select careers in merchandising technologies, or customer relationship management. Students may elect to choose a minor opening up an unlimited number of options.

Co-Op Experiences

Some past co-op employments of design and merchandising students include:

- Assistant Buyer, Urban Outfitters/Anthropologie, Philadelphia, PA
- Merchandising Co-op, TJX Companies, Framingham, MA
- Merchandising Assistant, Nation Design, New York, NY
- Product Development, Boathouse Sports, Philadelphia, PA
- Merchandising Co-op, Mundi Westport Group, New York, NY
- Creative and Digital Assistant, Article 22, Brooklyn, NY
- Public Relations Assistant, QVC, West Chester, PA
- Assistant Fashion Coordinator, Special Events Department, Saks Fifth Avenue

- Fashion Showroom Co-op, BCBG Max Azria, New York, NY
- Public Relations Assistant, Neiman Marcus, King of Prussia, PA
- Design/Market Co-op, Charlotte Ronson, New York, NY
- Public Relations Co-op, KB Brand Partners, New York, NY
- Production Co-op, Derek Lam, New York, NY
- Retail/Manufacturing/Merchandising Asst., Nicole Miller, Philadelphia PA

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Dual/Accelerated Degree Program

Only available to Design & Merchandising majors (4-year with co-op), this dual degree program combines study in the areas of fashion retail merchandising and product development with the MBA degree. The program is designed to allow students to complete both the bachelor's degree and the Master of Business Administration degree in five years.

Incoming freshmen selected for this program will generally have a minimum of 1350 on the SAT, a GPA of 3.5 or better, and rank in the top 10% of their high school graduating class. A strong candidate for this program will have taken significant AP coursework while in high school.

Degree Requirements

The degree requirements for each program are located on the following pages:

- BS in Design & Merchandising Requirements (p. 513)
- MBA Requirements (http://catalog.drexel.edu/graduate/collegeofbusiness/businessadministration/#degreerequirementstext)

Additional requirements for the dual degree program

- A cumulative GPA of at least 3.2 is required throughout the program.
- Students must take the GMAT examination and achieve a minimum score of 570 prior to the end of the tenth term in order to continue in the program. It is recommended that students take the GMAT examination late in the student's third year.
- Students must submit an acceptable of plan of study at least three terms before anticipated start of graduate part of the program.

Students should visit the Westphal College of Media Arts and Design (http://www.drexel.edu/westphal/) for more information.

Fashion, Product Design & Merchandising Faculty

Kristen Ainscoe, BS *(Drexel University)*. Assistant Teaching Professor. Visual merchandiser; merchandise management.

Christine Baeza, MLD *(Penn State University)*. Assistant Teaching Professor. Ethics, social justice & sustainability, design thinking, merchandising management, textiles and circularity, social entrepreneurship.

Catherine Byers, MA *(American University)*. Assistant Teaching Professor. Journalism; marketing and communications.

Nick Cassway, BFA *(Tyler School of Art)*. Associate Teaching Professor. Curating; experimental portraiture; computer design.

Anne Cecil, MA *(University of the Arts)*. Adjunct Instructor. Web designer, product designer, merchandising and artist.

Joseph H. Hancock, II, PhD *(Ohio State University)*. Professor. Apparel merchandising, textiles and clothing, culture and marketing strategies.

Rachel Mednick, MS *(LIM College)*. Adjunct Instructor. Fashion sustainability, textiles, entrepreneurship, fashion presentation and show production.

Beth Phillips, MS *(Georgetown University)*. Teaching Professor. Business and international marketing, linguist, analysis of products.

Entertainment & Arts Management

Major: Entertainment & Arts Management
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 185.0
Co-op Options: One Co-op (Four years)
Classification of Instructional Program (CIP) code: 50.1001
Standard Occupational Classification (SOC) code: 13-1011

About the Program

The Entertainment & Arts Management (EAM) program at Drexel University is a nationally ranked, international leader in teaching the business of show business. Our unique program is a business degree, yet one that is based in the entertainment and arts sectors. Students in the Entertainment and Arts Management major choose an area of concentration from media, performing arts, or visual arts management disciplines. The curriculum is designed to prepare students to lead and manage in both commercial and non-profit areas of the field. Concentrations are available in: Cinema and Television, Performing Arts, Dance, Theatre, Visual Arts, Digital Media, and Sports Entertainment. Coursework in the EAM program includes general education, core requirements and features a built-in business minor. Students also enjoy a wide-selection of specialized coursework within their chosen area of concentration.

Unlike other undergraduate programs in this field, students are not required to choose commercial or nonprofit. Our philosophy is to prepare students for leadership careers in the vast world or arts and entertainment. This gives EAM students increased flexibility when choosing their career paths, and a distinct professional advantage in today's ever-changing arts and entertainment industries.

Our Goal

Our overall goal in the EAM program is to prepare students for leadership careers in the entertainment and arts fields by giving them:

- a broad understand of the business of entertainment & the arts, from for-profit commercial entertainment companies to non-profit arts & culture organizations;
- real world work experience;
- creative skills development in the discipline that interests them, and
- expert advice and insight from practicing professionals.

BS/MS Option

Students who complete the Entertainment & Arts Management program may also choose to pursue a graduate degree in Drexel

University's Westphal College in television management or arts administration and museum leadership. Students who graduate with a 3.5 GPA in the last two years of the program who apply to the MS in Arts Administration and Museum Leadership (http://catalog.drexel.edu/graduate/collegeofmediaartsanddesign/artsadministrationandmuseumleadership/) are automatically accepted into the MS program. Other graduate degrees within the college are available to students as well.

Dual Degree BS/MBA Option

Students majoring in Entertainment and Arts Management (4-year with co-op) may choose the BS Entertainment and Arts Management/MBA dual degree option. This highly attractive program option combines study in the management of the arts and entertainment industries along with the MBA degree. The program is designed to allow students to complete both the bachelor's degree and the MBA in **five** years.

Applying to the Dual Degree BS/MBA Option

Freshman applicants to the Entertainment & Arts Management program with a combined Math and Critical Reading SAT score of 1300 and a 3.5 GPA may apply for the BS/MBA program at the time of their initial application to Drexel University. Current students may choose to apply to the dual degree option once they have achieved between 90.0 and 120.0 credits. All students who are accepted into the accelerated program must maintain a 3.2 GPA as an EAM undergraduate, and must submit 2 letters of recommendation and meet minimum GMAT requirements at the time of the application to the MBA program.

For more information about this major, visit the College's Entertainment & Arts Management (http://www.drexel.edu/westphal/academics/undergraduate/eam/) page.

Degree Requirements

Coursework in the EAM program includes general education and core requirements as well as specialized coursework within the student's chosen area of concentration and, if applicable, within a specific arts or media discipline. For instance, within the media management concentration, students choose coursework in one of two disciplines: film, video, and screenwriting or digital media. In the performing arts management concentration, students choose coursework in a dance, performing arts, or theatre discipline.

The core requirements provide an overview of the student's future career field and its required key skills and abilities. The core requirements build a foundation for further advanced and specialized courses, taught in the student's area of concentration. At the end of their freshman year, students select one of the following concentrations:

- **(A) Visual Arts Management Concentration**
- **(B) Performing Arts Management**
  a. Dance Concentration
  b. Performing Arts Concentration
  c. Theatre Concentration
- **(C) Media Management**
  a. Digital Media Concentration
  b. Cinema and Television Concentration
- **(D) Sports Entertainment Concentration**

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements		
Written Analysis and Communication Requirements		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
Mathematics and Natural Sciences Requirements		
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
Select one of the following sequences:		6.0-8.0
Biology		
BIO 100	Applied Cells, Genetics & Physiology	
BIO 101	Applied Biological Diversity, Ecology & Evolution	
Physics		
PHYS 170	Electricity and Motion	
PHYS 171	Computational Lab for Electricity and Motion	
PHYS 175	Light and Sound	
PHYS 176	Computational Lab for Light and Sound	
Arts/Humanities Requirements		
COM 230	Techniques of Speaking	3.0
Required Arts and Humanities-students elect a minimum of 6 credits		6.0
Social Science Requirements		
Required Social Science-students elect a minimum of 9.0 credits		9.0
University Seminar Requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
UNIV A101	The Drexel Experience	2.0
Free electives [*]		21.0
Entertainment and Arts Management Core Requirements		
ACCT 110	Accounting for Professionals	4.0
BLAW 201	Business Law I	4.0
DSMR 100	Computer Imaging I [**]	3.0
EAM 130	Overview of Entertainment and Arts Management	3.0
EAM 200	Introduction to the Music Industry	3.0
EAM 211	Strategic Management for Entertainment and Arts Management	3.0
EAM 261	Copyrights and Trademarks	3.0
EAM 312	Introduction to Fund Development for the Arts	3.0
EAM 340	Artist Representation and Management	3.0
EAM 350	Arts, Culture and Society	3.0
EAM 361	Law for Entertainment and Arts Management Managers	3.0
EAM 391 [WI]	Entertainment Promotion and Branding	3.0
EAM 491	Entertainment and Arts Management Senior Project [***]	3.0
ECON 201	Principles of Microeconomics	4.0
HRMT 323	Principles of Human Resource Administration	4.0
MKTG 201	Introduction to Marketing Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
TVIE 290	Introduction to Money and the Media	3.0
Select one of the following:		4.0
ACCT 116	Managerial Accounting Foundations	
MKTG 356	Consumer Behavior	
Select two of the following: [†]		8.0
ECON 202	Principles of Macroeconomics	
FIN 301	Introduction to Finance	
MIS 200	Management Information Systems	
OPM 200	Operations Management	
STAT 201	Introduction to Business Statistics	

STAT 202	Business Statistics II	
Concentration Requirements *		**48.0**
Total Credits		185.0-187.0

* Minimum number of free electives depends on chosen concentration.
** Digital Media track students should take DIGM 100 in place of DSMR 100
*** EAM 491 is a 1.0 credit course, taken 3 times during the senior year, for a total of 3.0 credits.
† BS/MBA students should take STAT 201 and FIN 301. Students who take STAT 201 and FIN 301 should not take BUSN 301.

Concentration Requirements
A. Visual Arts Management Concentration

ARTH 101	History of Art I: Ancient to Medieval	3.0
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ARTH 103	History of Art III: Modern Art	3.0
EAM 270	Audience Development for Arts	3.0
EAM 301	Gallery and Collection Management	3.0
EAM 302	Exhibition Design	3.0
EAM 401 [WI]	Writing for Arts Managers	3.0
EAM 471	Fine Arts Market Development	3.0
EAM 472	Trends in Visual Arts	3.0
Visual Arts students select 21 additional credits from the following:		**21.0**
ARTH 300 [WI]	History of Modern Design	
INTR 200	History of Modern Architecture and Interiors	
PHTO 110	Photography	
PHTO 210	Intermediate Photography	
PHTO 275 [WI]	History of Photography I	
PHTO 276 [WI]	History of Photography II	
VSST 100	Introduction to Art & Design	
VSST 101	Design I	
VSST 102	Design II	
VSST 103	Design III	
VSST 107	Introduction to Design for Media	
VSST 110	Introductory Drawing	
VSST 111	Figure Drawing I	
VSST 112	Figure Drawing II	
VSST 301	Painting I	
VSST 302	Painting II	
VSST 303	Painting III	
Total Credits		48.0

B. Performing Arts Management
1. Dance Concentration

DANC 104	Ballet Technique I	2.0
DANC 105	Modern Dance Technique I	2.0
DANC 106 or DANC 107	Jazz Dance Technique I Hip-Hop Dance Technique I	2.0
DANC 115	Introduction to Dance	3.0
DANC 135	Rhythmic Study for Dance	3.0
DANC 215	Dance Appreciation	3.0
DANC 235	Dance Composition I	3.0
DANC 315	Twentieth Century Dance	3.0
EAM 270	Audience Development for Arts	3.0
EAM 313	Volunteer and Board Management	3.0
EAM 321	Box Office and Venue Management	3.0
EAM 322	Performing Arts Touring	3.0

EAM 325	Producing for Live Entertainment	3.0
EAM 401 [WI]	Writing for Arts Managers	3.0
MUSC 130	Introduction to Music	3.0
THTR 240	Theatre Production I	3.0
Six terms of Dance ensembles (DANC 131 - DANC 132)		3.0
Total Credits		48.0

2. Performing Arts Concentration

DANC 115	Introduction to Dance	3.0
DANC 215	Dance Appreciation	3.0
DANC 315	Twentieth Century Dance	3.0
EAM 270	Audience Development for Arts	3.0
EAM 313	Volunteer and Board Management	3.0
EAM 321	Box Office and Venue Management	3.0
EAM 322	Performing Arts Touring	3.0
EAM 325	Producing for Live Entertainment	3.0
EAM 401 [WI]	Writing for Arts Managers	3.0
MUSC 130	Introduction to Music	3.0
Choose 2 of the following 5 MUSC courses		6.0
MUSC 331	World Musics	
MUSC 333	Afro-American Music USA	
MUSC 338 [WI]	American Popular Music	
MUSC 236	Rock Music Through the Mid-60s	
MUSC 238	Rock Music Since the Mid-60s	
THTR 115	Theatrical Experience	3.0
THTR 210	Acting: Fundamentals	3.0
THTR 240	Theatre Production I	3.0
Six terms of Performing Arts ensembles (3 classes must be taken for 1 credit each. One must be THTR 130)		3.0
Total Credits		48.0

3. Theatre Concentration

EAM 270	Audience Development for Arts	3.0
EAM 313	Volunteer and Board Management	3.0
EAM 321	Box Office and Venue Management	3.0
EAM 322	Performing Arts Touring	3.0
EAM 325	Producing for Live Entertainment	3.0
EAM 401 [WI]	Writing for Arts Managers	3.0
THTR 121 [WI]	Dramatic Analysis	3.0
THTR 210	Acting: Fundamentals	3.0
THTR 211	Acting: Scene Study	2.0
THTR 221 [WI]	Theatre History I	3.0
THTR 222 [WI]	Theatre History II	3.0
THTR 240	Theatre Production I	3.0
THTR 260	Production Design	3.0
THTR 320	Play Direction	3.0
One Theatre (THTR) elective		3.0
Six terms of Theatre Practicum Courses *		4.0
Total Credits		48.0

* THTR 130, THTR 131, THTR 132

C. Media Management
1. Digital Media Concentration

ANIM 140	Computer Graphics Imagery I	3.0
COM 111	Principles of Communication	3.0
COM 240	New Technologies In Communication	3.0
COM 270 [WI]	Business Communication	3.0
DIGM 105	Overview of Digital Media	3.0
EAM 365	Media and Entertainment Business	3.0

FMTV 110	Basic Cinematography	3.0
GMAP 260	Overview of Computer Gaming	3.0
IDM 100	Introduction to Web Development	3.0
IDM 211	User Interface Design I	3.0
IDM 221	Web Design I	3.0
MKTG 322	Advertising & Integrated Marketing Communications	4.0
VSST 110	Introductory Drawing	3.0
One Digital Media (ANIM, GMAP, WBDV) elective		3.0
Digital Media track students also select one course from the following:		3.0
ANIM 220	Digital Compositing I	
DIGM 350 [WI]	Digital Storytelling	
DIGM 451 [WI]	Explorations in New Media	
IDM 222	Web Design II	
Total Credits		46.0

2. Cinema and Television Concentration

COM 111	Principles of Communication	3.0
COM 240	New Technologies In Communication	3.0
COM 270 [WI]	Business Communication	3.0
EAM 365	Media and Entertainment Business	3.0
FMTV 110	Basic Cinematography	3.0
FMTV 115	Basic Editing	3.0
FMTV 120	Basic Sound	3.0
FMTV 285	Media Law and Ethics	3.0
MKTG 322	Advertising & Integrated Marketing Communications	4.0
SCRP 270 [WI]	Screenwriting I	3.0
Select four from the following:		12.0
FMTV 130	Basic TV Studio	
FMTV 211	Intermediate Lighting	
FMTV 215	Intermediate Editing	
FMTV 230	Intermediate TV Studio	
FMTV 355	DNews	
FMTV T180	Special Topics in Film & TV	
FMTV T280	Special Topics in Film & TV	
FMTV T380	Special Topics in Film & TV	
FMTV T480	Special Topics in Film & TV	
FMVD 305	Special Effects Make-up	
FMVD T180	Special Topics in Game Film & Video	
FMVD T280	Special Topics in Game Film & Video	
FMVD T380	Special Topics in Game Film & Video	
FMVD T480	Special Topics in Game Film & Video	
SCRP 241	Writing TV Comedy	
SCRP 242	Writing TV Drama	
SCRP 275 [WI]	Screenwriting II	
SCRP 280 [WI]	Writing the Short Film	
SCRP 310	Literature for Screenwriters	
SCRP 370	Screenplay Story Development	
SCRP 380	Screenwriting Workshop I	
SCRP 381	Screenwriting Workshop II	
TVIE 280	Research, Sales and Programming	
TVPR 210	TV Studio: Narrative	
TVPR 230	Scripted TV Production	
TVPR 236	Reality TV Production	
TVPR 357	DNews II	
Choose 1 of 2 from the following:		3.0
FMTV 280	Basic Producing	
TVPR 240	Producing for Television	
Total Credits		46.0

D. Sports Entertainment

COM 111	Principles of Communication	3.0
COM 270 [WI]	Business Communication	3.0
EAM 365	Media and Entertainment Business	3.0
FMVD 110	Basic Shooting and Lighting	3.0
or FMTV 110	Basic Cinematography	
FMVD 115	Basic Editing	3.0
or FMTV 115	Basic Editing	
FMVD 120	Basic Sound	3.0
or FMTV 120	Basic Sound	
SMT 110	The Business of Sport	4.0
SMT 201	Sports Marketing, Promotion, and Public Relations	4.0
SMT 205	Sport Media Relations	4.0
SMT 215	Sports Ticket Sales & Operations	3.0
TVPR 100	TV Studio: Basic Operations	3.0
or FMTV 130	Basic TV Studio	
TVPR 240	Producing for Television	3.0
TVIE 250	TV Sports Program Strategies	3.0
Sport Entertainment Concentration students also select any two of the following courses:		6.0
SMT 200	Introduction to Sport Facility and Event Management	
SMT 225	Sports Budgeting	
SMT 230	Sports and the Law	
SMT 240	Olympic Games	
SMT 260	Sports Agents & Labor Relations	
SMT 305	Fundraising in Sports	
SMT 307	Corporate Sponsorship in Sports	
SMT 309	Capital Campaigns in Athletics	
SMT 310	Sports Contracts	
SMT 315	Sports Publications & Graphics	
SMT 320	Sport Economics	
SMT 337	Risk Management in Sports	
SMT 345	Fan Experience Management	
SMT 347	Sport Tourism	
TVPR 200	TV Studio: Live Directing	
or FMTV 230	Intermediate TV Studio	
TVST 260	History of Television	
or TVST 10	TV History	
Total Credits		48.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses

with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plans of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

At the end of their freshman year, students select one of the following concentrations. Each concentration has its own unique Plan of Study:

(A) Visual Arts Management Concentration

Term 1		Credits
EAM 130	Overview of Entertainment and Arts Management	3.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	15.0
Term 2		
ACCT 110	Accounting for Professionals	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
UNIV A101	The Drexel Experience	1.0
Free Elective		3.0
	Term Credits	15.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
EAM 211	Strategic Management for Entertainment and Arts Management	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
Arts and Humanities elective		3.0
Social science elective		3.0
Free Elective		3.0
	Term Credits	16.0
Term 4		
BLAW 201	Business Law I	4.0
COOP 101	Career Management and Professional Development	0.0
DSMR 100	Computer Imaging I	3.0
EAM 391 [WI]	Entertainment Promotion and Branding	3.0
Social science elective		3.0
PHYS 170	Electricity and Motion	3.0
PHYS 171	Computational Lab for Electricity and Motion	1.0
	Term Credits	17.0
Term 5		
EAM 261	Copyrights and Trademarks	3.0
EAM 270	Audience Development for Arts	3.0
EAM 312	Introduction to Fund Development for the Arts	3.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
Visual Arts elective*		3.0
	Term Credits	16.0
Term 6		
COM 230	Techniques of Speaking	3.0
EAM 200	Introduction to the Music Industry	3.0
EAM 361	Law for Entertainment and Arts Management Managers	3.0
TVIE 290	Introduction to Money and the Media	3.0

Social science elective		3.0
Visual Arts elective*		3.0
	Term Credits	18.0
Term 7		
ARTH 101	History of Art I: Ancient to Medieval	3.0
EAM 301	Gallery and Collection Management	3.0
EAM 401 [WI]	Writing for Arts Managers	3.0
Business elective*		4.0
Free elective*		3.0
	Term Credits	16.0
Term 8		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
EAM 302	Exhibition Design	3.0
MKTG 201	Introduction to Marketing Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
Visual Arts elective*		3.0
	Term Credits	17.0
Term 9		
ARTH 103	History of Art III: Modern Art	3.0
EAM 340	Artist Representation and Management	3.0
EAM 350	Arts, Culture and Society	3.0
Visual Arts elective*		3.0
Business elective*		4.0
	Term Credits	16.0
Term 10		
EAM 471	Fine Arts Market Development	3.0
EAM 491	Entertainment and Arts Management Senior Project	1.0
HRMT 323	Principles of Human Resource Administration	4.0
Free elective		3.0
Visual Arts elective*		3.0
	Term Credits	14.0
Term 11		
EAM 472	Trends in Visual Arts	3.0
EAM 491	Entertainment and Arts Management Senior Project	1.0
Arts and Humanities Elective		3.0
Free elective		3.0
Visual Arts elective*		3.0
	Term Credits	13.0
Term 12		
EAM 491	Entertainment and Arts Management Senior Project	1.0
Business elective*		4.0
Free elective		6.0
Visual Arts elective*		3.0
	Term Credits	14.0

Total Credit: 187.0

(B) Performing Arts Management
(1.) Dance Concentration

Term 1		Credits
EAM 130	Overview of Entertainment and Arts Management	3.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	15.0
Term 2		
ACCT 110	Accounting for Professionals	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0

MATH 102	Introduction to Analysis II	4.0
UNIV A101	The Drexel Experience	1.0
Free elective		3.0
	Term Credits	15.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
EAM 211	Strategic Management for Entertainment and Arts Management	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
Arts and Humanities elective		3.0
Social science elective		3.0
Free elective		3.0
	Term Credits	16.0
Term 4		
BLAW 201	Business Law I	4.0
COOP 101	Career Management and Professional Development	0.0
DSMR 100	Computer Imaging I	3.0
EAM 391 [WI]	Entertainment Promotion and Branding	3.0
PHYS 170	Electricity and Motion	3.0
PHYS 171	Computational Lab for Electricity and Motion	1.0
Social science elective		3.0
	Term Credits	17.0
Term 5		
EAM 261	Copyrights and Trademarks	3.0
EAM 270	Audience Development for Arts	3.0
EAM 312	Introduction to Fund Development for the Arts	3.0
THTR 240	Theatre Production I	3.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
	Term Credits	16.0
Term 6		
COM 230	Techniques of Speaking	3.0
DANC 115	Introduction to Dance	3.0
EAM 200	Introduction to the Music Industry	3.0
EAM 313	Volunteer and Board Management	3.0
EAM 361	Law for Entertainment and Arts Management Managers	3.0
TVIE 290	Introduction to Money and the Media	3.0
Required ensemble		0.0
	Term Credits	18.0
Term 7		
DANC 104	Ballet Technique I	2.0
DANC 105	Modern Dance Technique I	2.0
DANC 106 or 107	Jazz Dance Technique I Hip-Hop Dance Technique I	2.0
EAM 321	Box Office and Venue Management	3.0
EAM 401 [WI]	Writing for Arts Managers	3.0
MUSC 130	Introduction to Music	3.0
Required ensemble		1.0
	Term Credits	16.0
Term 8		
DANC 135	Rhythmic Study for Dance	3.0
EAM 322	Performing Arts Touring	3.0
MKTG 201	Introduction to Marketing Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
Arts and Humanities Elective		3.0
	Term Credits	17.0
Term 9		
DANC 215	Dance Appreciation	3.0
EAM 340	Artist Representation and Management	3.0
EAM 350	Arts, Culture and Society	3.0
Business elective*		4.0
Free Elective		3.0
Required ensemble		1.0
	Term Credits	17.0
Term 10		
DANC 315	Twentieth Century Dance	3.0
EAM 491	Entertainment and Arts Management Senior Project	1.0
HRMT 323	Principles of Human Resource Administration	4.0
Free elective		3.0
Ensemble		1.0
	Term Credits	12.0
Term 11		
DANC 235	Dance Composition I	3.0
EAM 491	Entertainment and Arts Management Senior Project	1.0
Free elective		6.0
Business elective		4.0
Ensemble		0.0
	Term Credits	14.0
Term 12		
EAM 325	Producing for Live Entertainment	3.0
EAM 491	Entertainment and Arts Management Senior Project	1.0
Free electives		6.0
Business elective*		4.0
Ensemble		0.0
	Term Credits	14.0

Total Credit: 187.0

(2.) Performing Arts Concentration

Term 1		Credits
EAM 130	Overview of Entertainment and Arts Management	3.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	15.0
Term 2		
ACCT 110	Accounting for Professionals	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
UNIV A101	The Drexel Experience	1.0
Free elective		3.0
	Term Credits	15.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
EAM 211	Strategic Management for Entertainment and Arts Management	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
Arts and Humanities elective		3.0
Free elective		3.0
Social science elective		3.0
	Term Credits	16.0
Term 4		
BLAW 201	Business Law I	4.0
COOP 101	Career Management and Professional Development	0.0
DSMR 100	Computer Imaging I	3.0
EAM 391 [WI]	Entertainment Promotion and Branding	3.0
THTR 130	Introduction to Theater Production Practicum	1.0
THTR 240	Theatre Production I	3.0
PHYS 170	Electricity and Motion	3.0
PHYS 171	Computational Lab for Electricity and Motion	1.0
	Term Credits	18.0

Term 5

EAM 261	Copyrights and Trademarks	3.0
EAM 270	Audience Development for Arts	3.0
EAM 312	Introduction to Fund Development for the Arts	3.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
Social science elective		3.0
	Term Credits	16.0

Term 6

COM 230	Techniques of Speaking	3.0
DANC 215	Dance Appreciation	3.0
EAM 200	Introduction to the Music Industry	3.0
EAM 313	Volunteer and Board Management	3.0
EAM 361	Law for Entertainment and Arts Management Managers	3.0
TVIE 290	Introduction to Money and the Media	3.0
Required ensemble		0.0
	Term Credits	18.0

Term 7

EAM 321	Box Office and Venue Management	3.0
EAM 401 [WI]	Writing for Arts Managers	3.0
MUSC 130	Introduction to Music	3.0
THTR 115	Theatrical Experience	3.0
THTR 210	Acting: Fundamentals	3.0
Required ensemble		0.0
	Term Credits	15.0

Term 8

EAM 322	Performing Arts Touring	3.0
MKTG 201	Introduction to Marketing Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
MUSC elective		3.0
Required ensemble		1.0
	Term Credits	15.0

Term 9

DANC 115	Introduction to Dance	3.0
EAM 340	Artist Representation and Management	3.0
EAM 350	Arts, Culture and Society	3.0
Free elective		3.0
MUSC elective		3.0
Required ensemble		0.0
	Term Credits	15.0

Term 10

DANC 315	Twentieth Century Dance	3.0
EAM 491	Entertainment and Arts Management Senior Project	1.0
HRMT 323	Principles of Human Resource Administration	4.0
Business elective*		4.0
Arts and Humanities elective		3.0
Ensemble		0.0
	Term Credits	15.0

Term 11

EAM 491	Entertainment and Arts Management Senior Project	1.0
Business elective		4.0
Free elective		9.0
Ensemble		1.0
	Term Credits	15.0

Term 12

EAM 325	Producing for Live Entertainment	3.0
EAM 491	Entertainment and Arts Management Senior Project	1.0
Free elective		3.0
Business elective*		4.0

Social science elective		3.0
	Term Credits	14.0

Total Credit: 187.0

(3.) Theatre Concentration

Term 1		**Credits**
EAM 130	Overview of Entertainment and Arts Management	3.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	15.0

Term 2		
ACCT 110	Accounting for Professionals	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
UNIV A101	The Drexel Experience	1.0
Free elective		3.0
	Term Credits	15.0

Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
EAM 211	Strategic Management for Entertainment and Arts Management	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
Arts and Humanities elective		3.0
Free elective		3.0
Social science elective		3.0
	Term Credits	16.0

Term 4		
BLAW 201	Business Law I	4.0
COOP 101	Career Management and Professional Development	0.0
DSMR 100	Computer Imaging I	3.0
EAM 391 [WI]	Entertainment Promotion and Branding	3.0
THTR 130	Introduction to Theater Production Practicum	1.0
THTR 240	Theatre Production I	3.0
PHYS 170	Electricity and Motion	3.0
PHYS 171	Computational Lab for Electricity and Motion	1.0
	Term Credits	18.0

Term 5		
EAM 261	Copyrights and Trademarks	3.0
EAM 270	Audience Development for Arts	3.0
EAM 312	Introduction to Fund Development for the Arts	3.0
THTR 221 [WI]	Theatre History I	3.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
	Term Credits	16.0

Term 6		
COM 230	Techniques of Speaking	3.0
EAM 200	Introduction to the Music Industry	3.0
EAM 313	Volunteer and Board Management	3.0
EAM 361	Law for Entertainment and Arts Management Managers	3.0
THTR 121 [WI]	Dramatic Analysis	3.0
TVIE 290	Introduction to Money and the Media	3.0
Required ensemble		0.0
	Term Credits	18.0

Term 7		
EAM 321	Box Office and Venue Management	3.0
EAM 401 [WI]	Writing for Arts Managers	3.0
THTR 210	Acting: Fundamentals	3.0

Business elective[*]		4.0
Theatre elective		3.0
Required ensemble		1.0
	Term Credits	17.0
Term 8		
EAM 322	Performing Arts Touring	3.0
MKTG 201	Introduction to Marketing Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
Arts and Humanities elective		3.0
Required ensemble		1.0
	Term Credits	15.0
Term 9		
EAM 340	Artist Representation and Management	3.0
EAM 350	Arts, Culture and Society	3.0
THTR 211	Acting: Scene Study	2.0
THTR 222 [WI]	Theatre History II	3.0
Business elective[*]		4.0
Required ensemble		1.0
	Term Credits	16.0
Term 10		
EAM 491	Entertainment and Arts Management Senior Project	1.0
HRMT 323	Principles of Human Resource Administration	4.0
THTR 320	Play Direction	3.0
Business Elective		4.0
Ensemble		0.0
Free elective		3.0
	Term Credits	15.0
Term 11		
EAM 491	Entertainment and Arts Management Senior Project	1.0
THTR 260	Production Design	3.0
Free elective		6.0
Ensemble		0.0
Social science elective		3.0
	Term Credits	13.0
Term 12		
EAM 325	Producing for Live Entertainment	3.0
EAM 491	Entertainment and Arts Management Senior Project	1.0
Free elective		6.0
Theatre elective		3.0
	Term Credits	13.0

Total Credit: 187.0

(C) Media Management

(1.) Digital Media Concentration

Term 1		Credits
EAM 130	Overview of Entertainment and Arts Management	3.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	15.0
Term 2		
ACCT 110	Accounting for Professionals	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
UNIV A101	The Drexel Experience	1.0
Free elective		3.0
	Term Credits	15.0

Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
EAM 211	Strategic Management for Entertainment and Arts Management	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
Free elective		3.0
Social science elective		3.0
Arts and Humanities elective		3.0
	Term Credits	16.0
Term 4		
BLAW 201	Business Law I	4.0
COOP 101	Career Management and Professional Development	0.0
DIGM 105	Overview of Digital Media	3.0
DSMR 100	Computer Imaging I	3.0
PHYS 170	Electricity and Motion	3.0
PHYS 171	Computational Lab for Electricity and Motion	1.0
VSST 110	Introductory Drawing	3.0
	Term Credits	17.0
Term 5		
ANIM 140	Computer Graphics Imagery I	3.0
EAM 261	Copyrights and Trademarks	3.0
EAM 312	Introduction to Fund Development for the Arts	3.0
EAM 391 [WI]	Entertainment Promotion and Branding	3.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
	Term Credits	16.0
Term 6		
COM 230	Techniques of Speaking	3.0
EAM 200	Introduction to the Music Industry	3.0
EAM 361	Law for Entertainment and Arts Management Managers	3.0
IDM 100	Introduction to Web Development	3.0
TVIE 290	Introduction to Money and the Media	3.0
	Term Credits	15.0
Term 7		
COM 111	Principles of Communication	3.0
EAM 365	Media and Entertainment Business	3.0
FMTV 110	Basic Cinematography	3.0
IDM 211	User Interface Design I	3.0
Arts and Humanities elective		3.0
	Term Credits	15.0
Term 8		
COM 240	New Technologies In Communication	3.0
MKTG 201	Introduction to Marketing Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
IDM 221	Web Design I	3.0
GMAP 260	Overview of Computer Gaming	3.0
	Term Credits	17.0
Term 9		
EAM 340	Artist Representation and Management	3.0
EAM 350	Arts, Culture and Society	3.0
MKTG 322	Advertising & Integrated Marketing Communications	4.0
ANIM, GMAP or IDM elective		3.0
Business elective[*]		4.0
	Term Credits	17.0
Term 10		
COM 270 [WI]	Business Communication	3.0
EAM 491	Entertainment and Arts Management Senior Project	1.0
HRMT 323	Principles of Human Resource Administration	4.0
Free elective		3.0
Business elective		4.0
	Term Credits	15.0
Term 11		

EAM 491	Entertainment and Arts Management Senior Project	1.0
ANIM, GMAP or IDM elective		3.0
Free electives		6.0
Social science elective		3.0
	Term Credits	13.0
Term 12		
EAM 491	Entertainment and Arts Management Senior Project	1.0
Business elective[*]		4.0
Social science elective		3.0
Free electives		6.0
	Term Credits	14.0

Total Credit: 185.0

(2.) Cinema and Television Concentration

Term 1		**Credits**
EAM 130	Overview of Entertainment and Arts Management	3.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	15.0
Term 2		
ACCT 110	Accounting for Professionals	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
UNIV A101	The Drexel Experience	1.0
Free elective		3.0
	Term Credits	15.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
EAM 211	Strategic Management for Entertainment and Arts Management	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
Free elective		3.0
Arts and Humanities elective		3.0
Social science elective		3.0
	Term Credits	16.0
Term 4		
BLAW 201	Business Law I	4.0
COOP 101	Career Management and Professional Development	0.0
DSMR 100	Computer Imaging I	3.0
EAM 391 [WI]	Entertainment Promotion and Branding	3.0
FMTV 120	Basic Sound	3.0
PHYS 170	Electricity and Motion	3.0
PHYS 171	Computational Lab for Electricity and Motion	1.0
	Term Credits	17.0
Term 5		
COM 111	Principles of Communication	3.0
EAM 261	Copyrights and Trademarks	3.0
EAM 312	Introduction to Fund Development for the Arts	3.0
FMTV 110	Basic Cinematography	3.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
	Term Credits	16.0
Term 6		
COM 230	Techniques of Speaking	3.0
EAM 200	Introduction to the Music Industry	3.0
EAM 361	Law for Entertainment and Arts Management Managers	3.0
FMTV 115	Basic Editing	3.0

TVIE 290	Introduction to Money and the Media	3.0
Arts and Humanities elective		3.0
	Term Credits	18.0
Term 7		
EAM 365	Media and Entertainment Business	3.0
SCRP 270 [WI]	Screenwriting I	3.0
Business elective[*]		4.0
Cinema and Television elective[*]		3.0
Free Elective		3.0
	Term Credits	16.0
Term 8		
FMTV 280	Basic Producing	3.0
FMTV 285	Media Law and Ethics	3.0
MKTG 201	Introduction to Marketing Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
Cinema & Television elective		3.0
	Term Credits	17.0
Term 9		
COM 240	New Technologies In Communication	3.0
EAM 340	Artist Representation and Management	3.0
EAM 350	Arts, Culture and Society	3.0
MKTG 322	Advertising & Integrated Marketing Communications	4.0
Cinema and Television elective[*]		3.0
	Term Credits	16.0
Term 10		
COM 270 [WI]	Business Communication	3.0
EAM 491	Entertainment and Arts Management Senior Project	1.0
HRMT 323	Principles of Human Resource Administration	4.0
Business elective		4.0
	Term Credits	12.0
Term 11		
EAM 491	Entertainment and Arts Management Senior Project	1.0
Cinema and Television elective[*]		3.0
Social science elective		3.0
Free electives		6.0
	Term Credits	13.0
Term 12		
EAM 491	Entertainment and Arts Management Senior Project	1.0
Business elective[*]		4.0
Social science elective		3.0
Free electives		6.0
	Term Credits	14.0

Total Credit: 185.0

(D.) Sports Entertainment Concentration

Term 1		**Credits**
EAM 130	Overview of Entertainment and Arts Management	3.0
ECON 201	Principles of Microeconomics	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	15.0
Term 2		
ACCT 110	Accounting for Professionals	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 102	Introduction to Analysis II	4.0
UNIV A101	The Drexel Experience	1.0

Free elective		3.0
	Term Credits	15.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
EAM 211	Strategic Management for Entertainment and Arts Management	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
Free elective		3.0
Arts and Humanities elective		3.0
Social science elective		3.0
	Term Credits	16.0
Term 4		
BLAW 201	Business Law I	4.0
COM 111	Principles of Communication	3.0
COOP 101	Career Management and Professional Development	0.0
DSMR 100	Computer Imaging I	3.0
PHYS 170	Electricity and Motion	3.0
PHYS 171	Computational Lab for Electricity and Motion	1.0
SMT 110	The Business of Sport	4.0
	Term Credits	18.0
Term 5		
EAM 261	Copyrights and Trademarks	3.0
EAM 312	Introduction to Fund Development for the Arts	3.0
EAM 391 [WI]	Entertainment Promotion and Branding	3.0
FMTV 130	Basic TV Studio	3.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
	Term Credits	16.0
Term 6		
COM 230	Techniques of Speaking	3.0
EAM 200	Introduction to the Music Industry	3.0
EAM 361	Law for Entertainment and Arts Management Managers	3.0
FMTV 110	Basic Cinematography	3.0
TVIE 290	Introduction to Money and the Media	3.0
	Term Credits	15.0
Term 7		
EAM 365	Media and Entertainment Business	3.0
FMTV 115	Basic Editing	3.0
SMT 201	Sports Marketing, Promotion, and Public Relations	4.0
SMT 205	Sport Media Relations	4.0
Free elective		3.0
	Term Credits	17.0
Term 8		
MKTG 201	Introduction to Marketing Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
TVIE 250	TV Sports Program Strategies	3.0
TVPR 240	Producing for Television	3.0
	Term Credits	14.0
Term 9		
EAM 340	Artist Representation and Management	3.0
EAM 350	Arts, Culture and Society	3.0
FMTV 120[3]	Basic Sound	3.0
Arts and Humanities elective		3.0
Sports Entertainment elective		3.0
	Term Credits	15.0
Term 10		
COM 270 [WI]	Business Communication	3.0
EAM 491	Entertainment and Arts Management Senior Project	1.0
HRMT 323	Principles of Human Resource Administration	4.0
SMT 215	Sports Ticket Sales & Operations	3.0
Business elective		4.0

Free elective		3.0
	Term Credits	18.0
Term 11		
EAM 491	Entertainment and Arts Management Senior Project	1.0
Business elective		4.0
Free elective		3.0
Social science elective		3.0
Sports Entertainment elective		3.0
	Term Credits	14.0
Term 12		
EAM 491	Entertainment and Arts Management Senior Project	1.0
Business elective		4.0
Free electives		6.0
Social science elective		3.0
	Term Credits	14.0

Total Credit: 187.0

*

Co-op/Career Opportunities

Entertainment & Arts Management prepares students for a variety of careers in both commercial and nonprofit organizations - from creative, hands-on positions to administrative and management roles.

The career possibilities in this field are extensive and include the following positions:

- Artistic or Creative Director
- Concert and Live Events Manager
- Gallery Owner or Museum Manager
- Special Events Planner
- Marketing or Social Media Director
- Film or TV Producer
- Venue Manager
- Artist Representative - Agent, Manager, or Publicist
- Creative Content Director - Media, TV or Online

Examples of Past Co-op Jobs

EAM students work at many of the leading entertainment and arts companies in the country.

Examples of some of the co-op employers where EAM students have worked:

- Showtime
- A&E Network
- Live Nation - Midwest, Philadelphia, New York
- AEG Live - Los Angeles
- The Tonight Show Starring Jimmy Fallon
- Atlantic Records
- Sony Music Entertainment
- Disney
- Comcast
- NBC Universal - NYC
- The Onion
- Screen Actors Guild
- Sirius/XM Radio
- Abrams Artist Agency – NYC

- Red Light Management - NYC
- Fox News Channel
- Warner Music Group
- Nashville Casting
- Rain Management Group
- The Trocadero
- XFINITY Live! Philadelphia
- Asbury Lanes
- Cosi Television NY
- World Café Live!
- Kimmel Center for the Performing Arts
- Lincoln Center for the Performing Arts
- Sesame Workshop
- Upright Citizens Brigade
- Edinburgh Fringe Festival
- Webster Hall NYC
- Philadelphia Theatre Company
- Joffrey Ballet
- Pennsylvania Ballet
- Arden Theatre Company

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

About the Accelerated Degree Program (BS/MBA)

Available to students majoring in entertainment and arts management (4-year with co-op), this dual degree program combines study in the management of the arts and entertainment industries along with the MBA degree. The program is designed to allow students to complete both the bachelor's degree and the Master of Business Administration degree in five years.

Incoming freshmen selected for this program will generally have a minimum of 1350 on the SAT, a GPA of 3.5 or better, and rank in the top 10% of their high school graduating class. A strong candidate for this program will have taken significant AP coursework while in high school.

Degree requirements

BS in Entertainment & Arts Management (p. 518)

MBA Requirements (http://catalog.drexel.edu/graduate/collegeofbusiness/businessadministration/#degreerequirementstext)

BS/MBA students may be waived from three MBA Enterprise Management courses, assuming a grade of B or better is earned in specified undergraduate courses. Students can review the Waiver Policies for the Statement of Curriculum Standing on the LeBow College's web site for additional information. Students who complete MIS 200 in their undergraduate program will, in addition, be waived from a fourth MBA course (MIS 612).

The above conditions hold only for fully accepted BS/MBA students as identified by Enrollment Management.

Additional requirements for the dual degree program

- A cumulative GPA of at least 3.2 is required throughout the program.
- Students must take the GMAT examination and achieve a minimum score of 570 prior to the end of the tenth term in order to continue in the program. It is recommended that students take the GMAT examination late in the student's third year.
- Students must submit an acceptable of plan of study at least three terms before anticipated start of graduate part of the program.

Students should visit the Westphal College of Media Arts and Design (http://www.drexel.edu/undergrad/academics/colleges-schools/westphal/) for more information.

College of Media Arts and Design Facilities

Our college offers high-quality facilities and resources to its students including a state-of-the-art black-box theatre, HD film screening rooms, rehearsal studios, event venues, and more. The following are some links for more information about some of our facilities.

- Robert and Penny Fox Historic Costume Collection (http://www.drexel.edu/westphal/resources/FHCC/)
- Design and Imaging Studios (http://www.drexel.edu/westphal/student-resources/technology/)
- DUTV (http://www.dutv.org/), (Paul F. Harron Studios) student-run cable television station
- Leonard Pearlstein Gallery (http://www.drexel.edu/westphal/resources/LeonardPearlsteinGallery/)
- MAD Dragon Media Group (http://maddragonrecords.com/)
- Mandell Theater (http://www.drexel.edu/performingarts/about/facilities/mandell-theater/)
- Rudman Institute for Entertainment Industry Studies (http://www.drexel.edu/westphal/resources/Rudman/)
- WKDU (http://www.wkdu.org/), Drexel's student-run radio station

Entertainment and Arts Management Faculty

Rick Dorfman Adjunct Instructor. Artist representation.

Julie Hawkins, MFA *(Temple University) Program Director, MS in Arts Administration.* Assistant Professor. Cultural policy, political activism in the arts, changes in economic and social policy, arts sector changes.

Brian Moore, MS, MFA *(Drexel University; Louisiana State University) Program Director, BS in Entertainment and Arts Management.* Assistant Teaching Professor. Commercial entertainment: film, theatre, television. Nonprofit organizations: theatre, general fund development; strategic planning; communications and marketing; executive management.

Amy Scheidegger, MS *(Drexel University).* Adjunct Instructor. Working artist teaching audience development, advocacy and strategic management. Creator of the Artistic Rebuttal Book Project

Scott Schwartz, JD *(University of Buffalo).* Adjunct Professor. General counsel at Dansko, LLC; teaches Copyright & Trademarks.

Neville Vakharia, MS *(Drexel University) Program & Research Director, Arts Administration & Museum Leadership; Interim Associate Dean of Research.* Assistant Professor. Technology in the arts, strategic

planning and evaluation, management and leadership, innovation and entrepreneurship.

David Weiss Adjunct Instructor. VP at Freeman's Auction House, Host of Antiques Roadshow on PBC; Teaches Fine Art Market Development

Brannon Wiles, JD *(Columbia University School of Law)*. Assistant Professor. Producing for commercial theatre, law and the arts, contract negotiation, labor relations, budgeting and company management.

Justin Wineburgh, JD *(Widener University)*. Adjunct Professor. Teaching Law for Entertainment and Arts Management. CEO of Alkemy-X production company.

Emeritus Faculty

Lawrence Epstein, MBA *(Cornell University)*. Teaching Professor. Media Finance, Station Group Management Media Analytics, Financial, Technical and Strategic Planning. Technology Assessment and Management, New Venture Management

Fashion Design

Major: Fashion Design
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 183.0
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 50.0407
Standard Occupational Classification (SOC) code: 27-1022

About the Program

The Fashion Design Program at Drexel University's Antoinette Westphal College (http://www.drexel.edu/westphal/undergraduate/FASH/) of Media Arts & Design educates and trains visionary designers to use an integrated approach toward the creation of contemporary fashion within the context of an expanding, yet converging global economy and society. Through a series of courses offered freshman year, fashion students will explore the challenges facing our industry and learn how to implement sustainable solutions in their design process. The fusion of art, design, science and technology serves as a springboard for the production of unique apparel for the 21st century, and represents a trans-disciplinary approach that requires flexibility and focus. Over the past two decades, Drexel's Fashion Design program has developed a stellar, international reputation and is ranked in the top four nationally and 14th worldwide. That is due in part, to a passionate and experienced faculty, novel approaches to pedagogy, and participation in national and international competitions. Faculty and alumni connections to industry leaders strongly augment and catalyze the program, the strength of which is closely linked to the philosophy that each student has a distinct vision and a unique aesthetic that must be cultivated on an individual basis.

Students have 24 hour access to state-of-the-art studios including CAD pattern, CLO 3-D virtual garment simulation, Shima Seiki Apex-3 design technology and automated knitwear machines. The Shima Seiki knit lab features the latest equipment for the design, simulation and production of fully fashioned knitwear. Students can engage in collaborative University wide research through the use of the exCITe Center (http://drexel.edu/excite/) located next door and the Hybrid Making Lab (http://www.drexel.edu/westphal/resources/making_spaces/HybridMakingLab/) located on the URBN Center's first floor. They acquire detailed knowledge about industrial productions, advanced technologies in design, collaborative design, materials and processes, and the marketing and merchandising of clothing.

Accordingly, our future fashion designers, both undergraduates and graduates alike, develop an intuitive and practical understanding of design through a fine arts foundation, while studying the psychological, social and historical contexts of fashion through the world-renowned Robert and Penny Fox Historic Costume Collection (http://www.drexel.edu/foxcollection/) (FHCC). Importantly, the students are provided with commercial studio/ atelier training that goes hand-in-hand with classroom instruction through the University's cooperative education program (http://www.drexel.edu/westphal/forStudents/co-op/). Cooperative education offers invaluable opportunities for students to observe and participate in the fashion industry at the ground level. Critiques by visiting professionals are included in all upper level courses and provide valuable "real world" input, as well as future career connections. A large percentage of students spend a term studying abroad (http://www.drexel.edu/studyabroad/) in the world's great fashion capitals, including London (https://studyabroad.drexel.edu/?FuseAction=Programs.ViewProgram&Program_ID=10070&Type=O&sType=O), England and Florence (https://studyabroad.drexel.edu/?FuseAction=Programs.ViewProgram&Program_ID=40220), Italy. Students can also choose from a range of Intensive Courses Abroad (ICA) such as Drexel Fashion Break in South Korea: Korean Fashion Industry (https://studyabroad.drexel.edu/?FuseAction=Programs.ViewProgram&Program_ID=47802). Upon graduation, students show their collections (http://www.drexel.edu/westphal/creative/fash/) in the annual fashion show.

For more information about this major, visit the College's Fashion Design (http://drexel.edu/westphal/academics/undergraduate/FASH/) page.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General education requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
ENVS 160	Environment in the News	2.0
ENVS 260	Environmental Science and Society	3.0
GEO 111	Natural Disasters	3.0
MATH 119	Mathematical Foundations for Design	4.0
UNIV A101	The Drexel Experience	2.0
Required Arts and humanities-students elect a minimum of 9.0 credits		9.0
Required Social science-students elect a minimum of 9.0 credits		9.0
Free electives		24.0
Visual studies requirements		
ARTH 101	History of Art I: Ancient to Medieval	3.0
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ARTH 103	History of Art III: Modern Art	3.0
VSST 101	Design I	4.0
VSST 102	Design II	4.0

VSST 103	Design III	4.0
VSST 110	Introductory Drawing	3.0
VSST 111	Figure Drawing I	3.0
VSST 113	Figure Drawing for Fashion	3.0
VSST 301	Painting I	4.0
VSST 304	Materials Exploration	4.0
Select one of the following Multimedia courses:		4.0
VSST 201	Multimedia: Performance	
VSST 202	Multimedia: Space	
VSST 203	Multimedia: Materials	
Fashion design requirements		
ARTH 335 [WI]	History of Costume I: Preclassical to Directoire	3.0
ARTH 336 [WI]	History of Costume II: Directoire to World War I	3.0
FASH 201	Survey of the Fashion Industry	3.0
FASH 211	Fashion Drawing I	3.0
FASH 212	Fashion Drawing II	3.0
FASH 230	Textiles for Fashion Design	3.0
FASH 241	Construction Skills	4.0
FASH 310	Presentation Techniques	3.0
FASH 311	Textile Design	3.0
FASH 313	Fashion Drawing for Industry	3.0
FASH 314	Fashion Presentation Drawing	3.0
FASH 315	Computer Aided Design for Patternmaking	3.0
or FASH 316	Computer Aided Design for Fashion Design	
FASH 341	Flat Pattern Design	4.0
FASH 342	Draping Design	4.0
FASH 343	Tailoring	4.0
FASH 349	Fashion Design I	4.0
FASH 350	Fashion Design II	4.0
FASH 351	Fashion Design III	4.0
FASH 352	Fashion Design IV	4.0
FASH 464	Professional Portfolio	3.0
FASH 491	Collection I	4.0
FASH 492	Collection II	3.0
Total Credits		183.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plans of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Standard Plan

(See below for Study Abroad plan of study)

Term 1		Credits
ENVS 260	Environmental Science and Society	3.0
FASH 201	Survey of the Fashion Industry	3.0
UNIV A101	The Drexel Experience	1.0
VSST 101	Design I	4.0
VSST 110	Introductory Drawing	3.0
	Term Credits	14.0
Term 2		
FASH 241	Construction Skills	4.0
GEO 111	Natural Disasters	3.0
UNIV A101	The Drexel Experience	1.0
VSST 102	Design II	4.0
VSST 111	Figure Drawing I	3.0
	Term Credits	15.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
ENVS 160	Environment in the News	2.0
FASH 341	Flat Pattern Design	4.0
MATH 119	Mathematical Foundations for Design	4.0
VSST 103	Design III	4.0
VSST 113	Figure Drawing for Fashion	3.0
	Term Credits	18.0
Term 4		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
FASH 211	Fashion Drawing I	3.0
FASH 310	Presentation Techniques	3.0
FASH 342	Draping Design	4.0
VSST 304	Materials Exploration	4.0
	Term Credits	17.0
Term 5		
ARTH 101	History of Art I: Ancient to Medieval	3.0
COOP 101	Career Management and Professional Development	0.0
FASH 212	Fashion Drawing II	3.0
FASH 230	Textiles for Fashion Design	3.0
FASH 311	Textile Design	3.0
FASH 349	Fashion Design I	4.0
	Term Credits	16.0
Term 6		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
FASH 313	Fashion Drawing for Industry	3.0
FASH 350	Fashion Design II	4.0
Free elective		3.0
	Term Credits	16.0
Term 7		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
VSST 301	Painting I	4.0
Select one of the following:		4.0

VSST 201	Multimedia: Performance	
VSST 203	Multimedia: Materials	
VSST 202	Multimedia: Space	
Social science elective		3.0
	Term Credits	14.0
Term 8		
ARTH 103	History of Art III: Modern Art	3.0
ARTH 335 [WI]	History of Costume I: Preclassical to Directoire	3.0
FASH 315	Computer Aided Design for Patternmaking (or elective)	3.0
FASH 343	Tailoring	4.0
Arts and Humanities elective		3.0
	Term Credits	16.0
Term 9		
ARTH 336 [WI]	History of Costume II: Directoire to World War I	3.0
FASH 314	Fashion Presentation Drawing	3.0
FASH 351	Fashion Design III	4.0
Arts and Humanities elective		3.0
	Term Credits	13.0
Term 10		
FASH 352	Fashion Design IV	4.0
FASH 464	Professional Portfolio	3.0
Free elective		3.0
Arts and Humanities elective		3.0
Social science elective		3.0
	Term Credits	16.0
Term 11		
FASH 316	Computer Aided Design for Fashion Design (or elective)	3.0
FASH 491	Collection I	4.0
Free elective		3.0
Social science elective		3.0
	Term Credits	13.0
Term 12		
FASH 492	Collection II	3.0
Free electives		12.0
	Term Credits	15.0

Total Credit: 183.0

Study Abroad

Term 1		Credits
ENVS 260	Environmental Science and Society	3.0
FASH 201	Survey of the Fashion Industry	3.0
UNIV A101	The Drexel Experience	1.0
VSST 101	Design I	4.0
VSST 110	Introductory Drawing	3.0
	Term Credits	14.0
Term 2		
FASH 241	Construction Skills	4.0
GEO 111	Natural Disasters	3.0
UNIV A101	The Drexel Experience	1.0
VSST 102	Design II	4.0
VSST 111	Figure Drawing I	3.0
	Term Credits	15.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
ENVS 160	Environment in the News	2.0
FASH 341	Flat Pattern Design	4.0
MATH 119	Mathematical Foundations for Design	4.0
VSST 103	Design III	4.0
VSST 113	Figure Drawing for Fashion	3.0
	Term Credits	18.0
Term 4		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
FASH 211	Fashion Drawing I	3.0
FASH 310	Presentation Techniques	3.0
FASH 342	Draping Design	4.0
VSST 304	Materials Exploration	4.0
	Term Credits	17.0
Term 5		
ARTH 101	History of Art I: Ancient to Medieval	3.0
FASH 212	Fashion Drawing II	3.0
FASH 230	Textiles for Fashion Design	3.0
FASH 311	Textile Design	3.0
FASH 349	Fashion Design I	4.0
	Term Credits	16.0
Term 6		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
FASH 313	Fashion Drawing for Industry	3.0
FASH 350	Fashion Design II	4.0
Select one of the following:		4.0
VSST 201	Multimedia: Performance	
VSST 203	Multimedia: Materials	
VSST 202	Multimedia: Space	
COOP 101	Career Management and Professional Development	0.0
	Term Credits	17.0
Term 7		
Free elective		12.0
	Term Credits	12.0
Term 8		
ARTH 103	History of Art III: Modern Art	3.0
ARTH 335 [WI]	History of Costume I: Preclassical to Directoire	3.0
FASH 343	Tailoring	4.0
FASH 315	Computer Aided Design for Patternmaking (or elective)	3.0
Arts and Humanities elective		3.0
	Term Credits	16.0
Term 9		
ARTH 336 [WI]	History of Costume II: Directoire to World War I	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
FASH 314	Fashion Presentation Drawing	3.0
FASH 351	Fashion Design III	4.0
Arts and Humanities elective		3.0
	Term Credits	16.0
Term 10		
FASH 352	Fashion Design IV	4.0
FASH 464	Professional Portfolio	3.0
Social science elective		3.0
Arts and Humanities elective		3.0
Free elective		3.0
	Term Credits	16.0
Term 11		
FASH 491	Collection I	4.0
VSST 301	Painting I	4.0
FASH 316	Computer Aided Design for Fashion Design (or elective)	3.0
Social Science elective		3.0
	Term Credits	14.0
Term 12		
FASH 492	Collection II	3.0
Social science elective		3.0

Free elective	6.0
Term Credits	12.0

Total Credit: 183.0

Co-op/Career Opportunities

Drexel Co-op is a renowned collegiate program. Students spend a minimum of 6 months either in the US (http://www.drexel.edu/westphal/academics/co-op/) or abroad (http://www.drexel.edu/scdc/co-op/international/) where they can apply their skills in the challenging and exciting fashion industry. Areas of opportunity include garment design, concept design, product development, production, textile design, costume design, technical design, CAD, publishing, curatorial work, promotion and marketing. During the cooperative education program students apply their industry knowledge and gain experience in the diverse, fast paced global world of fashion. Students forge long lasting relationships with alumni and other industry professionals.

Co-op Experiences

Some past co-op employers of fashion design students include:

- A Wish Come True, Greater Philadelphia Area
- Abercrombie & Fitch, Ohio
- Alice & Olivia, New York
- Althea Harper, New York
- Amsale, New York
- Austin Scarlett, New York
- Australian Internships - Bec & Bridge
- Badgley Mischka, New York
- Beijing Yu Wen Hua Apparel Company
- BCBG Max Azria, California
- Bioko Biodiversity Protection Program, Equatorial Guinea
- Blazina International, Philadelphia
- Calvin Klein, New York
- Centric Brands, New York
- Charlotte Ronson, New York
- Chico's FAS, Inc., Ft. Meyers Fl
- Christian Soriano, New York
- Costume Design- brittany Ann Cormack, Santa Monica, CA
- Dennis Basso/Stallion Inc.,New York
- Derek Lam, New York
- Destination Maternity Corporation, Moorestown, NJ
- Dew E Dew Concept Company, South Korea
- DYLANLEX, Philadelphia, PA
- Elite Sportswear, L.P., Reading, PA
- Elie Tahari, New York
- Elixir Fashion Apparel & Alicia Lee Designs, China
- For Love and Lemons, Los Angeles, CA
- Gelmart International, New York
- Hanky Panky, LTD, New York
- Haute Hippie, New York
- Heidi Merrick, Los Angeles, CA
- Jill Stuart International, New York
- Joe Fresh, New York
- Jordache Enterprises, New York

- Junko Yoshioka, New York
- Komar, Jersey City, NJ
- Lewuxing Culture Communication Co., Ltd., China
- Lillie Designs/ Lillie Couture, Philadelphia, PA
- Lilly Pulitzer, Greater Philadelphia Area
- LL Bean, Freeport, ME
- Lori Coulter, LLC, St. Louis, MO
- Maggie Norris Couture, New York
- Marchesa, New York, NY
- Marios Schwab Ltd., London, UK
- Michael Kors, New York
- Milly LLC, New York
- Naeem Khan LTD, New York
- Nanette Lepore,New York
- Nation Design, New York
- Ohne Titel, New York
- PARIGI Group, Greater Philadelphia Area
- Parker, New York
- Peter Pilotto, London, UK
- Philadelphia Museum of Art, Philadelphia, PA
- Priscilla Costa, Greater Philadelphia Area
- Rockport, West Newton, MA
- Sally Lapointe, New York
- Shehu, Philadelphia, PA
- Shima Seiki USA, Inc., South New Jersey
- Shoshanna, New York
- SOTU Productions, New York
- Thakoon, New York
- The Mews Bridal, London, England
- The Tailory, Philadelphia, PA
- Timo Weiland, New York
- Top Hat Formal Wear, Puerto Rico
- Triam International Limited, Kowloon Hong Kong
- Ulla Johnson, New York
- Urban Outfitters, Philadelphia, PA
- Veda, New York
- VF Sportswear, New York
- Walter Baker, New York
- Yes Master for IMAGO Creations, Ltd, Middlesex, UK
- Yumi Kim, New York
- Zac Posen, New York

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Facilities

Drexel University's Antoinette Westphal College of Media Arts & Design is located in the new URBN Center at 3501 Market Street in Philadelphia. The URBN Center is a 140,000 square foot state-of-the art facility where the Fashion Design studios are located on the 3rd floor.

Classes are held in fully equipped studios for design and construction, pattern drafting, CAD design, 3-D garment simulation, and textile design

including a dedicated senior and graduate design studio. Other studios on the 3rd floor include a specialty equipment lab, computer lab, knitwear studio, a fabric dying and research lab, fashion drawing studio, and the Charles Evans Library. In our state of the art knitwear lab, students have access to Shima Seiki's computerized flat knitting machine, and APEX Design Systems.

The R (http://www.drexel.edu/westphal/resources/FHCC/)obert and Penny Fox Historic Costume Collection (http://www.drexel.edu/foxcollection/) (FHCC), currently estimated to hold more than 12,000 objects, is located on the first floor and is an invaluable library, archive, gallery and educational tool for our students as well as scholars, historians, artists and designers in the national and international community. Also located on the first floor is the Hybrid Making Lab (http://www.drexel.edu/westphal/about/overview/making_spaces/HybridMakingLab/). This lab provides collaborative design and research opportunities both within Westphal College and University wide. The exCITe Center (http://drexel.edu/excite/) (Expressive and Creative Interaction Technologies), located next door at 3401 Market Street, welcomes students and faculty from across the University as well as the community.

The open environment of the URBN Center provides opportunity for collaboration with all of the programs at the Westphal College. Design & Merchandising is on the first floor, opposite the main lobby where work from all of the College's students is regularly displayed. Digital Media, Animation & Visual Effects, Game Art & Production, Web Development & Interaction Design, Product Design, Graphic Design, Interiors, and Architecture's studios and labs are also located in the URBN Center. The Center encourages anyone interested to schedule a visit (http://www.drexel.edu/westphal/about/contact/) to experience the creativity, technology, innovation and resulting excitement.

Fashion Design Faculty

Anita Dennis, AST *(Art Institute of Philadelphia) Fashion Laboratory Technician.* Assistant Teaching Professor. Fashion designer and technician; construction skills.

Genevieve Dion, MFA *(University of the Arts) Director, Center for Functional Fabrics.* Associate Professor. Industrial designer, wearable artist, new materials technology research.

Ann Gerondelis, AIA, IDSA *(Georgia Institute of Technology) Design Department Head.* Teaching Professor. Embodied perception and its relationship to the design of human experiences, from the scale of the built environment to objects that surround us.

Liz Goldberg, MFA *(Pratt Institute).* Adjunct Professor. Artist, painter and animator

Cynthia Golembuski, MS *(Drexel University) Associate Program Director, Fashion Design.* Teaching Professor. Fashion designer, illustrator, computer aided design.

Lisa Hayes, BFA *(Syracuse University) Program Director, Fashion Design.* Associate Professor. Fashion designer, product designer, pattern design, sustainability specialist.

Jaeyoon Jeong, MS *(Drexel University).* Assistant Teaching Professor. Owner/Designer Jaeyoon Jeong Collection, 3D garment simulation and patternmaking.

Autumn Kietponglert, MS *(Drexel University).* Adjunct Professor. Designer at Autumnlin Atelier. Creative technologies specialist.

Jackie Kilmartin, MS *(University of the Sciences).* Assistant Professor. Owner/designer Lillian Jackson Textiles, bio-medical textile engineer, Shima Seiki Knitwear Specialist

Hyun-Ah Kim, BS *(Drexel University).* Adjunct Professor. Designer and design consultant, CAD pattern maker and design consultant

Jan Marshall, BA *(Long Island University).* Assistant Teaching Professor. Fashion designer, knitwear, product development, fashion analysis.

Kathi Martin, MSIS *(Drexel University) Associate Director of the Graduate Program in Fashion Design.* Professor. Fashion and textile designer; textile artist; CAD and 3D garment simulation, best practices online databases and graphic interfaces for fashion and historic costume, virtual characters for fashion design.

Alphonso McClendon, MS *(Drexel University) Program Director, Design & Merchandising.* Associate Professor. Merchandising operations, product development, sourcing, omni-channel strategies.

Elizabeth Quinn, MS *(Drexel University).* Adjunct Professor. Fashion designer. Sustainability specialist.

Clare Sauro, MA *(Fashion Institute of Technology) Curator, Historic Costume Collection.* Associate Teaching Professor. Costume history.

Giulia Sebring, Masters *(Instituto Marangoni).* Adjunct Professor. Designer.

Domenica Vinci, BS *(Philadelphia University).* Adjunct Professor. Designer at Off da Wall Graffiti

Emeritus Faculty

Roberta Gruber, MS *(Drexel University).* Associate Professor Emeritus. Fashion designer and illustrator; wearable artist, merchandiser, special events.

Film & Television

Major: Film and Television Production
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 185.0
Co-op Options: One Co-op (Four years)
Classification of Instructional Program (CIP) code: 50.0602
Standard Occupational Classification (SOC) code: *27-2012*; *27-4031*; *27-4032*

About the Program

The Film & Television major offers a balance of technical craft and artistic vision that prepares students to pursue professional careers in the Film and Television industries. The program is hands-on with core themes driving each year: Story, Voice, Professional Practice, and Implementation. There is also substantial coursework in screenwriting and film studies.

This highly competitive program, with only sixty-four freshmen accepted annually, features smaller classes that foster student-faculty interaction and mentoring, as well as ample access to excellent equipment. The unique Drexel co-op and Los Angeles Summer Program enhance education by providing students with professional employment experience.

The Film & Television program also offers minors in Film Studies (p. 576) and Video Production (p. 584).

Additional Information

For more information about this program, contact the program director:

Tom Quinn
Film & Television
Department of Cinema and Television
Antoinette Westphal College of Media Arts and Design
teq23@drexel.edu

Admission Requirements

- Optional portfolio
- GPA: 2.75
- SAT: 1100

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 119	Mathematical Foundations for Design	4.0
UNIV A101	The Drexel Experience	2.0
VSST 107	Introduction to Design for Media	3.0
Required Arts and Humanities-students select a minimum of 9 credits		9.0
Required Natural Science-students select a minimum of 6 credits		6.0
Required Social Science-students select a minimum of 9 credits		9.0
Electives [*]		24.0

Film & TV Production Core Courses

FMST 105	Film History & Theory I	3.0
FMST 205	Film History & Theory II	3.0
FMST 250	The Documentary Tradition	3.0
FMTV 100	Visual Storytelling	3.0
FMTV 110	Basic Cinematography	3.0
FMTV 115	Basic Editing	3.0
FMTV 120	Basic Sound	3.0
FMTV 130	Basic TV Studio	3.0
FMTV 185	TV Industry	3.0
FMTV 200	Voice & Style	3.0
FMTV 201	Portfolio Prep	1.0
FMTV 210	Intermediate Cinematography	3.0
FMTV 211	Intermediate Lighting	3.0
FMTV 215	Intermediate Editing	3.0
FMTV 220	Intermediate Sound	3.0
FMTV 230	Intermediate TV Studio	3.0
FMTV 240	Narrative Film	3.0
FMTV 245	Microbudget Film	3.0
or FMTV 265	Commercials and Promos	
FMTV 250	Documentary Film	3.0

FMTV 260	Experimental Film	3.0
FMTV 270	Basic Directing	3.0
FMTV 275	Intermediate Directing	3.0
FMTV 280	Basic Producing	3.0
FMTV 285	Media Law and Ethics	3.0
FMTV 340	Production Workshop	3.0
FMTV 401	Creative Careers	3.0
FMTV 495	Senior Project	9.0
SCRP 150	Entertainment Storytelling Fundamentals	3.0
SCRP 270 [WI]	Screenwriting I	3.0
SCRP 280 [WI]	Writing the Short Film	3.0
SCRP 370	Screenplay Story Development	3.0
TVST 105	TV History	3.0
Advanced Production Choice - Select three of the following (includes 300 level FMTV, FMVD, SCRP or TVPR courses):		**9.0**
FMTV 291	Film & TV Internship	
FMTV T380	Special Topics in Film & TV	
FMTV T480	Special Topics in Film & TV	
FMVD 310	Camera Operators Workshop	
FMVD 320	Steadicam Workshop	
FMVD 328	New Technologies in Film	
SCRP 350	TV Comedy Practicum	
SCRP 353	TV Drama Practicum	
TVPR 236	Reality TV Production	
TVPR 291	Television Internship	
TVPR 315	Episodic Webisode Production	
TV Production Choice - Select two of the following (may repeat):		**6.0**
FMTV 345	TV Series I	
FMTV 346	TV Series II	
FMTV 355	DNews	
FMTV 415	TV Series Editing	
FMTV T380	Special Topics in Film & TV	
FMTV T480	Special Topics in Film & TV	
Film Studies or Television Studies Course - Select one of the following (any FMST-Film Studies or TVST-Television Studies course not already required):		**3.0**
FMST 255	Hitchcock	
FMST 262	Film Comedy	
FMST 290	Hollywoodland I	
FMST 291	Hollywoodland II	
FMST 352	The Horror Film	
FMST T380	Special Topics in Film Studies	
FMST T480	Special Topics in Film Studies	
FMVD 316	Post Color Correction	
TVST 361	Art of TV Comedy	
TVST 362	Art of TV Drama	
TVST 363	Science Fiction Television	
TVST 364	Teen Television	
TVST 368	Supernatural Fantasy TV Shows	
TVST T380	Special Topics in TV Studies	
TVST T480	Special Topics in TV Studies	
Total Credits		185.0

[*] Includes Film & TV as well as general electives.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic

advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
FMTV 110	Basic Cinematography	3.0
SCRP 150	Entertainment Storytelling Fundamentals	3.0
UNIV A101	The Drexel Experience	1.0
VSST 107	Introduction to Design for Media	3.0
	Term Credits	13.0
Term 2		
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
FMTV 100	Visual Storytelling	3.0
FMTV 120	Basic Sound	3.0
FMTV 130	Basic TV Studio	3.0
SCRP 270 [WI]	Screenwriting I	3.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	16.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
FMST 105	Film History & Theory I	3.0
FMTV 115	Basic Editing	3.0
MATH 119	Mathematical Foundations for Design	4.0
TVST 105	TV History	3.0
	Term Credits	17.0
Term 4		
FMST 205	Film History & Theory II	3.0
FMST 250	The Documentary Tradition	3.0
FMTV 200	Voice & Style	3.0
FMTV 210	Intermediate Cinematography	3.0
FMTV 250	Documentary Film	3.0
FMTV_TV Production Course		3.0
	Term Credits	18.0
Term 5		
COOP 101	Career Management and Professional Development	0.0
FMTV 211	Intermediate Lighting	3.0
FMTV 230	Intermediate TV Studio	3.0
FMTV 260	Experimental Film	3.0

FMTV 270	Basic Directing	3.0
SCRP 280 [WI]	Writing the Short Film	3.0
	Term Credits	15.0
Term 6		
FMTV 201	Portfolio Prep	1.0
FMTV 215	Intermediate Editing	3.0
FMTV 220	Intermediate Sound	3.0
FMTV 240	Narrative Film	3.0
FMTV 275	Intermediate Directing	3.0
FMTV 280	Basic Producing	3.0
	Term Credits	16.0
Term 7		
Arts & Humanities Elective		3.0
Elective		3.0
Film or TV Studies Elective		3.0
Natural Science Elective		3.0
Social Science Elective		3.0
	Term Credits	15.0
Term 8		
FMTV 185	TV Industry	3.0
FMTV 285	Media Law and Ethics	3.0
FMTV 340	Production Workshop	3.0
Advanced Production Elective		3.0
FMTV_TV Production Choice		3.0
	Term Credits	15.0
Term 9		
FMTV 245 or 265	Microbudget Film Commercials and Promos	3.0
SCRP 370	Screenplay Story Development	3.0
Arts & Humanities Elective		3.0
Natural Science Elective		3.0
Social Science Elective		3.0
	Term Credits	15.0
Term 10		
FMTV 401	Creative Careers	3.0
FMTV 495	Senior Project	3.0
Advanced Production Elective		3.0
Social Science Elective		3.0
Elective		3.0
	Term Credits	15.0
Term 11		
FMTV 495	Senior Project	3.0
Advanced Production Elective		3.0
Arts & Humanities Elective		3.0
Electives		6.0
	Term Credits	15.0
Term 12		
FMTV 495	Senior Project	3.0
Electives		12.0
	Term Credits	15.0

Total Credit: 185.0

Co-op/Career Opportunities

Opportunities

Students who study film and video can move on to careers as film or video directors, producers, video or film editors, directors of photography (film), camerawork, as well as grips and special effects coordinators.

Co-Op Experiences

Some past co-op employers of film and video students include:

- USA Network, New York
- Comcast, Philadelphia
- Bad Robot, Los Angeles
- ICM, Los Angeles
- Focus Features, New York
- Law & Order, New York
- NFL Films, Mount Laurel, New Jersey
- Tribecca Film Center, New York
- National Geographic Television, Washington DC
- NBC, New York
- Paramount Studios, Los Angeles
- MTV, New York

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Facilities

Film and Video facilities include a shooting studio with green screen; two screening rooms; a fully equipped HD television studio; post-production labs for editing, color correction and audio recording & mixing; specially outfitted multimedia rooms; state of the art film production equipment including cameras, steadicams, lighting and audio equipment.

Additionally, the college operates DUTV (http://www.dutv.org/), a HD cable television station reaching over 350,000 households.

Film & Video Faculty

John Avarese, BS *(Drexel University)*. Assistant Teaching Professor. Composer, film and video scores, mixing and sound design.

Alison Bagnall, BA *(Yale University)*. Visiting Professor. Filmmaker

David Deneen, BFA *(Philadelphia College of Art)*. Assistant Teaching Professor. Film & video.

Gerard M. Hooper, MFA *(Temple University)*. Associate Teaching Professor. Film and video; European and non-western cinema.

D. B. Jones, PhD *(Stanford University)*. Professor. Film and video; cinema studies.

Matthew Kaufhold, MA *(University of North Carolina) Program Director, Screenwriting and Playwriting*. Associate Teaching Professor. Screenwriter, Producer.

Karin P. Kelly, MFA *(New York University) Department Head, Cinema and Television*. Associate Professor. Film and video; filmmaker and author.

Yvonne D. Leach, MFA *(Temple University)*. Associate Professor. Television studies.

Thomas Quinn, MFA *(Temple University) Program Director, Film & Video*. Assistant Professor. Writer, Director, filmmaker.

Philip W. Salas, BS *(Temple University)*. Assistant Teaching Professor. Utilization of advanced set top box data to measure fragmented viewing behavior. Impact of new television distribution technologies on traditional broadcasters and multichannel program providers.

David A. Schwartz, BA *(Rider University)*. Associate Teaching Professor. Steadicam operator; cameraman.

Andrew Susskind, BA *(Harvard University) Program Director of TV Production & Media Management*. Associate Teaching Professor. Producing for Television, The Sitcom, Directing Single and Multi-Camera

Jocelyn Tarquini, MFA *(American Film Institute)*. Assistant Teaching Professor. Editing, post-production.

Emeritus Faculty

Ian Abrams, BA *(Duke University)*. Associate Professor. Screenwriting, movies, film, Hollywood.

Albert S. Tedesco, MA *(University of Pennsylvania)*. Teaching Professor. Media Management, Organizational Structure, Research Methods, Media Ethics, Media Law, The Regulatory Environment, Technology Assessment, Media Theory, Media Analytics

Game Design & Production

Major: Game Design and Production
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 190.0
Co-op Options: Three Co-op (Five years); One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 50.0411
Standard Occupational Classification (SOC) code: 27-1014; 25-1199

About the Program

Drexel's Game Design & Production program, nationally ranked in the top-ten by multiple organizations including the Princeton Review, combines a strong comprehension of animation and interactivity with an understanding of design, programming, production, and teamwork.

The major mirrors a sector that has seen an explosion in gaming, not just in personal entertainment, but throughout multiple industries and the corporate world. The gaming industry has matured into a source of large-budget AAA and smaller indie entertainment projects. It encompasses the use of serious gaming, where gaming technologies are used in education and training for practically any topic.

Fully immersive games use constantly evolving methods of presentation and interaction, such as personal data-trackers, Internet-of-Things (IoT), multi-touch displays, mediated-reality (augmented and virtual), motion and gesture capture, motion simulation, and haptic devices. To best prepare for the demands of careers in these rapidly changing disciplines, students pursue a foundation of design and technology, taking core courses in all aspects of digital media, completing six or eighteen-month co-op experiences and delving into rigorous specialty coursework. Provided a robust foundation, students are prepared to adapt to shifting industry demands and maintain a fluency across the digital media spectrum.

Students begin making games in the first term as freshmen and continue making team-based game projects both small and large throughout their plan of study. Interdisciplinary teamwork is a core skill developed in teams of two to over eighteen, often spanning multiple programs including Computer Science, Music Industry, Animation, and more. Every project enables students to experiment and refine their experience in the

many roles required to produce a finished game. Drexel University offers multiple opportunities to support the entrepreneurially minded student, from the Entrepreneurial Game Studio (https://egs.excite.drexel.edu/) to the Close School of Entrepreneurship (http://drexel.edu/close/) and the Baiada Institute for Entrepreneurship (http://drexel.edu/baiada/).

To complement the creative focus of the Game Design & Production major, a minor in Computer Science is popular, and in many cases an ideal supplement for Game Design & Production students. This minor increases programming knowledge while maintaining a creative design and production focus. This or any of the over 120 minors available at Drexel would be easy to achieve within a plan of study using free electives. For the computer-engineering-focused, a sister concentration in game programming and development (p. 184) is offered as part of Drexel's major in computer science (p. 171).

Additional Information

To find out more about this major, visit the Westphal College's Game Design & Production Major (http://www.drexel.edu/westphal/undergraduate/GDAP/) page.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General education requirements		
CIVC 101	Introduction to Civic Engagement	1.0
COM 230	Techniques of Speaking	3.0
COOP 101	Career Management and Professional Development	0.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
PHYS 170	Electricity and Motion	3.0
PHYS 171	Computational Lab for Electricity and Motion	1.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
UNIV A101	The Drexel Experience	2.0
Arts and humanities elective		3.0
History (HIST) elective		3.0
Literature (ENGL) elective		3.0
Social sciences electives		9.0
Free electives		24.0
Art and art history requirements		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ARTH 103	History of Art III: Modern Art	3.0
ARTH 300 [WI]	History of Modern Design	3.0
VSST 108	Design I for Media	3.0
VSST 109	Design II for Media	3.0
VSST 110	Introductory Drawing	3.0
VSST 111	Figure Drawing I	3.0
Media and computer science requirements		
CS 171	Computer Programming I	3.0
FMTV 110	Basic Cinematography	3.0
FMVD 206	Audio Production and Post	3.0

GMAP 231	Scripting for Game Design	3.0
SCRP 270 [WI]	Screenwriting I	3.0
Digital media core requirements		
ANIM 140	Computer Graphics Imagery I	3.0
ANIM 145	Realtime Visualization	3.0
ANIM 211	Animation I	3.0
DIGM 105	Overview of Digital Media	3.0
DIGM 350 [WI]	Digital Storytelling	3.0
DIGM 451 [WI]	Explorations in New Media	3.0
DIGM 475 [WI]	Seminar: The Future of Digital Media	3.0
DIGM 490	Digital Media Senior Project [*]	9.0
DIGM 491	Digital Media Senior Project Studio [*]	3.0
GMAP 260	Overview of Computer Gaming	3.0
PROD 215	Design Thinking in Product Design	4.0
Gaming requirements		
GMAP 101	Game Design Lab I	3.0
GMAP 102	Game Design Lab II	3.0
GMAP 121	Game Playtesting (Taken two times.)	2.0
GMAP 123	Basic Portfolio	1.0
GMAP 211	Game User Interface Design	3.0
GMAP 246	Advanced Portfolio (Taken three times.)	3.0
GMAP 301	Game History	3.0
GMAP 345	Game Development Foundations	3.0
GMAP 367	Character Animation for Gaming	3.0
GMAP 377	Game Development: Workshop I	3.0
GMAP 378	Game Development: Workshop II	3.0
GMAP 395	Advanced Game Design and Production	3.0
Select four of the following Gaming Electives		12.0
ANIM 212	Animation II	
ANIM 388	Spatial Data Capture	
ENTP 105	Entrepreneurship Practice & Mindset	
GMAP 341	Serious Games	
GMAP 342	Experimental Games	
GMAP 360	Game Design from the Player's Perspective	
GMAP 368	Artificial Intelligence in Gaming	
GMAP 369	Mobile Game Development	
GMAP T180	Special Topics in Game Art and Production	
GMAP T280	Special Topics in Game Art and Production	
GMAP T380	Special Topics in Game Art and Production	
GMAP T480	Special Topics in Game Art and Production	
SCRP 290	Game: Universe & Story	
SCRP 295	Future of Narrative Games	
Total Credits		190.0

[*]   DIGM 490 and DIGM 491 are repeated 3 times each to complete the DIGM Capstone Senior Project sequence.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-

courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
DIGM 105	Overview of Digital Media	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
GMAP 101	Game Design Lab I	3.0
PHYS 170	Electricity and Motion	3.0
PHYS 171	Computational Lab for Electricity and Motion	1.0
UNIV A101	The Drexel Experience (Department specific.)	1.0
VSST 110	Introductory Drawing	3.0
	Term Credits	17.0
Term 2		
ANIM 140	Computer Graphics Imagery I	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
GMAP 102	Game Design Lab II	3.0
GMAP 123	Basic Portfolio	1.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
UNIV 101	The Drexel Experience (Program specific.)	1.0
VSST 108	Design I for Media	3.0
	Term Credits	18.0
Term 3		
ANIM 145	Realtime Visualization	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
FMTV 110	Basic Cinematography	3.0
GMAP 121	Game Playtesting	1.0
MATH 101	Introduction to Analysis I	4.0
VSST 109	Design II for Media	3.0
	Term Credits	18.0
Term 4		
ANIM 211	Animation I	3.0
CS 171	Computer Programming I	3.0
GMAP 211	Game User Interface Design	3.0
GMAP 260	Overview of Computer Gaming	3.0
GMAP 301	Game History	3.0
	Term Credits	15.0
Term 5		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
COOP 101	Career Management and Professional Development	0.0
GMAP 231	Scripting for Game Design	3.0
GMAP 367	Character Animation for Gaming	3.0
PROD 215	Design Thinking in Product Design	4.0
VSST 111	Figure Drawing I	3.0
	Term Credits	16.0
Term 6		

COM 230	Techniques of Speaking	3.0
GMAP 246	Advanced Portfolio	1.0
GMAP 345	Game Development Foundations	3.0
SCRP 270 [WI]	Screenwriting I	3.0
Free Elective		3.0
Game Elective		3.0
	Term Credits	16.0
Term 7		
ARTH 103	History of Art III: Modern Art	3.0
DIGM 350 [WI]	Digital Storytelling	3.0
FMVD 206	Audio Production and Post	3.0
GMAP 395	Advanced Game Design and Production	3.0
Gaming Elective		3.0
	Term Credits	15.0
Term 8		
ARTH 300 [WI]	History of Modern Design	3.0
DIGM 451 [WI]	Explorations in New Media	3.0
GMAP 246	Advanced Portfolio	1.0
GMAP 377	Game Development: Workshop I	3.0
Arts & Humanities Elective		3.0
Game Elective		3.0
	Term Credits	16.0
Term 9		
DIGM 475 [WI]	Seminar: The Future of Digital Media	3.0
GMAP 121	Game Playtesting	1.0
GMAP 378	Game Development: Workshop II	3.0
Free elective		3.0
Gaming Elective		3.0
Social Science Elective		3.0
	Term Credits	16.0
Term 10		
DIGM 490	Digital Media Senior Project	3.0
DIGM 491	Digital Media Senior Project Studio	1.0
Free Electives		6.0
Literature (ENGL) Elective		3.0
Social Science Elective		3.0
	Term Credits	16.0
Term 11		
DIGM 490	Digital Media Senior Project	3.0
DIGM 491	Digital Media Senior Project Studio	1.0
GMAP 246	Advanced Portfolio	1.0
Free Electives		6.0
Social Science Elective		3.0
	Term Credits	14.0
Term 12		
DIGM 490	Digital Media Senior Project	3.0
DIGM 491	Digital Media Senior Project Studio	1.0
History (HIST) Elective		3.0
Free Electives		6.0
	Term Credits	13.0

Total Credit: 190.0

Co-op/Career Opportunities

Drexel students have broad training in all areas of game design and production, and our students have career opportunities in both entertainment gaming and broader simulation/training industries, and anywhere interactive gaming technology is applied - a growing segment in all industries.

Co-op Experiences

Building a career often begins with a few key contacts - especially through alumni already working professionally - and the co-op program gives Drexel students the chance to meet professionals, make their skills known, and build their personal network. A recent co-op student at Microsoft Studios worked with producers on several different titles and was offered a job in their junior year that was waiting for them after graduation.

In addition to small and large entertainment companies, students have opportunities to explore how game design is applicable to many local and international industries ranging from aerospace to pharmaceuticals to home and yacht design.

Recent co-op opportunities include game and digital media jobs in Philadelphia region companies like *eNable Games, Entrepreneurial Game Studio, GLIDE Lab, iD Tech Game Design & Development Academy, IDEA, Penn Medicine, PHL Collective, Skyless Game Studios, Tipping Point Media, and Virtual Health.*

Students also secured game and digital media co-ops at national and international companies, like *Rockstar Games* in San Diego and *Inter Media Japan* in Tokyo.

Career Experiences

Our network of successful game development alum work in leading entertainment companies including *343 Industries, Blizzard, Disney, EA Games, Gearbox Software, Ghost Story Games, Industrial Light & Magic, Irrational Games, Microsoft Studios, Microsoft Xbox, Midway, NCsoft, NeatherRealm Studios, Nexon, Oculus VR, Riot Games, Rockstar Games, Schell Games, Sony SCEA, Spry Fox, The Coalition, Turn 10 Studios, Volition, and Zynga.*

Other students chose small-to-mid-size studios or launch their own digital media enterprises, like *Tom Fulp*, founder of *Newgrounds.com*, or indie game companies, like *Dan Fornace*, creator of *Rivals of Aether*, *Greg Lobanov*, creator of *Wandersong,* or *Tom Sharpe,* director of *Gossamer Games* and their award-winning title, *Sole*. Students also chose to work outside of entertainment by applying their game production skills to training, simulation, marketing, or education endeavors with companies including *Comcast, Lockheed Martin, and Vanguard.*

Jobs titles include *Art Director, Animator, Associate Producer, Character Animator, Cinematic Lead, Cinematics Animator, Community Manager, Digital Project Coordinator, Facial Capture Artist, Game Designer, Lead Cinematic Animator, Lead Technical Director, Lead Virtual Production Manager, Marketing Manager, Motion Capture Technician, Previsualization Supervisor, Program Manager, Programmer, Senior Animator, Senior Artist, Senior Community Manager, Simulation Developer, Technical Artist, and Virtual Production Engineer.*

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Dual Accelerated Degrees

BS/MS in Digital Media

The accelerated degree programs enable academically qualified students to earn both a bachelor's and a master's degree in five years instead of six — graduating sooner than they would in traditional programs. In addition, the graduate-level courses students take in their junior and senior years are included in their undergraduate tuition, which saves almost a year's worth of their MS tuition.

Current Drexel students in the 4-year/1-Co-Op program may apply for an accelerated degree programs through the Graduate College of Drexel University (http://drexel.edu/graduatecollege/) after completing 90.0 credits, but no more than 120.0 credits. Many of our accelerated students have gone on to careers at leading companies including *Pixar, Microsoft Studios, Dreamworks, NCSoft, and Disney.*

Game Design and Production Faculty

Milady S. Bridges, BA *(Rutgers University) Program Director, Animation and Visual Effects.* Assistant Teaching Professor. Animation and visual effects technical artist.

Paul Diefenbach, PhD *(University of Pennsylvania).* Associate Professor. Game development, real-time rendering.

Troy Finamore, MS *(Drexel University) Program Director, Interactive Digital Media.* Associate Teaching Professor. Advertising, design and interactivity.

Nick Jushchyshyn, MFA *(Academy of Art University) Program Director, VR & Immersive Media.* Associate Professor. Visual effects, digital media and animation.

Frank J. Lee, PhD *(Carnegie Mellon University).* Professor. Human-computer interaction; cognitive engineering and science; intelligent software agents for games and education.

Robert Lloyd, MFA *(Temple University) Program Director, Game Design & Production.* Associate Teaching Professor. Game development, themed entertainment and motion simulation.

Natalie Mathe, PhD *(National School of Space and Aeronautics, France) Program Director, Digital Media Graduate.* Assistant Professor. VR, immersive film, and visual effects.

David Mauriello, BA *(Lafayette College).* Assistant Professor. 3D modeling and animation.

Glen Muschio, PhD *(Temple University).* Associate Professor. Digital media, society, communication.

Emil Polyak, MDCArtDes *(University of New South Wales).* Assistant Professor. Cross-disciplinary art and design

Stefan Rank, PhD *(Vienna University of Technology).* Associate Professor. Artificial intelligence, game design and human-computer interaction.

Daniel Rose, BS *(Purdue University).* Assistant Teaching Professor. AAA and freelance game developer and environmental artist

Tony https://drexel.edu/westphal/about/directory/RoweTony/ Rowe Assistant Teaching Professor. AAA game developer, writer, level designer, and historian.

Jervis Thompson, BS *(Drexel University).* Teaching Professor. Digital media, interactive multimedia.

Michael Wagner, PhD *(Vienna University of Technology) Program Director, Digital Media.* Associate Professor. Educational use of digital media and computer games.

Jichen Zhu, PhD *(Georgia Institute of Technology)*. Associate Professor. Developing humanistic and interpretive framework of computational technology, particularly artificial intelligence (AI), and constructing AI-based cultural artifacts; interactive storytelling, games and software studies.

Emeritus Faculty

Theo Artz, BFA *(Tyler School of Art, Temple University)*. Associate Professor. Digital media.

Graphic Design

Major: Graphic Design
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 183.0
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 50.0409
Standard Occupational Classification (SOC) code: 27-1024

About the Program

Westphal College's graphic design curriculum provides a balance of theory and practice in rigorous design study enhanced by general education coursework in the humanities and the physical and social sciences. Students learn to conceptualize, visualize and realize visual communications through the rigor of project-based exploration and experimentation based on the formal foundations of typography, image-making, aesthetics and critical thinking. Graphic design students are immersed in all aspects of visual communications, such as books, magazines and publications (print and screen based), posters, advertising, packaging, web, motion and interactive design, exhibition design and data visualization. Working on two- and three-dimensional projects and electronic media, students utilize the latest applications and emerging technologies to stay current with the industry.

Graphic design students can also pursue advanced elective coursework in web and motion graphic design, environmental graphic design, experimental publication design and other interdisciplinary special topics projects.

Additional Information

For more information about the major, visit the Graphic Design (http://www.drexel.edu/westphal/academics/undergraduate/VSCM/) program web page or contact Program Director Bill Rees (wbr24@drexel.edu).

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 119	Mathematical Foundations for Design	4.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
UNIV A101	The Drexel Experience	2.0
Required Arts and Humanities-students elect a minimum of 9.0 credits		9.0
Required Natural Science-students elect a minimum of 4.0 credits		4.0
Required Social Science-students elect a minimum of 9.0 credits		9.0
Free electives		23.0
Co-operative education (two terms)		0.0
Visual Studies Requirements		
ARTH 101	History of Art I: Ancient to Medieval	3.0
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ARTH 103	History of Art III: Modern Art	3.0
PHTO 110	Photography	3.0
VSST 101	Design I	4.0
VSST 102	Design II	4.0
VSST 103	Design III	4.0
VSST 110	Introductory Drawing	3.0
VSST 111	Figure Drawing I	3.0
VSST 301	Painting I	4.0
VSST 321	Screenprint I	4.0
Visual Studies (VSST) elective		4.0
Graphic Design Requirements		
ARTH 300 [WI]	History of Modern Design	3.0
PHTO 210	Intermediate Photography	3.0
VSCM 100	Computer Imaging I	3.0
VSCM 200	Computer Imaging II	3.0
VSCM 230	Visual Communication I	4.0
VSCM 231	Visual Communication II	4.0
VSCM 232	Visual Communication III	4.0
VSCM 240	Typography I	3.0
VSCM 241	Production	3.0
VSCM 242	Typography II	3.0
VSCM 332	Visual Communication IV	4.0
VSCM 333	Visual Communication V	4.0
VSCM 340	Typography III	3.0
VSCM 350 [WI]	Graphic Design: 20th Century and Beyond	3.0
VSCM 430	Visual Communication VI	4.0
VSCM 440	Book Design	4.0
VSCM 450	Professional Portfolio	3.0
VSCM 460	Professional Practice	3.0
VSCM 496	Senior Capstone	3.0
WMGD 210	Motion Graphics I	4.0
WMGD 220	Web Graphics I	4.0
WMGD 330	Web Graphics II	4.0
Total Credits		183.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing

Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

BS in Graphic Design: General Plan of Study

Term 1		Credits
ARTH 101	History of Art I: Ancient to Medieval	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
UNIV A101	The Drexel Experience	1.0
VSST 101	Design I	4.0
VSST 110	Introductory Drawing	3.0
	Term Credits	14.0
Term 2		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
UNIV A101	The Drexel Experience	1.0
VSST 102	Design II	4.0
	Term Credits	15.0
Term 3		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 119	Mathematical Foundations for Design	4.0
VSCM 100	Computer Imaging I	3.0
VSST 103	Design III	4.0
	Term Credits	14.0
Term 4		
ARTH 103	History of Art III: Modern Art	3.0
PHTO 110	Photography	3.0
VSCM 200	Computer Imaging II	3.0
VSCM 230	Visual Communication I	4.0
VSCM 240	Typography I	3.0
	Term Credits	16.0
Term 5		
COOP 101	Career Management and Professional Development	0.0
PHTO 210	Intermediate Photography	3.0
VSCM 231	Visual Communication II	4.0
VSCM 242	Typography II	3.0
VSST 111	Figure Drawing I	3.0
WMGD 220	Web Graphics I	4.0
	Term Credits	17.0
Term 6		
VSCM 232	Visual Communication III	4.0
VSCM 241	Production	3.0
WMGD 330	Web Graphics II	4.0
Free elective		3.0
Social Science elective		3.0
	Term Credits	17.0
Term 7		
ARTH 300 [WI]	History of Modern Design	3.0
CIVC 101	Introduction to Civic Engagement	1.0
VSST 321	Screenprint I	4.0
Arts and Humanities elective		3.0
Natural Science		4.0
	Term Credits	15.0
Term 8		
VSCM 340	Typography III	3.0
VSCM 332	Visual Communication IV	4.0
WMGD 210	Motion Graphics I	4.0
Visual Studies (VSST) elective[*]		4.0
Arts and Humanities elective		3.0
	Term Credits	18.0
Term 9		
VSCM 350 [WI]	Graphic Design: 20th Century and Beyond	3.0
VSCM 333	Visual Communication V	4.0
VSST 301	Painting I	4.0
Social science elective		3.0
Arts and Humanities elective		3.0
	Term Credits	17.0
Term 10		
VSCM 430	Visual Communication VI	4.0
VSCM 440	Book Design	4.0
Social science elective		3.0
Free elective		3.0
	Term Credits	14.0
Term 11		
VSCM 450	Professional Portfolio	3.0
Free electives		9.0
	Term Credits	12.0
Term 12		
VSCM 460	Professional Practice	3.0
VSCM 496	Senior Capstone	3.0
Free electives		8.0
	Term Credits	14.0

Total Credit: 183.0

See degree requirements (p. 539) for list of Graphic Design electives.

[*] Visual Studies (VSST) elective: choose from any upper-level VSST course.

Co-op/Career Opportunities

Potential employers include advertising agencies, publishers, printers, independent and in-house design studios, museums and galleries, magazines and newspapers, and television. Training in visual communication prepares an individual for careers in many fields because the problem-solving methods and organizational skills it builds are widely applicable.

Co-op Experiences

Following is a sampling of graphic design co-op employers:

- Comcast (http://corporate.comcast.com/)
- Esquire (http://www.esquire.com/)
- The Franklin Institute (https://www.fi.edu/)

- Hasbro (https://www.hasbro.com/en-us/)
- Intuitive Company (http://intuitivecompany.com/)
- National Constitution Center (https://constitutioncenter.org/)
- Philadelphia Museum of Art (http://www.philamuseum.org/)
- Philadelphia Union (http://www.philadelphiaunion.com/)
- Quirk Books (http://www.quirkbooks.com/)
- Razorfish (https://razorfish.health/)
- WebLinc (https://www.weblinc.com/)

Career Opportunities

Our graphic design alumni go on to successful careers in a range of positions including lead designer, creative director, art director, interaction designer, user experience director, and owner or partner of firms. Some of the companies where you will find our alumni include:

- AgileCat (http://agilecat.com/)
- America'#s Test Kitchen (https://www.americastestkitchen.com/)
- Ann Taylor Inc (http://www.anninc.com/)
- Apple (https://www.apple.com/)
- Bloomberg (https://www.bloomberg.com/)
- Blue Cadet (http://www.bluecadet.com/)
- Brooks Brothers (http://www.brooksbrothers.com/)
- Comcast Corporation (http://corporate.comcast.com/)
- Conde Nast (http://www.condenast.com/)
- eCity Interactive (http://www.ecityinteractive.com/)
- ESPN (http://www.espn.com/)
- exit (http://www.exploreexit.com/)
- Facebook (https://www.facebook.com/careers/?ref=pf)
- The Franklin Institute (https://www.fi.edu/)
- Intuitive Company (http://intuitivecompany.com/)
- Kikkerland (https://kikkerland.com/)
- Longwood Gardens (https://longwoodgardens.org/)
- Marvel Entertainment (http://marvel.com/)
- Michael Graves Design Group (https://michaelgraves.com/)
- National Constitution Center (https://constitutioncenter.org/)
- QVC (http://www.qvc.com/)
- Philadelphia Museum of Art (http://www.philamuseum.org/)
- Saatchi & Saatchi (http://saatchi.com/en-us/)
- Sesame Workshop (http://www.sesameworkshop.org/)
- Time Inc. (https://www.timeinc.com/)
- Under Armour (https://www.underarmour.com/en-us/)
- Vera Bradley (https://www.verabradley.com/us/Home/)

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Facilities

The graphic design studios are located on the fourth floor of the URBN Center in the Antoinette Westphal College of Media Arts and Design. There are five dedicated studios equipped with up-to-date electronic and traditional tools. Studios have work surfaces for traditional practices that will accommodate 15 students, and wall surfaces for critiques or posting examples of printed work. In addition, students have access to a dedicated, non-scheduled graphic design "open lab" equipped with all necessary technology and work surfaces.

Graphic Design Faculty

Joshua Gdovin, BS *(Drexel University)*. Associate Teaching Professor. Graphic design; web graphics; motion graphics, and capstone.

Jody Graff, BS *(Drexel University)*. Associate Professor. Graphic design; publication design, annual report design, three-dimensional graphics and packaging, environmental graphic design (exhibition and wayfinding), and capstone.

Eric Karnes, MFA *(Virginia Commonwealth University)*. Assistant Professor. Graphic design; logo design, corporate identity, typography, advanced typography, publication design, book design, professional portfolio, capstone.

William Rees, BS *(Drexel University) Program Director, Graphic Design*. Teaching Professor. Graphic design; logo design, corporate identity, publication design, electronic imaging, print production, professional portfolio, and thesis.

Sandra Stewart, BFA *(Tyler School of Art, Temple University)*. Associate Professor. Graphic design; logo design, corporate identity, publication design, three-dimensional graphics and packaging, and capstone.

Mark Willie, MFA *(Boston Museum School of Fine Arts) Associate Program Director*. Teaching Professor. Graphic design; typography, logo design, corporate identity, publication design, book design, professional portfolio, and capstone.

Shushi Yoshinaga, BFA *(Philadelphia College of the Arts)*. Associate Professor. Graphic design; letterform, typography, and capstone.

Interactive Digital Media

Major: Interactive Digital Media
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 187.0
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 11.0801
Standard Occupational Classification (SOC) code: 15-1250

About the Major

Technology and your future career prospects are evolving at lightning speeds. Where it was once as simple as pursuing "website design" or "programming," today's world offers—and demands—more. To truly succeed in tech, you need creativity, versatility, and an interdisciplinary skillset. You need to be able to see through the eyes of the user and understand projects from start to finish. You need to be a unicorn.

Interactive Digital Media (IDM) helps you get there.

By combining principles from a range of disciplines, IDM gives you the tools not only to understand technology but also the human principles underpinning it. You'll get exposure to:

- **User Experience Design (UX)**—Researching and advocating for the needs of people who will be using technologies, prototyping digital products, and working with agile methodologies

- **User Interface and Interaction Design (UI/IXD)**—Using tools like Adobe Creative Suite to create visual experiences for technology products
- **Development**—Programming the code (HTML/CSS, Javascript, PHP/MySQL, etc.) that makes products work in a variety of media (websites, apps, augmented and virtual reality, Internet of Things, etc.)
- **Information Architecture (IA) and Content Strategy**—Organizing and planning information systems for digital products
- **Project Managemen**t—Managing workflows to keep teams on track

As a freshman, you learn the basics of design. In sophomore year, you learn the coding and development skills to bring those designs to life. Your junior and senior studies are focused on electives and interdisciplinary teamwork. You'll spend six months working full-time within a company through Drexel's Cooperative Education program, and your capstone project will result in a full-scale, industry-level product launch.

By the end of this program, you'll have real-world experience, an enviable portfolio, and the highly adaptable skills to find your way in the uncertain, ever-evolving world of tech.

Additional Information

To find out more, visit the Westphal College's Interactive Digital Media major (http://drexel.edu/westphal/academics/undergraduate/IDM/) web page to see student projects (http://drexel.edu/westphal/academics/undergraduate/IDM/Creative-Work/) and successful alumni (http://drexel.edu/westphal/academics/undergraduate/IDM/Alumni%20Spotlight/).

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education Requirements

CIVC 101	Introduction to Civic Engagement	1.0
COM 230	Techniques of Speaking	3.0
COOP 101	Career Management and Professional Development	0.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 119	Mathematical Foundations for Design	4.0
PHYS 170	Electricity and Motion	3.0
PHYS 171	Computational Lab for Electricity and Motion	1.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
PSY 330	Cognitive Psychology	3.0
PSY 332	Human Factors and Cognitive Engineering	3.0
PSY 337	Human-Computer Interaction	3.0
UNIV A101	The Drexel Experience	2.0
Arts & Humanities-students elective		3.0
History (HIST) elective		3.0
Literature (ENGL) elective		3.0
Free electives		24.0

Art and Art History Requirements

ARTH 103	History of Art III: Modern Art	3.0
ARTH 300 [WI]	History of Modern Design	3.0
ARTH 314	Contemporary Art	3.0
VSST 108	Design I for Media	3.0
VSST 109	Design II for Media	3.0
VSST 110	Introductory Drawing	3.0

Business & Management Requirements

EAM 211	Strategic Management for Entertainment and Arts Management	3.0

Media Requirements

FMVD 206	Audio Production and Post	3.0
PROD 215	Design Thinking in Product Design	4.0
PHTO 110	Photography	3.0
WEST 107	Maker Workshop	3.0

Digital Media Core Requirements

ANIM 115	Introduction to Production with Animation & VFX	3.0
DIGM 105	Overview of Digital Media	3.0
DIGM 475 [WI]	Seminar: The Future of Digital Media	3.0
DIGM 490	Digital Media Senior Project	9.0
DIGM 491	Digital Media Senior Project Studio	3.0
GMAP 260	Overview of Computer Gaming	3.0

Interactive Digital Media Requirements

IDM 101	History of Web Development	3.0
IDM 211	User Interface Design I	3.0
IDM 212	User Interface Design II	3.0
IDM 213	Interaction Design	3.0
IDM 215	User Experience Design I	3.0
IDM 216	User Experience Design II	3.0
IDM 221	Web Design I	3.0
IDM 222	Web Design II	3.0
IDM 231	Scripting for Interactive Digital Media I	3.0
IDM 232	Scripting for Interactive Digital Media II	3.0
IDM 241	Microinteractions	3.0
IDM 250	Content Management Systems	3.0
IDM 371	Interactive Digital Media Workshop I	3.0
IDM 372	Interactive Digital Media Workshop II	3.0
IDM 401	Professional Practices in Interactive Digital Media	3.0
IDM 418	Storytelling for User Experience Design	3.0
Select four (4) of the following:		**12.0**
DIGM 308 [WI]	Digital Cultural Heritage	
DIGM 451 [WI]	Explorations in New Media	
EAM 315	Content Strategies for Digital Products	
IDM 240	Interactive Graphics	
IDM 245	Web Game Design	
IDM 311	User Interface Design for Immersive Media	
IDM 331	WebVR	
IDM 361	Interactive App Design I	
IDM 362	Interactive App Design II	
IDM 363	Interactive App Design III	
IDM 364	Interactive App Design IV	
IDM 381	Experimental Interactive Technologies	
IDM 382	Internet of Things	
IDM 402	Validating Product Ideas	
IDM 417	User Research Methodologies	
IDM T380	Special Topics in Interactive Digital Media	
IDM I399	Independent Study in Interactive Digital Media	
Total Credits		187.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must

be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
DIGM 105	Overview of Digital Media	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
IDM 211	User Interface Design I	3.0
PROD 215	Design Thinking in Product Design	4.0
UNIV A101	The Drexel Experience	1.0
VSST 110	Introductory Drawing	3.0
	Term Credits	17.0
Term 2		
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
IDM 101	History of Web Development	3.0
IDM 212	User Interface Design II	3.0
PSY 330	Cognitive Psychology	3.0
UNIV A101	The Drexel Experience	1.0
VSST 108	Design I for Media	3.0
WEST 107	Maker Workshop	3.0
	Term Credits	19.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
IDM 213	Interaction Design	3.0
MATH 119	Mathematical Foundations for Design	4.0
PSY 337	Human-Computer Interaction	3.0
VSST 109	Design II for Media	3.0
	Term Credits	17.0
Term 4		
EAM 211	Strategic Management for Entertainment and Arts Management	3.0
GMAP 260	Overview of Computer Gaming	3.0
IDM 221	Web Design I	3.0
PHTO 110	Photography	3.0
PHYS 170	Electricity and Motion	3.0
PHYS 171	Computational Lab for Electricity and Motion	1.0
	Term Credits	16.0
Term 5		
FMVD 206	Audio Production and Post	3.0
IDM 222	Web Design II	3.0
IDM 231	Scripting for Interactive Digital Media I	3.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
PSY 332	Human Factors and Cognitive Engineering	3.0
	Term Credits	16.0
Term 6		
ANIM 115	Introduction to Production with Animation & VFX	3.0
IDM 215	User Experience Design I	3.0
IDM 232	Scripting for Interactive Digital Media II	3.0
IDM 241	Microinteractions	3.0
IDM 418	Storytelling for User Experience Design	3.0
	Term Credits	15.0
Term 7		
ARTH 103	History of Art III: Modern Art	3.0
COM 230	Techniques of Speaking	3.0
COOP 101	Career Management and Professional Development	0.0
IDM 216	User Experience Design II	3.0
IDM 250	Content Management Systems	3.0
IDM Elective		3.0
	Term Credits	15.0
Term 8		
ARTH 300 [WI]	History of Modern Design	3.0
DIGM 475 [WI]	Seminar: The Future of Digital Media	3.0
IDM 371	Interactive Digital Media Workshop I	3.0
IDM Elective		6.0
	Term Credits	15.0
Term 9		
ARTH 314	Contemporary Art	3.0
IDM 372	Interactive Digital Media Workshop II	3.0
Arts & Humanities Elective		3.0
IDM Elective		3.0
Free Elective		3.0
	Term Credits	15.0
Term 10		
DIGM 490	Digital Media Senior Project	3.0
DIGM 491	Digital Media Senior Project Studio	1.0
IDM 401	Professional Practices in Interactive Digital Media	3.0
Literature (ENGL) Elective		3.0
Free Elective		6.0
	Term Credits	16.0
Term 11		
DIGM 490	Digital Media Senior Project	3.0
DIGM 491	Digital Media Senior Project Studio	1.0
History (HIST) Elective		3.0
Free Electives		6.0
	Term Credits	13.0
Term 12		
DIGM 490	Digital Media Senior Project	3.0
DIGM 491	Digital Media Senior Project Studio	1.0
Free electives		9.0
	Term Credits	13.0

Total Credit: 187.0

Co-op/Career Opportunities

Students who study interactive digital media can move on to careers as web designers, graphic designers, digital media designers, user research

& experience specialists, multimedia artists, interactive designers, web programmers, and web user interface designers.

Co-op Experiences

Some past co-op employers of interactive digital media students include:

- Brownstein Group
- Comcast
- Digitas Health
- eCity Interactive
- Electronic Ink
- Happy Cog

Visit the Drexel Steinbright Career Development Center (http://drexel.edu/scdc/) web page for more detailed information on co-op and post-graduate opportunities.

Dual Accelerated Degree

The accelerated degree program enables academically qualified students to earn both their bachelor's degree and a master's degree in digital media — graduating sooner than they would in traditional programs.

Current Drexel digital media students may apply for the accelerated BS/MS degree through the Graduate College after completing 90.0 credits, but no more than 120.0 credits. Contact the Graduate College (http://www.drexel.edu/graduatecollege/) for further information.

Facilities

Digital media program facilities include a motion capture and green screen studio, a screening room, DSLR digital still cameras, HD video cameras and lighting equipment, triple boot PowerMac stations (Mac / Windows / Unix) with dual monitors, wacom tablets, game consoles, mobile devices, and 2 undergraduate open labs with 24/7 access.

Additionally, the program houses the RePlay Lab (http://replay.drexel.edu/facilities.html) in the URBN Center which is a collaborative effort between the Digital Media program and the Computer Science department (in the College of Computing & Informatics). At Drexel University, game development does not "live" in solely one department, and so mirrors the true nature of game development in commercial settings.

Interactive Digital Media Faculty

Kurt Aspland, BFA *(Art Center College of Design)*. Adjunct Instructor. Illustrator, graphic designer and creative director

Chester Cunan, BS *(Drexel University)*. Adjunct Instructor.

Paul Diefenbach, PhD *(University of Pennsylvania)*. Associate Professor. Game development, real-time rendering.

Christopher Fernandez, BS *(Drexel University)*. Adjunct Instructor. Designer and illustrator in the world of interactive design creating innovative, exciting digital campaigns and solutions

Troy Finamore, MS *(Drexel University) Program Director, Interactive Digital Media*. Associate Teaching Professor. Advertising, design and interactivity.

Bernard Flakoff, BS *(Temple University)*. Adjunct Instructor. Creative content and strategic analytics for innovative and advanced technology platforms

Kevin Gross, MS *(Drexel University)*. Adjunct Instructor.

Nick Jushchyshyn, MFA *(Academy of Art University) Program Director, VR & Immersive Media*. Associate Professor. Visual effects, digital media and animation.

Jason Kirk, MS *(Drexel University)*. Adjunct Instructor.

Frank J. Lee, PhD *(Carnegie Mellon University)*. Professor. Human-computer interaction; cognitive engineering and science; intelligent software agents for games and education.

Robert Lloyd, MFA *(Temple University) Program Director, Game Design & Production*. Associate Teaching Professor. Game development, themed entertainment and motion simulation.

David Mauriello, BA *(Lafayette College)*. Assistant Professor. 3D modeling and animation.

Glen Muschio, PhD *(Temple University)*. Associate Professor. Digital media, society, communication.

Kenneth Oum, MS *(Drexel University)*. Professor. Computer interface gaming, web development, video production.

Mark Petrovich, MS *(Drexel University)*. Adjunct Instructor.

Stefan Rank, PhD *(Vienna University of Technology)*. Associate Professor. Artificial intelligence, game design and human-computer interaction.

Ryan Reed, BS *(Drexel University)*. Adjunct Instructor.

Patrick Richardson, MS *(Drexel University)*. Professor. Applied physics, electronics, software scripting, and physical computing.

Philip Sinatra, BS *(Drexel University)*. Professor. Website/application programming.

Jervis Thompson, BS *(Drexel University)*. Teaching Professor. Digital media, interactive multimedia.

Michael Wagner, PhD *(Vienna University of Technology) Program Director, Digital Media*. Associate Professor. Educational use of digital media and computer games.

Ed Yakovich, MS *(Philadelphia University)*. Professor. HTML/CSS/JS architecture and best practices.

Kenneth Yanoviak, BA *(Temple University)*. Adjunct Instructor. Digital photographer

Diane Zatz Adjunct Instructor.

Jichen Zhu, PhD *(Georgia Institute of Technology)*. Associate Professor. Developing humanistic and interpretive framework of computational technology, particularly artificial intelligence (AI), and constructing AI-based cultural artifacts; interactive storytelling, games and software studies.

Emeritus Faculty

Theo Artz, BFA *(Tyler School of Art, Temple University)*. Associate Professor. Digital media.

Interior Design

Major: Interior Design
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 186.0
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 50.0408
Standard Occupational Classification (SOC) code: 27-1025

About the Program

The undergraduate interior design program explores the behavioral, technological, environmental and aesthetic aspects of interior design within the context of increasingly more complex design projects. Combined with art and art history and general education requirements, a core of interior design courses creates a unique education at the forefront of design. Through academics grounded in problem-solving design studios, cooperative employment, and a dedicated faculty, the Interior Design program prepares students for leadership positions in the industry. The Interior Design program is consistently ranked among the top programs in the country, and in the survey by DesignIntelligence of "America's Best Design Schools."

The BS interior design program is CIDA (Council for Interior Design Accreditation) and NASAD (National Association of Schools of Art & Design) accredited.

Program Philosophy and Mission

The mission of the Interior Design program is to prepare students to enter the field of interior design as skilled designers, creative thinkers, professional leaders and responsible citizens. We cultivate students who acknowledge their responsibilities to the safety and well-being of the public and the stewardship of the environment to lead a multifaceted profession in an ever-changing world. The curriculum combines a studio-based design sequence with broad liberal arts study and experiential learning. Paired with a well-established professional co-op, the coursework is structured to build upon the fundamentals of interior design and to anticipate and reflect change in a continually evolving industry. The program encourages exploration and experimentation that fosters life-long learners who will contribute to the profession and the discipline's body of knowledge.

For more information about this major, visit the College's Interior Design (http://www.drexel.edu/westphal/academics/undergraduate/INTR/) page.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General education requirements		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
SOC 101	Introduction to Sociology	3.0
UNIV A101	The Drexel Experience	2.0
Required Arts and Humanities-students elect a minimum of 9 credits		9.0
Required Natural Science-students elect a minimum of 3 credits		3.0
Required Social Science-students elect a minimum of 6 credits		6.0
Free electives [*]		24.0
Visual studies requirements		
ARTH 101	History of Art I: Ancient to Medieval	3.0
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ARTH 103	History of Art III: Modern Art	3.0
VSST 101	Design I	4.0
VSST 102	Design II	4.0
VSST 103	Design III	4.0
VSST 110	Introductory Drawing	3.0
VSST 201	Multimedia: Performance	4.0
or VSST 202	Multimedia: Space	
VSST 203	Multimedia: Materials	4.0
VSST 301	Painting I	4.0
or VSST 311	Sculpture I	
Interior design requirements		
INTR 160	Visualization I: Computer Imaging	3.0
INTR 200	History of Modern Architecture and Interiors	3.0
INTR 211	Textiles for Interiors	3.0
INTR 220	Visualization II: Orthographic	3.0
INTR 225	Environmental Design Theory	3.0
INTR 231	Structure	4.0
INTR 232	Interior Studio I	4.0
INTR 233	Interior Studio II	4.0
INTR 241	Visualization III: Digital	3.0
INTR 245	Visualization IV: 3D Modeling	3.0
INTR 250	Interior Materials	3.0
INTR 300 [WI]	Visual Culture: Interiors	3.0
INTR 305 [WI]	Visual Culture: Furniture	3.0
INTR 331	Residential Design Studio	4.0
INTR 341	Visualization V: Methods	3.0
INTR 350	Interior Detailing	3.0
INTR 351	Interior Lighting	3.0
INTR 430	Commercial Design Studio	4.0
INTR 441	Furniture Design	4.0
INTR 442	Hospitality Design Studio	4.0
INTR 445	Contract Documentation for Interior Design	3.0
INTR 450 [WI]	Professional Practice	3.0
INTR 451	Interior Systems	3.0
INTR 491	Senior Project I	3.0
INTR 492	Senior Project II	3.0
INTR 493	Senior Project III	3.0
Total Credits		**186.0**

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the

sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plans of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Interior Design: Cycle A

(See Below for Cycle B plan of study)

Term 1		Credits
ARTH 101	History of Art I: Ancient to Medieval	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV A101	The Drexel Experience	1.0
VSST 101	Design I	4.0
	Term Credits	15.0
Term 2		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
UNIV A101	The Drexel Experience	1.0
VSST 102	Design II	4.0
VSST 110	Introductory Drawing	3.0
Arts & Humanities Elective		3.0
	Term Credits	17.0
Term 3		
ARTH 103	History of Art III: Modern Art	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
INTR 160	Visualization I: Computer Imaging	3.0
INTR 200	History of Modern Architecture and Interiors	3.0
VSST 103	Design III	4.0
	Term Credits	17.0
Term 4		
INTR 220	Visualization II: Orthographic	3.0
INTR 225	Environmental Design Theory	3.0
INTR 231	Structure	4.0
INTR 250	Interior Materials	3.0
Free Elective		3.0
	Term Credits	16.0
Term 5		

COOP 101	Career Management and Professional Development	0.0
INTR 232	Interior Studio I	4.0
INTR 241	Visualization III: Digital	3.0
INTR 300 [WI]	Visual Culture: Interiors	3.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
SOC 101	Introduction to Sociology	3.0
	Term Credits	17.0
Term 6		
INTR 211	Textiles for Interiors	3.0
INTR 233	Interior Studio II	4.0
INTR 245	Visualization IV: 3D Modeling	3.0
Natural science elective		3.0
Free elective		3.0
	Term Credits	16.0
Term 7		
INTR 305 [WI]	Visual Culture: Furniture	3.0
INTR 331	Residential Design Studio	4.0
INTR 341	Visualization V: Methods	3.0
INTR 350	Interior Detailing	3.0
VSST 202 or 201	Multimedia: Space Multimedia: Performance	4.0
	Term Credits	17.0
Term 8		
INTR 351	Interior Lighting	3.0
INTR 430	Commercial Design Studio	4.0
INTR 451	Interior Systems	3.0
VSST 203	Multimedia: Materials	4.0
Arts and humanities elective		3.0
	Term Credits	17.0
Term 9		
Arts and humanities elective		3.0
Social science elective		3.0
Free elecives		9.0
	Term Credits	15.0
Term 10		
INTR 442	Hospitality Design Studio	4.0
INTR 445	Contract Documentation for Interior Design	3.0
INTR 491	Senior Project I	3.0
VSST 301 or 311	Painting I Sculpture I	4.0
	Term Credits	14.0
Term 11		
INTR 441	Furniture Design	4.0
INTR 450 [WI]	Professional Practice	3.0
INTR 492	Senior Project II	3.0
Free electives		3.0
	Term Credits	13.0
Term 12		
INTR 493	Senior Project III	3.0
Free electives		6.0
Social Science Elective		3.0
	Term Credits	12.0

Total Credit: 186.0

Interior Design: Cycle B

Term 1		Credits
ARTH 101	History of Art I: Ancient to Medieval	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0

UNIV A101	The Drexel Experience	1.0
VSST 101	Design I	4.0
	Term Credits	15.0
Term 2		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
UNIV A101	The Drexel Experience	1.0
VSST 102	Design II	4.0
VSST 110	Introductory Drawing	3.0
Arts and humanities elective		3.0
	Term Credits	17.0
Term 3		
ARTH 103	History of Art III: Modern Art	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
INTR 160	Visualization I: Computer Imaging	3.0
INTR 200	History of Modern Architecture and Interiors	3.0
VSST 103	Design III	4.0
	Term Credits	17.0
Term 4		
INTR 220	Visualization II: Orthographic	3.0
INTR 225	Environmental Design Theory	3.0
INTR 231	Structure	4.0
INTR 250	Interior Materials	3.0
Free Elective		3.0
	Term Credits	16.0
Term 5		
COOP 101	Career Management and Professional Development	0.0
INTR 232	Interior Studio I	4.0
INTR 241	Visualization III: Digital	3.0
INTR 300 [WI]	Visual Culture: Interiors	3.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
SOC 101	Introduction to Sociology	3.0
	Term Credits	17.0
Term 6		
INTR 211	Textiles for Interiors	3.0
INTR 233	Interior Studio II	4.0
INTR 245	Visualization IV: 3D Modeling	3.0
Arts and humanities elective		3.0
Natural science elective		3.0
	Term Credits	16.0
Term 7		
INTR 305 [WI]	Visual Culture: Furniture	3.0
INTR 331	Residential Design Studio	4.0
INTR 341	Visualization V: Methods	3.0
INTR 350	Interior Detailing	3.0
VSST 203	Multimedia: Materials	4.0
	Term Credits	17.0
Term 8		
Social science elective		3.0
Free electives		12.0
	Term Credits	15.0
Term 9		
INTR 351	Interior Lighting	3.0
INTR 430	Commercial Design Studio	4.0
INTR 451	Interior Systems	3.0
VSST 202 or 201	Multimedia: Space / Multimedia: Performance	4.0
Free electives		3.0
	Term Credits	17.0
Term 10		
INTR 442	Hospitality Design Studio	4.0
INTR 445	Contract Documentation for Interior Design	3.0
INTR 491	Senior Project I	3.0
VSST 301 or 311	Painting I / Sculpture I	4.0
	Term Credits	14.0
Term 11		
INTR 441	Furniture Design	4.0
INTR 450 [WI]	Professional Practice	3.0
INTR 492	Senior Project II	3.0
Social science elective		3.0
	Term Credits	13.0
Term 12		
INTR 493	Senior Project III	3.0
Arts and humanities elective		3.0
Free elective		6.0
	Term Credits	12.0

Total Credit: 186.0

Co-op/Career Opportunities

Interior design is a multi-faceted field and includes careers with interior design firms, architectural firms, and facilities management organizations; in governmental agencies; and in the furniture and textile industries. Full-time paid employment in the profession is an integral component of the program at Drexel. The six-month co-operative education, undertaken in the junior year, provides project-based experience as well as the daily operation of a design firm. Students may opt to do their co-op in Philadelphia or in another location of their choosing. Through a required course and career advisement services offered by the Steinbright Career Development Center, students develop the ability to market themselves and obtain jobs in leading firms, worldwide.

Co-op Experiences

Some past co-op employers of interior design students include:

- Ballinger
- Children's Hospital of Philadelphia Facilities
- Daroff Design
- DAS
- Disney
- Eberlein Design Consultants
- Ewing Cole
- Floss Barber Inc.
- Gensler
- Hillier Lewis
- Herman Miller
- HOK
- Jacobs Associates
- Knoll International
- L2 Partridge
- Marguerite Rogers
- Nelson
- Perkins Eastman
- RJMJ

- Stantec
- University of Pennsylvania
- West Chester University

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

About the Accelerated Degree Program

Qualified students in Interior Design have the option of continuing into the graduate Interior Architecture + Design program to obtain a dual BS/MS degree. This program allows highly motivated students to graduate with both degrees in a total of five years. Students apply for this accelerated program when they complete 90.0 credits of coursework, and before completing 120.0 credits.

Additional requirements for acceptance into the Dual Degree Program:

- Overall GPA of undergraduate coursework – 3.2 minimum
- Overall GPA of interior design studio coursework – 3.5 minimum
- Portfolio Review: interior studio work and foundation visual work
- Essay: reason for application, professional goals and leadership qualities you possess
- Two letters of recommendation speaking to your work ethic and leadership skills

Evaluation Process

A committee of interiors faculty reviews the applications and discusses the merits of the student to undergo the intensity and rigor of the final two years of the program. The Committee consists of no less than three members – Director of the Interiors programs, Associate Director BS Interior Design program and the Associate Director MS Interior Architecture & Design program.

Students should visit the Westphal College of Media Arts and Design (http://www.drexel.edu/westphal/) for more information.

Facilities

The Interior Architecture program is housed in URBN Center, an original Venturi Scott Brown building enhanced by an award-winning retrofit by MS&R Design, including a skylight covered atrium, exposed beams and open spaces. There is a dedicated 24-hour graduate student studio, with storage space, computers, and a small lounge area. We have a materials library that is continually updated with samples from major manufacturers and local design offices and showrooms; two computer labs and in-house printing for the use of our students; a Hybrid Making Lab (http://drexel.edu/westphal/about/overview/making_spaces/HybridMakingLab/) with laser cutters, 3D printers, a CNC router and small-scale power tools for student use; and a larger shop facility which offers larger wood, metal, casting, CNC, and fabrication equipment.

The URBN Annex houses a black box theater, screening room and the Leonard Pearlstein Gallery (http://www.drexel.edu/pearlsteingallery/). Additional studio and classroom space in the Academic Building and the Design Arts Annex accommodate photography, basic design, painting, sculpture and a full woodworking shop with industrial-quality equipment.

Philadelphia, one of the nation's major design centers, gives interior design students the vitality of the contemporary arts at local galleries; easy access to many museums, libraries, renowned buildings, as well as design centers located in Philadelphia, New York City and Washington, D.C.

Architecture & Interiors Faculty

David Ade, AIA, LEED A.P., NCARB, BArch *(Drexel University)*. Adjunct Associate Professor. Principal, SMP Architects, sustainable design

Ulrike Altenmuller-Lewis, AIA, Dr.-Ing. *(Bauhaus Universitat Weimar)*. Associate Professor. Research on educational environments; translations of architectural theory texts.

Stephen Bonitatibus, AIA, MArch *(University of Pennsylvania)*. Adjunct Professor. Principal, Bonitatibus Associates; traditional residential architecture.

Anthony Bracali, AIA, LEED A.P., BArch *(Drexel University)*. Adjunct Associate Professor. President, Friday Architects; civic, non-profit and community-based architecture.

Mark Brack, PhD *(University of California at Berkeley)*. Associate Professor. British and American architecture from 1700 to the present; Hispanic colonial architecture in the American Southwest; vernacular architecture; historic preservation.

Daniel Chung, RA, PE, MArch, MSE *(Yale University, Princeton University)*. Associate Professor. Building performance and exterior envelope systems.

Jon Coddington, AIA, MArch *(University of Pennsylvania)*. Professor. Architecture, urban design and planning.

Rena Cumby, BArch, MS *(Drexel University)*. Associate Professor. Interior designer; foundation studies and design education.

John DeFazio, AIA, BArch *(New York Institute of Technology)*. Adjunct Professor. Architecture in film.

Katherine Dowdell, AIA, BS Interior Design *(Drexel University)*. Adjunct Assistant Professor. Principal, Farragut Street Architects; historic preservation

Eugenia Ellis, PhD, AIA *(Virginia Polytechnic Institute and State University)*. Professor. Natural and electric light sources and effects on biological rhythms and health outcomes; ecological strategies for smart, sustainable buildings of the nexus of health, energy and technology.

Dyer Alfred "Lyndsay" Falck, RA, ARCUK, ARIBA, NCARB, M.URP *(University of Capetown, South Africa)*. Adjunct Professor. Building technology

Jeff Fama, MArch *(State University of New York at Buffalo)*. Adjunct Associate Professor. Retail, entertainment, and theater design.

Susan Feenan, BArch *(Temple University)*. Adjunct Assistant Teaching Professor. Institutional and commercial architecture.

Gary Garofalo, BS Arch Eng *(Pennsylvania State University)*. Adjunct Assistant Professor. Principal Lighting Design Collaborative; lighting expert, lighting design.

Alan Greenberger, FAIA *(Rensselaer Polytechnic Institute) Department Head, Architecture, Design & Urbanism*. Distinguished Teaching Professor. Urban planning, economic development, urban governance

Don Jones, FAIA, LEED DD+C, MArch *(University of Pennsylvania)*. Adjunct Professor. Principal, Director of Sustainable Design, Ewing Cole; sports venues.

Tim Kearney, AIA, MArch *(University of Pennsylvania)*. Adjunct Professor. Principal, CuetoKEARNEY design; sustainable design

Nicole Koltick, MArch *(University of California, Los Angeles) Director, Design Futures Lab*. Associate Professor. Researching possibilities for architecture and design through the use of unexpected and innovative interdisciplinary models; computational design, digital fabrication, contemporary form making, design research, philosophy and theory of design, speculative design

Jeffrey Krieger, AIA, LEED AP, MArch *(Carnegie Mellon University)*. Adjunct Associate Professor. President, Krieger and Associates Architects; residential design.

Karin Kuenstler, MS *(Bank Street College of Education and Parsons) Associate Dean for Research and Graduate Studies*. Associate Professor. Interior design for corporate and commercial facilities.

Maria Kuttruff, MS *(Drexel University)*. Adjunct Assistant Professor. Owner/Principal, Viola Interior Design, LLC. Residential interior design.

Robert Nalls, AIA, NCARB, MArch *(University of Pennsylvania)*. Adjunct Professor. Principal, Nalls Architecture Inc.; institutional and educational buildings.

Diana S. Nicholas, RA, AIA, NCARB, MFA *(University of the Arts, Philadelphia) Director of MS Design Research, Coordinator, Sustainability in the Built Environment Minor*. Assistant Professor. Coordinator, Sustainability in the Built Environment Researching Health in residential urban environment and interprofessional collaboration

Jacklynn Niemiec, LEED BD+C, MArch *(University of Pennsylvania)*. Assistant Teaching Professor. Graphic representation

James Rowe, AIA, MArch *(University of Pennsylvania)*. Adjunct Associate Professor. Principal, Studio Agoos Lovera; institutional, recreation, corporate, civic and residential design.

Debra Ruben, NCIDQ, IDEC, LEED AP, MS *(Drexel University) Academic Associate Dean; Interim Associate Dean, Graduate Studies*. Associate Professor. Interior design

Paul Salvaggio, AIA, LEED AP, NCARB, BArch, BS Arch *(Pennsylvania State University)*. Adjunct Assistant Professor. Principal, Arcus Design Group; residential architecture.

Rachel Schade, AIA, MArch *(University of Pennsylvania) Program, Architecture, Associate Director for Student Placement*. Associate Teaching Professor. Principal, Rachel Simmons Schade Architect. Work-study placement; residential, graphic representation.

Harris Steinberg, FAIA, MArch *(University of Pennsylvania) Executive Director, Lindy Institute for Urban Innovation*. Distinguished Teaching Professor. Urban design and civic engagement.

Frances Temple West, AIA, NCARB, LEED GA, MArch *(Virginia Tech)*. Assistant Teaching Professor. Principal, Frances Temple-West Architect; Retail, Corporate/Commercial, and Residential design

Frances Temple-West, AIA, NCARB, LEED GA, MArch *(Virginia Tech)*. Assistant Teaching Professor. Principal, Frances Temple-West Architect; retail, corporate/commercial, and residential design

Simon Tickell, AIA, MArch *(University of Pennsylvania)*. Associate Teaching Professor. Principal, Simon J Tickell Architect; educational and museum buildings, residential design

Nancy Trainer, FAIA, AICP, LEED, AFAAR, MArch *(University of Pennsylvania) Associate Vice President of Design & Planning at Drexel*. Adjunct Teaching Professor. Planning, institutional design.

Ada Tremonte, NCIDQ, IDEC, IIDA, MS *(Drexel University) Director, BS Interior Design*. Teaching Professor. President, a d a Design Associates, Inc.; educational and corporate/commercial design

Emeritus Faculty

Judith Bing, MArch *(Yale University)*. Professor Emeritus. Research on traditional architecture of the Balkins and Anatolia

Sylvia Clark, MArch *(University of Pennsylvania)*. Professor Emeritus.

Paul M. Hirshorn, FAIA, MArch, MCP, *(University of Pennsylvania)*. Professor Emeritus.

Marjorie Kriebel, BArch *(University of Pennsylvania)*. Professor Emeritus.

Music Industry

Major: Music Industry
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 187.0
Co-op Options: Two Co-ops (Four years)
Classification of Instructional Programs (CIP) code: 50.1003
Standard Occupational Classification (SOC) code: 27-2041; 25-1121

About the Program

The degree in music industry offers the highly motivated student a program of study that combines education in music, music industry practices, and music technology with career preparation. Two concentrations are offered—Music Industry Business and Recording Arts (MIBU) and Music Production (RAMP)—providing hands-on experience and a strong academic foundation in relevant areas of this rapidly changing industry. The music industry curriculum is divided into four areas which are combined with cooperative experience: general education, music core, music industry core, and concentration requirements.

In an industry where the process of career building often begins with a few key contacts, the cooperative education program provides Drexel students the opportunity to meet industry professionals and network. The program prepares students for careers in the music industry in such diverse positions as recording engineer, music producer, sound designer, music lawyer, business manager or music publisher. The co-op experience during the sophomore and junior year summer terms involves full-time career-related employment, during which students gain valuable insight into how the entertainment industry works.

About the Concentrations

The major offers two concentrations: Music Industry Business and Recording Arts (MIBU) and Music Production (RAMP):

- The **Music Industry Business (MIBU)** concentration provides a rigorous academic foundation complemented by a real-world hands-on, highly-intensive business experience. This mission is realized through the students' participation in the MAD Dragon Music Group, a group of student-run enterprises including: MAD Dragon Records, MAD Dragon Live, MAD Dragon Publishing, and MAD Dragon Marketing.

- The **Recording Arts and Music Production (RAMP)** concentration focuses on the techniques and technologies of music and audio production. As well as providing the technology-oriented student with the necessary skills to perform as an audio engineer or record producer, the concentration teaches students a full range of industry functions including post-production audio, live sound engineering, and music and audio freelancing skills. The concentration encourages the technology student to interact with the students in the business concentration by recording, mixing and mastering the music for MAD Dragon Music Group projects, and engaging in live performance production.

All Music Industry students qualify to apply for a minor in business administration after completing their music industry core requirements. This emphasis on business courses as part of the core requirements is one of the foundations of the program.

Special Admissions Considerations

Students wishing to be admitted to the music industry major must meet or exceed the general requirements for admission to the University and the College of Media Arts and Design.

The program no longer accepts hard-copy portfolios. However, when applying to the Music Industry program, applicants are encouraged to use the portfolio portal provided on the Admissions Instructions webpage to upload electronic examples of pertinent activities (music and/or business and entrepreneurial), as well as a resume of music industry related experience.

In their major-specific essays, applicants should address their reasons for selecting the music industry major at Drexel and share their passion for this unique area of study.

For more information about this major, visit the College's Music Industry (http://www.drexel.edu/westphal/academics/undergraduate/MIP/) page.

Degree Requirements

All students take the same general education, music industry core and business courses. Students choose their concentration at the time of admission; however it is possible to switch as late as the beginning of junior year.

Concentrations:

- Music Industry: Business (MIBU) Concentration
- Music Industry: Recording Arts & Music Production (RAMP) Concentration

Students are also able to take courses in any other concentration as long as they fulfill the prerequisite requirement(s) and there is room in the class to accommodate the student.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Requirements

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
COM 230	Techniques of Speaking	3.0
MATH 101	Introduction to Analysis I	4.0
or MATH 121	Calculus I	
MATH 102	Introduction to Analysis II	4.0
or MATH 122	Calculus II	
CIVC 101	Introduction to Civic Engagement	1.0
UNIV A101	The Drexel Experience	1.0
Required Arts and Humanities-students elect a minimum of 9 credits		9.0
Required Natural Science-students elect a minimum of 3 credits [*]		3.0
Required Social Science-students elect a minimum of 9 credits		9.0
Music core requirements		15.0
Music Industry core requirements		63.0
Concentration requirements		33.0-34.0
Concentration electives		9.0
Free electives [**]		24.0
Total Credits		187.0-188.0

[*]   PHYS 107 - Acoustics is recommended.

[**]   MKTG 301, PHIL 301, PSY 101 and/or PSY 150 are recommended.

Music Core Requirements

MUSC 121	Music Theory I	3.0
or MUSC 122	Music Theory II	
MUSC 125	Ear Training I	1.0
MUSC 130	Introduction to Music	3.0
MUSC 190	Class Piano I	2.0
or MUSC 191	Class Guitar I	
MUSC 323	Songwriting	3.0
Music Elective (Select one)		**3.0**
MUSC 231	Music History I	
MUSC 232	Music History II	
MUSC 234	The Beatles	
MUSC 236	Rock Music Through the Mid-60s	
MUSC 238	Rock Music Since the Mid-60s	
MUSC 331	World Musics	
MUSC 333	Afro-American Music USA	
MUSC 336	History of Jazz	
MUSC 338 [WI]	American Popular Music	
MUSC T380	Special Topics in Music	
Total Credits		15.0

Music Industry Core Requirements

ACCT 110	Accounting for Professionals	4.0
BLAW 201	Business Law I	4.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
MIP 132	Survey of the Recording Industry	3.0
MIP 133	Digital Audio Workstations I	3.0
MIP 161	Copyrights in the Music Industry	3.0
MIP 179	Introduction to Sound Recording	2.0

MIP 227	Listening Techniques	1.0
MIP 270	Live Music Industry	3.0
MIP 293 [WI]	Survey of Music Production	3.0
MIP 361	Music Publishing	3.0
MIP 374	Entrepreneurship in the Music Industry	3.0
MIP 375 [WI]	Marketing and Promo in Music Industry	3.0
MIP 491	Senior Project in Music Industry [*]	9.0
STAT 201	Introduction to Business Statistics	4.0
WEST 100	Introduction to Digital Design Tools	3.0
Total Credits		63.0

[*]   Repeated over three terms.

Music Industry: Business Concentration Requirements

MIP 276	Sound Recording for Business Concentration [*]	3.0
MIP 336	Contracts and Legal Issues in the Music Industry	3.0
MIP 376	MAD Dragon Music Group (Taken three terms)	9.0
MIP 394	Big Data In The Music Industry	3.0
MIP 395	Digital Revenue & Creative Destruction	3.0
MIP 396	Global Recording Business	3.0
MIP 426	Global Trends in the Music Industry	3.0
MIP 467	Artist Representation	3.0
MIP 468	Music Industry E-Commerce	3.0
Select Three of the following Business Concentration Electives		**9.0**
MIP 170	Radio Management	
MIP 263	Media Promotion	
MIP 318	Music Merchandising	
MIP 331	Music Venues and Concerts	
MIP 341	Touring and Booking	
MIP 365	Cities of Music and Culture	
MIP 366	Music Supervision	
Total Credits		42.0

[*]   MUSI Business Concentration Students who would like to continue taking more advanced recording studio and music production courses should take MIP 279 *Sound Recording I* instead of MIP 276 *Sound Recording* for Business Concentration. Take MIP 233 in Term 3 instead of MIP 276, which is a prerequisite to MIP 279, which you will take in Terms 5 or 6.

Music Industry: Recording Arts & Music Production (RAMP) Concentration Requirements

MIP 233	Digital Audio Workstations II	3.0
MIP 279	Sound Recording I	3.0
MIP 333	Digital Audio Workstations III	3.0
MIP 338	Audio Seminar	2.0
MIP 379	Sound Recording II	3.0
MIP 381	Audio for Video	3.0
MIP 388	Music and Audio Freelancing	2.0
MIP 389	Sound Reinforcement	3.0
MIP 477	Music Production	3.0
MIP 481	Mixing and Mastering	3.0
MUSC 122	Music Theory II	3.0
MUSC 229	Modern Arranging Techniques	3.0
Select Three of the following RAMP Concentration electives:		**9.0**
MIP 358	Electronic Music Production	
MIP 382	Scoring to Picture	
MIP 384	Synthesis and Sampling	
MIP 386	Commercial Music Production	
MIP 387	Studio Maintenance	
MIP 390	Video Game Music and Audio	
MIP 391	Analog Recording	

MIP 392	Music Production Master Class	
MIP 433	Digital Audio Workstations IV	
Total Credits		43.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

About the Accelerated Degree Program

The BS in Music Industry/MBA program offers students a program that combines an undergraduate degree in music business and technology with an MBA degree awarded by the Drexel LeBow College of Business. The program is designed to allow students to complete both the bachelor's degree and the Master of Business Administration degree in five years.

The program is offered to qualified students who apply for this option prior to the end of freshmen year or prior to the completion of 90 credits. All students who apply for this option must take the GMAT entrance exam.

Students selected for this program will generally have a minimum of 1350 on the SAT, a GPA of 3.5 or better, and rank in the top 10% of their high school graduating class. A strong candidate for this program will have taken significant AP coursework while in high school.

BS/MBA students may be waived from two MBA Enterprise Management courses, assuming a grade of B or better is earned in specified undergraduate courses. Students can review the Waiver Policies for the Statement of Curriculum Standing on the LeBow College's website for additional information.

The above conditions hold only for fully accepted BS/MBA students as identified by Enrollment Management.

Additional requirements for the dual degree program:

- A minimum of 3.2 cumulative GPA must be maintained throughout the entire undergraduate portion of this program or the student will not be able continue on to the MBA.
- Students must take the GMAT examination and achieve a minimum score of 570 prior to the end of the tenth term in order to continue in the program. It is recommended that students take the GMAT examination late in the student's third year.

- Students must submit an acceptable of plan of study at least three terms before anticipated start of graduate part of the program.

Sample Plans of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Music Industry: Recording Arts & Music Production Concentration

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MIP 132	Survey of the Recording Industry	3.0
MIP 179	Introduction to Sound Recording	2.0
MIP 227	Listening Techniques	1.0
MUSC 121	Music Theory I	3.0
MUSC 190 or 191	Class Piano I Class Guitar I	2.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	15.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MIP 133	Digital Audio Workstations I	3.0
MIP 161	Copyrights in the Music Industry	3.0
MUSC 130	Introduction to Music	3.0
WEST 100	Introduction to Digital Design Tools	3.0
	Term Credits	16.0
Term 3		
ACCT 110	Accounting for Professionals	4.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MIP 233	Digital Audio Workstations II	3.0
MIP 270	Live Music Industry	3.0
MUSC 122	Music Theory II	3.0
MUSC 125	Ear Training I	1.0
	Term Credits	17.0
Term 4		
COOP 101	Career Management and Professional Development	0.0
MATH 101 or 121	Introduction to Analysis I Calculus I	4.0
MIP 333	Digital Audio Workstations III	3.0
MIP 361	Music Publishing	3.0
MIP 375 [WI]	Marketing and Promo in Music Industry	3.0
Free elective		3.0
	Term Credits	16.0
Term 5		
ECON 201	Principles of Microeconomics	4.0
MATH 102 or 122	Introduction to Analysis II Calculus II	4.0
MIP 279[*]	Sound Recording I	3.0
MIP 293 [WI]	Survey of Music Production	3.0
Free electives		3.0
	Term Credits	17.0
Term 6		
BLAW 201	Business Law I	4.0
MIP 279[**]	Sound Recording I	3.0

MUSC 229	Modern Arranging Techniques	3.0
MUSC 323	Songwriting	3.0
STAT 201	Introduction to Business Statistics	4.0
	Term Credits	17.0
Term 7		
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
MIP 379	Sound Recording II	3.0
MIP 381	Audio for Video	3.0
Arts & Humanities elective		3.0
	Term Credits	17.0
Term 8		
MIP 374	Entrepreneurship in the Music Industry	3.0
MIP 389	Sound Reinforcement	3.0
Social Science elective		3.0
MIP 388	Music and Audio Freelancing	2.0
MIP 481	Mixing and Mastering	3.0
	Term Credits	14.0
Term 9		
COM 230	Techniques of Speaking	3.0
PHYS 107[***]	Acoustics	3.0
MIP 338	Audio Seminar	2.0
MIP 477	Music Production	3.0
Social Science elective		3.0
	Term Credits	14.0
Term 10		
MIP 491	Senior Project in Music Industry	3.0
MIP RA&MP Concentration elective		3.0
Arts and Humanities elective		3.0
MUSC elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 11		
MIP 491	Senior Project in Music Industry	3.0
Free electives		6.0
MIP RA&MP Concentration elective		3.0
Social Science elective		3.0
	Term Credits	15.0
Term 12		
MIP 491	Senior Project in Music Industry	3.0
MIP RA&MP Concentration elective		3.0
Arts and Humanities elective		3.0
Free elective		6.0
	Term Credits	15.0

Total Credit: 188.0

[*]   Can substitute with free elective.

[**]   Can substitute with Natural Science elective

[***]   Can substitute with Social Science elective

Music Industry: Business Concentration

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MIP 132	Survey of the Recording Industry	3.0
MIP 179	Introduction to Sound Recording	2.0
MIP 227	Listening Techniques	1.0
MUSC 121	Music Theory I	3.0
MUSC 190 or 191	Class Piano I Class Guitar I	2.0

UNIV A101	The Drexel Experience	1.0
	Term Credits	15.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
MIP 133	Digital Audio Workstations I	3.0
MIP 161	Copyrights in the Music Industry	3.0
MUSC 130	Introduction to Music	3.0
WEST 100	Introduction to Digital Design Tools	3.0
	Term Credits	16.0
Term 3		
ACCT 110	Accounting for Professionals	4.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
MIP 270	Live Music Industry	3.0
MIP 276**	Sound Recording for Business Concentration	3.0
MUSC 125	Ear Training I	1.0
Free Elective		3.0
	Term Credits	17.0
Term 4		
COOP 101	Career Management and Professional Development	0.0
MATH 101	Introduction to Analysis I	4.0
MIP 361	Music Publishing	3.0
MIP 375 [WI]	Marketing and Promo in Music Industry	3.0
Natural science elective		3.0
Free elective		3.0
	Term Credits	16.0
Term 5		
BLAW 201	Business Law I	4.0
ECON 201	Principles of Microeconomics	4.0
MATH 102	Introduction to Analysis II	4.0
MIP 293 [WI]	Survey of Music Production	3.0
Social Science elective		3.0
	Term Credits	18.0
Term 6		
MIP 336	Contracts and Legal Issues in the Music Industry	3.0
MIP 467	Artist Representation	3.0
MUSC 323	Songwriting	3.0
STAT 201	Introduction to Business Statistics	4.0
Social Science elective		3.0
	Term Credits	16.0
Term 7		
ECON 202	Principles of Macroeconomics	4.0
FIN 301	Introduction to Finance	4.0
MIP 376	MAD Dragon Music Group	3.0
MIP 395	Digital Revenue & Creative Destruction	3.0
MIP Business Concentration elective		3.0
	Term Credits	17.0
Term 8		
MIP 374	Entrepreneurship in the Music Industry	3.0
MIP 376	MAD Dragon Music Group	3.0
MIP 394	Big Data In The Music Industry	3.0
Free electives		6.0
	Term Credits	15.0
Term 9		
COM 230	Techniques of Speaking	3.0
MIP 376	MAD Dragon Music Group	3.0
MIP 426	Global Trends in the Music Industry	3.0
MIP 468	Music Industry E-Commerce	3.0
Arts & Humanities elective		3.0
	Term Credits	15.0
Term 10		
MIP 396	Global Recording Business	3.0
MIP 491	Senior Project in Music Industry	3.0
Arts and Humanities elective		3.0
MUSC elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 11		
MIP 491	Senior Project in Music Industry	3.0
MIP Business Concentration elective		3.0
Social science elective		3.0
Free electives		6.0
	Term Credits	15.0
Term 12		
MIP 491	Senior Project in Music Industry	3.0
MIP Business Concentration elective		3.0
Arts and Humanities elective		3.0
Free electives		3.0
	Term Credits	12.0

Total Credit: 187.0

*   See degree requirements (p. 550).

** MUSI Business Concentration Students who would like to continue taking more advanced recording studio and music production courses should take MIP 279 *Sound Recording I* instead of MIP 276 *Sound Recording* for Business Concentration. Take MIP 233 in Term 3 instead of MIP 276, which is a prerequisite to MIP 279, which you will take in Terms 5 or 6.

Music Industry Faculty

James L. Klein, BA *(Oberlin College)*. Associate Professor. Music technologist, sound and recording engineer, songwriter for film, TV and radio music.

Marc Offenback, BA *(CUNY)*. Assistant Teaching Professor. Recognized leader and innovator in label management, digital and traditional marketing and artist development.

Ryan Schwabe, BA *(Drexel University)*. Assistant Teaching Professor. Musician, producer, sound engineer, programmer and upright bass player. Owner of RareMP3s LLC and guest lecturer at Curtis Institute of Music.

Toby Seay, BMus *(James Madison University) Department Head, Arts & Entertainment Enterprise*. Professor. Sound and recording engineer, music technologist, music producer and studio technician.

Cyrille Taillandier Associate Teaching Professor. Recording engineer, music producer and digital editor.

Darren Walters, BA *(University of Delaware)*. Associate Teaching Professor. General Manager of Mad Dragon Records and co-owner and President of Jade Tree, an independent record label.

Robert Weitzner, MBA *(Harvard Business School)*. Assistant Professor. Has over 20 years of industry experience at the nexus of music, digital media, and technology. Founding Director of the American Association of Independent Music (A2IM) and currently the Head of North America for Consolidated Independent (CI) a London based digital supply chain and asset management solutions provider for the global independent music industry.

Photography

Major: Photography
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.0
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 50.0605
Standard Occupational Classification (SOC) code: 27-4021

About the Program

The Drexel University Photography program teaches students how to develop a unique photographic vision using a combination of aesthetics and technology. Using both applied and theoretical teaching methods and blending traditional processes with current digital technologies, the photography curriculum provides aspiring photographers with the breadth of experience and knowledge required to succeed in today's marketplace.

The photography foundation courses are the same for each student until their third year, at which point they design a custom path of study that culminates in their senior thesis portfolio. Our alumni's achievements reflect the diversity built into our program. They own successful photography studios, teach in high school and college programs, serve as curators, work as magazine photo editors and operate their own digital illustration firms.

The College's extensive photographic facilities (http://www.drexel.edu/westphal/undergraduate/PHTO/Facilities/) are available to every photography major at Drexel.

Additional Information

For more information about this major, visit the College's Photography (http://www.drexel.edu/westphal/undergraduate/PHTO/) website.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General education requirements		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 119	Mathematical Foundations for Design	4.0
COOP 101	Career Management and Professional Development	0.0
UNIV A101	The Drexel Experience	2.0
Required Arts and Humanities-students elect a minimum of 9 credits		9.0
Required Natural Science-students elect a minimum of 7 credits		7.0
Required Social Science-students elect a minimum of 9 credits		9.0
Free electives		**27.0**
Visual Studies requirements		
ARTH 101	History of Art I: Ancient to Medieval	3.0
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ARTH 103	History of Art III: Modern Art	3.0
VSST 101	Design I	4.0
VSST 102	Design II	4.0
VSST 110	Introductory Drawing	3.0
VSST 111	Figure Drawing I	3.0
Visual Studies electives		**12.0**
Students select three additional visual studies (VSST) courses as electives.		
Photography requirements		
PHTO 110	Photography	3.0
PHTO 140	Digital Photography I	4.0
PHTO 210	Intermediate Photography	3.0
PHTO 231	Color Photography	4.0
PHTO 233	Large Format Photography	4.0
PHTO 234	Studio Photography	4.0
PHTO 236	Photojournalism	4.0
PHTO 240	Digital Photography II	4.0
PHTO 253	Fine Black & White Printing	3.0
PHTO 275 [WI]	History of Photography I	3.0
PHTO 276 [WI]	History of Photography II	3.0
PHTO 334	Advanced Studio Photography	4.0
PHTO 340	Digital Photography III	4.0
PHTO 361	Advanced Photography	4.0
PHTO 392	Junior Project in Photography	3.0
PHTO 451	Photography and Business	3.0
PHTO 452 [WI]	History of Contemporary Photography	3.0
PHTO 492	Senior Thesis in Photography I	3.0
PHTO 493	Senior Thesis in Photography II	3.0
PHTO 495	Senior Thesis in Photography III	3.0
Photography electives		**9.0**
Students select three courses from the following:		
PHTO 335	Portraiture	
PHTO 453	Photography Production	
PHTO 455	Landscape Photography	
PHTO 456	Fashion Photography	
PHTO 457	Palladium Printing	
PHTO 458	Advertising Portfolio Development	
PHTO 459	Marketing for Photographers	
Total Credits		180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
ARTH 101	History of Art I: Ancient to Medieval	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
PHTO 140	Digital Photography I	4.0
VSST 101	Design I	4.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	15.0
Term 2		
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
PHTO 110	Photography	3.0
VSST 102	Design II	4.0
UNIV A101	The Drexel Experience	1.0
Natural Science		4.0
	Term Credits	15.0
Term 3		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 119	Mathematical Foundations for Design	4.0
PHTO 210	Intermediate Photography	3.0
Natural Science		3.0
	Term Credits	16.0
Term 4		
PHTO 253	Fine Black & White Printing	3.0
ARTH 103	History of Art III: Modern Art	3.0
PHTO 233	Large Format Photography	4.0
VSST 110	Introductory Drawing	3.0
Free elective		3.0
	Term Credits	16.0
Term 5		
COOP 101	Career Management and Professional Development	0.0
PHTO 234	Studio Photography	4.0
PHTO 240	Digital Photography II	4.0
PHTO 275 [WI]	History of Photography I	3.0
Social science elective		3.0
Free elective		3.0
	Term Credits	17.0
Term 6		
PHTO 231	Color Photography	4.0
PHTO 276 [WI]	History of Photography II	3.0
VSST 111	Figure Drawing I	3.0
Arts and Humanitites elective		3.0
Social science elective		3.0
	Term Credits	16.0
Term 7		
PHTO 236	Photojournalism	4.0
PHTO 451	Photography and Business	3.0
VSST elective*		4.0
Free elective		3.0
	Term Credits	14.0
Term 8		
PHTO 334	Advanced Studio Photography	4.0
PHTO 361	Advanced Photography	4.0
PHTO 392	Junior Project in Photography	3.0
Arts and Humanitites elective		3.0
VSST elective*		4.0
	Term Credits	18.0
Term 9		
Arts and Humanities elective		3.0
Free elective		3.0
Social science elective		3.0
VSST elective*		4.0
	Term Credits	13.0
Term 10		
PHTO 452 [WI]	History of Contemporary Photography	3.0
PHTO 492	Senior Thesis in Photography I	3.0
Photography elective*		3.0
Free electives		6.0
	Term Credits	15.0
Term 11		
Photography elective*		3.0
Free electives		6.0
PHTO 493	Senior Thesis in Photography II	3.0
	Term Credits	12.0
Term 12		
PHTO 340	Digital Photography III	4.0
PHTO 495	Senior Thesis in Photography III	3.0
Photography elective*		3.0
Free elective		3.0
	Term Credits	13.0

Total Credit: 180.0

*   See degree requirements (p. 554).

Co-op/Career Opportunities

Photographers pursue careers in a wide variety of fields. Primary choices among Drexel graduates include journalism, illustration, fashion and advertising, and fine arts.

Recent co-op placements have included:

- Micheal Creagh, New York City
- The Edywnn Houk Gallery, New York City
- Jonathan Pushnik, Advertising Photographer, Philadelphia, PA
- Philadelphia Magazine, Philadelphia, PA
- Jason Varney, Editorial Photographer, Philadelphia
- Saturday Night Live, New York City

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Photography Faculty

Noah Addis, BS *(Drexel University).* Adjunct Instructor. Photographing informal settlements and unplanned growth in the world's major cities

Julia Cybularz, MFA *(The School of Visual Arts).* Adjunct Instructor. Photography; color photography, junior project in photography, advanced DSLR.

Michael Froio, BS *(Drexel University).* Adjunct Instructor. Photography; intermediate photography and fine black and white printing.

Niko Kallianiotis, MFA *(School of Visual Arts)*. Adjunct Instructor. Photography; intermediate photography and photojournalism.

George McCardle, BS *(Drexel University)*. Adjunct Instructor. Digital Photography III

Andrea Modica, MFA *(Yale University)*. Professor. Photography; portraiture, photojournalism, palladium printing, and thesis.

Joy Moody, BS *(Drexel University)*. Adjunct Instructor. Portraits

Eddy Rhenals, MFA *(University of Delaware)*. Adjunct Instructor.

Stuart Rome, MFA *(Arizona State University)*. Professor. Photography; color photography, junior project, and thesis.

Diana Rossi, M.Ed *(Arcadia University)*. Adjunct Instructor. Photography and intermediate photography.

Paul Runyon, BFA *(The University of New Mexico) Program Director, Photography*. Associate Professor. Studio photography, view-camera photography, studio lighting, business aspects of photography.

Ashley Smith, MFA *(School of Visual Arts)*. Adjunct Instructor. Photography

Amanda Tinker, MFA *(Temple University)*. Assistant Teaching Professor. Photography, history of photography, historical and alternative processes, and intermediate photography.

Bruce Wartman, MS *(Saint Joseph's University)*. Adjunct Instructor. Photography

L. Kylie Wright, BA *(University of Virginia)*. Assistant Teaching Professor. Photography; digital photography, and master printing.

Product Design

Major: Product Design
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 187.0
Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 50.0404
Standard Occupational Classification (SOC) code: 27-1021; 25-1121; 27-1024; 27-1029

About the Program

Product design combines the fields of art, business, and engineering to design the products people use every day. The program in product design focuses creativity and intellect, and prepares students for careers in a range of product design fields including corporate product design, design consulting, entrepreneurial endeavors, sustainable product development, and global design initiatives.

The major in product design is centered on teaching students the skills to develop and design products for a vast array of industries, specializing in multidisciplinary design research focused on product development and commercialization. It will also encourage collaboration in green design, sustainability and innovation in product development, facilitating and combining the fields of art, business, engineering and technology.

Students have the opportunity to create products ranging from furniture and toys to medical devices and consumer electronics in design competitions and *charrettes.* Students learn in state-of-the-art facilities that include a modeling shop and studio, laser cutters, 3D printers, rapid prototypers and molding clays and tools. The modeling shop and studio are large design-centered spaces, built to promote and sustain the studio culture students will enter upon graduation.

Students enrolled in the product design major will be expected to pursue a minor outside of product design that will allow them to apply their design capabilities toward a specific area of expertise.

For more information about this major, visit the College's Product Design (http://www.drexel.edu/westphal/academics/undergraduate/PROD/) page.

Degree Requirements

In addition to the following requirements for graduation, students enrolled in the Product Design major will be expected to pursue a minor outside of product design that will allow them to apply their design capabilities toward a specific area of expertise.

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General education requirements		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
CHEM 201	Why Things Work: Everyday Chemistry	3.0
COM 220	Qualitative Research Methods	3.0
MATH 101	Introduction to Analysis I	4.0
PHYS 170	Electricity and Motion	3.0
PHYS 171	Computational Lab for Electricity and Motion	1.0
PSY 101	General Psychology I	3.0
PSY 332	Human Factors and Cognitive Engineering	3.0
CIVC 101	Introduction to Civic Engagement	1.0
UNIV A101	The Drexel Experience	1.0
Required Arts and Humanities-students elect a minimum of 6 credits		6.0
Required Social Science-students elect a minimum of 3 credits		3.0
Free electives		27.0
Visual studies requirements		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ARTH 103	History of Art III: Modern Art	3.0
ARTH 300 [WI]	History of Modern Design	3.0
DIGM 100	Digital Design Tools	3.0
PHTO 110	Photography	3.0
PHTO 234	Studio Photography	4.0
VSCM 230	Visual Communication I	4.0
VSCM 240	Typography I	3.0
VSST 101	Design I	4.0
VSST 102	Design II	4.0
VSST 103	Design III	4.0
VSST 110	Introductory Drawing	3.0
VSST 111	Figure Drawing I	3.0
Select one of the following:		4.0
VSST 201	Multimedia: Performance	
VSST 202	Multimedia: Space	
VSST 203	Multimedia: Materials	
Product Design requirements		

ECON 201	Principles of Microeconomics	4.0
DSMR 201	Analysis of Product	3.0
MATE 120	Modern Materials in Your World	3.0
MATE 121	Mechanical Behavior of Materials for Product Design	1.0
MEM 201	Foundations of Computer Aided Design	3.0
MGMT 260	Introduction to Entrepreneurship	4.0
PROD 101	History and Analysis of Product Design	3.0
PROD 205	Applied Making I	3.0
PROD 210	Introduction to Product Design	3.0
PROD 220	Product Design Form Studio	4.0
PROD 225	Computer Aided Imagining in Product Design	3.0
PROD 230	Product Design Process Studio	4.0
PROD 235	Applied Design Visualization	3.0
PROD 245	Seminar Professional Landscape	3.0
PROD 255	Applied Materials in Product Design	3.0
PROD 340	Interdisciplinary Product Design Studio	4.0
PROD 345	Applied Human Centered Design	3.0
PROD 425	Applied Design Research	3.0
PROD 460	Research Synthesis Studio	4.0
PROD 470	Create Build Studio	4.0
PROD 475	Professional Practice in Product Design	3.0
PROD 480	Exhibition Studio	4.0
Optional Product Design electives		
PROD 215	Design Thinking in Product Design	
PROD 350	Sponsored Product Design Studio	
PROD T180	Special Topics in Product Design	
PROD T280	Special Topics in Product Design	
PROD T380	Special Topics in Product Design	
PROD T480	Special Topics in Product Design	
PROD I199	Independent Study in Product Design	
PROD I299	Independent Study in Product Design	
PROD I399	Independent Study in Product Design	
PROD I499	Independent Study in Product Design	
Total Credits		187.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		**Credits**
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
PROD 101	History and Analysis of Product Design	3.0
UNIV A101	The Drexel Experience	1.0
VSST 101	Design I	4.0
VSST 110	Introductory Drawing	3.0
	Term Credits	14.0
Term 2		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
CIVC 101	Introduction to Civic Engagement	1.0
DIGM 100	Digital Design Tools	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
VSST 102	Design II	4.0
Arts and Humanities elective		3.0
	Term Credits	17.0
Term 3		
ARTH 103	History of Art III: Modern Art	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
MATH 101	Introduction to Analysis I	4.0
VSST 103	Design III	4.0
VSST 111	Figure Drawing I	3.0
	Term Credits	17.0
Term 4		
PROD 205	Applied Making I	3.0
PROD 210	Introduction to Product Design	3.0
PROD 235	Applied Design Visualization	3.0
VSCM 240	Typography I	3.0
Arts & Humanities elective		3.0
	Term Credits	15.0
Term 5		
COOP 101	Career Management and Professional Development	0.0
MATE 120	Modern Materials in Your World	3.0
MATE 121	Mechanical Behavior of Materials for Product Design	1.0
MEM 201	Foundations of Computer Aided Design	3.0
PROD 220	Product Design Form Studio	4.0
VSCM 230	Visual Communication I	4.0
	Term Credits	15.0
Term 6		
CHEM 201	Why Things Work: Everyday Chemistry	3.0
DSMR 201	Analysis of Product	3.0
ECON 201	Principles of Microeconomics	4.0
PROD 230	Product Design Process Studio	4.0
Select one of the following:		4.0
VSST 201	Multimedia: Performance	
VSST 202	Multimedia: Space	
VSST 203	Multimedia: Materials	
	Term Credits	18.0
Term 7		
PHTO 110	Photography	3.0
PROD 225	Computer Aided Imagining in Product Design	3.0
PROD 245	Seminar Professional Landscape	3.0
PROD 255	Applied Materials in Product Design	3.0
Free elective		3.0
	Term Credits	15.0
Term 8		

PHYS 170	Electricity and Motion	3.0
PHYS 171	Computational Lab for Electricity and Motion	1.0
PROD 340	Interdisciplinary Product Design Studio	4.0
PSY 101	General Psychology I	3.0
Free elective		3.0
Social science elective		3.0
	Term Credits	17.0
Term 9		
COM 220	Qualitative Research Methods	3.0
PHTO 234	Studio Photography	4.0
PROD 345	Applied Human Centered Design	3.0
PSY 332	Human Factors and Cognitive Engineering	3.0
Free elective		3.0
	Term Credits	16.0
Term 10		
ARTH 300 [WI]	History of Modern Design	3.0
PROD 425	Applied Design Research	3.0
PROD 460	Research Synthesis Studio	4.0
Free electives		6.0
	Term Credits	16.0
Term 11		
MGMT 260	Introduction to Entrepreneurship	4.0
PROD 470	Create Build Studio	4.0
Free electives		6.0
	Term Credits	14.0
Term 12		
PROD 475	Professional Practice in Product Design	3.0
PROD 480	Exhibition Studio	4.0
Free electives		6.0
	Term Credits	13.0

Total Credit: 187.0

Co-op/Career Opportunities

Product designers have careers in a wide range of industries including consumer electronics, housewares, furniture, fashion accessories, medical devices, toys, automotive and transportation. The work of product designers improves the usefulness and appearance of countless products that contribute to the quality of our work and personal lives.

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Product Design Faculty

Ann Gerondelis, AIA, IDSA *(Georgia Institute of Technology) Design Department Head*. Teaching Professor. Embodied perception and its relationship to the design of human experiences, from the scale of the built environment to objects that surround us.

Josh Longo, BA *(Pratt Institute) Fabrication Shop Manager, Department of Design*.

Erik Sundquist, MA *(Florida International University) Hybrid Making Lab Director*. Associate Teaching Professor. Product design

Screenwriting and Playwriting

Major: Screenwriting and Playwriting
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 183.0

Co-op Options: One Co-op (Four years)
Classification of Instructional Programs (CIP) code: 50.0504
Standard Occupational Classification (SOC) code: 27-3043

About the Program

The Westphal College Screenwriting & Playwriting program guides students in their pursuit of a career writing for the stage or screen. The program emphasizes the principles of dramatic writing through a practical hands-on approach to instruction in small classes. Our graduates take away the skills, experience, and confidence to gain an edge in a rewarding and competitive field.

Students first acquire the essential skills of dramatic story telling, then apply those abilities to the creation of scripts that conform to professional standards. Drexel's pioneering co-op affords hands-on experience in the field, working alongside professional artists. Drexel marks the beginning of the life-long process of developing a writer's eye that sees the world from a different angle and allows writers to tell their own uniquely compelling stories.

The Screenwriting & Playwriting Program also offers a Minor in Screenwriting (p. 581).

For more information about this major, visit the College's Screenwriting & Playwriting (http://www.drexel.edu/westphal/academics/undergraduate/SCRP/) page, or contact the Program Director:

Matthew J. Kaufhold (http://drexel.edu/westphal/about/directory/KaufholdMatthew/)
Screenwriting and Playwriting Program
Department of Cinema & Television
Antoinette Westphal College of Media Arts & Design
215-895-2882
kaufhold@drexel.edu

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

General education requirements		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 119	Mathematical Foundations for Design	4.0
UNIV A101	The Drexel Experience	2.0
Required Arts and Humanities (excluding ENGL courses) - students elect a minimum of 9.0 credits		9.0
Required Natural Science-students elect a minimum of 8.0 credits		8.0
Required Social Science-students elective a minimum of 9.0 credits		9.0
Electives		31.0
Visual Studies Requirements		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
VSST 107	Introduction to Design for Media	3.0
Screenwriting and Playwriting Requirements		
Literature requirements		

ENGL 315 [WI]	Shakespeare	3.0
Select one of the following:		3.0
ENGL 200 [WI]	Classical to Medieval Literature	
or ENGL 201	Renaissance to the Enlightenment	
or ENGL 202	Romanticism to Modernism	
Select one of the following:		3.0
ENGL 203 [WI]	Survey of World Literature	
or ENGL 204	Post-Colonial Literature	
Literature (ENGL) electives		6.0
Cinema studies/Theatre studies requirements		
ENGL 216 [WI]	Readings in Drama	3.0
THTR 121 [WI]	Dramatic Analysis	3.0
FMST 105	Film History & Theory I	3.0
FMST 205	Film History & Theory II	3.0
Theatre (THTR) choice elective (any advanced acting, directing or production course)		3.0
Cinema studies (FMST Film Studies or TVST Television Studies) elective		3.0
Methods requirements		
FMTV 110	Basic Cinematography	3.0
FMTV 115	Basic Editing	3.0
FMTV 120	Basic Sound	3.0
FMTV 240	Narrative Film	3.0
THTR 210	Acting: Fundamentals	3.0
THTR 211	Acting: Scene Study	2.0
THTR 240	Theatre Production I	3.0
THTR 320	Play Direction	3.0
or FMTV 270	Basic Directing	
Writing requirements		
SCRP 150	Entertainment Storytelling Fundamentals	3.0
SCRP 220	Playwriting I	3.0
SCRP 225	Playwriting II	3.0
SCRP 230	Page to Stage	3.0
SCRP 270 [WI]	Screenwriting I	3.0
SCRP 275 [WI]	Screenwriting II	3.0
SCRP 280 [WI]	Writing the Short Film	3.0
SCRP 310	Literature for Screenwriters	3.0
SCRP 370	Screenplay Story Development	3.0
SCRP 495	Senior Project in Dramatic Writing I	3.0
SCRP 496	Senior Project in Dramatic Writing II	3.0
SCRP 497	Senior Project in Dramatic Writing III	3.0
WRIT 225 [WI]	Creative Writing	3.0
Writing Choice: select one of the following courses:		3.0
COM 160	Introduction to Journalism	
COM 181	Public Relations Principles and Theory	
WRIT 220 [WI]	Creative Nonfiction Writing	
Select one of the following two-course sequences:		6.0
SCRP 382 & SCRP 383	Playwriting Workshop I and Playwriting Workshop II	
SCRP 380 & SCRP 381	Screenwriting Workshop I and Screenwriting Workshop II	
Total Credits		183.0

CONCENTRATION OPTIONS

Concentration in Writing Comics & Graphic Novels

SCRP 260	Writing Comics	3.0
SCRP 263	Comic Book Editing	3.0
SCRP 266	Graphic Novel Art and Industry	3.0
SCRP 384	Comic/Graphic Novel Writing Workshop I	3.0
SCRP 385	Comic/Graphic Novel Writing Workshop II	3.0

Concentration in Narrative Game Writing

GMAP 260	Overview of Computer Gaming	3.0
SCRP 290	Game: Universe & Story	3.0
SCRP 295	Future of Narrative Games	3.0
SCRP 377	Game Writing Workshop I	3.0
SCRP 378	Game Writing Workshop II	3.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
FMTV 120	Basic Sound	3.0
SCRP 220	Playwriting I	3.0
THTR 121 [WI]	Dramatic Analysis	3.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	13.0
Term 2		
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
FMST 105	Film History & Theory I	3.0
FMTV 115	Basic Editing	3.0
SCRP 270 [WI]	Screenwriting I	3.0
UNIV A101	The Drexel Experience	1.0
Natural science elective		4.0
	Term Credits	17.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
FMTV 110	Basic Cinematography	3.0
MATH 119	Mathematical Foundations for Design	4.0
SCRP 150	Entertainment Storytelling Fundamentals	3.0

VSST 107	Introduction to Design for Media	3.0
	Term Credits	17.0
Term 4		
ENGL 203 [WI] or 204	Survey of World Literature Post-Colonial Literature	3.0
FMST 205	Film History & Theory II	3.0
SCRP 225	Playwriting II	3.0
Literature (ENGL) elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 5		
COOP 101	Career Management and Professional Development	0.0
ENGL 216 [WI]	Readings in Drama	3.0
SCRP 275 [WI]	Screenwriting II	3.0
THTR 210	Acting: Fundamentals	3.0
Elective		3.0
	Term Credits	12.0
Term 6		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ENGL 200 [WI] , 201, or 202 [WI]	Classical to Medieval Literature Renaissance to the Enlightenment Romanticism to Modernism	3.0
SCRP 370	Screenplay Story Development	3.0
THTR 211	Acting: Scene Study	2.0
Natural Science elective		4.0
Elective		3.0
	Term Credits	18.0
Term 7		
SCRP 280 [WI]	Writing the Short Film	3.0
SCRP 310	Literature for Screenwriters	3.0
Film Studies/Television Studies elective*		3.0
Free elective		3.0
	Term Credits	12.0
Term 8		
ENGL 315 [WI]	Shakespeare	3.0
THTR 240	Theatre Production I	3.0
THTR 320 or FMTV 270	Play Direction Basic Directing	3.0
Arts and Humanities elective (excluding ENGL courses)		3.0
SCRP 380 or 382	Screenwriting Workshop I Playwriting Workshop I	3.0
	Term Credits	15.0
Term 9		
SCRP 230	Page to Stage	3.0
SCRP 381 or 383	Screenwriting Workshop II Playwriting Workshop II	3.0
Writing choice		3.0
Arts and Humanities elective (excluding ENGL courses)		3.0
Literature (ENGL) elective		3.0
Social science elective		3.0
	Term Credits	18.0
Term 10		
FMTV 240	Narrative Film	3.0
SCRP 495	Senior Project in Dramatic Writing I	3.0
WRIT 225 [WI]	Creative Writing	3.0
Free elective		3.0
Social science elective		3.0
	Term Credits	15.0
Term 11		
SCRP 496	Senior Project in Dramatic Writing II	3.0
Free elective		3.0
Theatre elective*		3.0

Social science elective		3.0
Arts and Humanities elective		3.0
	Term Credits	15.0
Term 12		
SCRP 497	Senior Project in Dramatic Writing III	3.0
Free electives		13.0
	Term Credits	16.0

Total Credit: 183.0

* See degree requirements.

Writing Comics and Graphic Novels Concentration

Term 1		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
FMTV 120	Basic Sound	3.0
SCRP 220	Playwriting I	3.0
THTR 121 [WI]	Dramatic Analysis	3.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	13.0
Term 2		
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
FMST 105	Film History & Theory I	3.0
FMTV 115	Basic Editing	3.0
SCRP 270 [WI]	Screenwriting I	3.0
UNIV 101	The Drexel Experience	1.0
Natural Science elective		4.0
	Term Credits	17.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
FMTV 110	Basic Cinematography	3.0
MATH 119	Mathematical Foundations for Design	4.0
SCRP 150	Entertainment Storytelling Fundamentals	3.0
VSST 107	Introduction to Design for Media	3.0
	Term Credits	17.0
Term 4		
ENGL 203 [WI] or 204	Survey of World Literature Post-Colonial Literature	3.0
FMST 205	Film History & Theory II	3.0
SCRP 225	Playwriting II	3.0
Literature (ENGL) elective		3.0
Free elective		3.0
	Term Credits	15.0
Term 5		
COOP 101	Career Management and Professional Development	0.0
ENGL 216 [WI]	Readings in Drama	3.0
SCRP 260	Writing Comics	3.0
SCRP 275 [WI]	Screenwriting II	3.0
THTR 210	Acting: Fundamentals	3.0
	Term Credits	12.0
Term 6		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ENGL 200 [WI] , 201, or 202 [WI]	Classical to Medieval Literature Renaissance to the Enlightenment Romanticism to Modernism	3.0
SCRP 263	Comic Book Editing	3.0
SCRP 370	Screenplay Story Development	3.0
THTR 211	Acting: Scene Study	2.0

Natural Science elective		4.0
	Term Credits	18.0
Term 7		
SCRP 280 [WI]	Writing the Short Film	3.0
SCRP 310	Literature for Screenwriters	3.0
FMST or TVST elective		3.0
Free elective		3.0
	Term Credits	12.0
Term 8		
ENGL 315 [WI]	Shakespeare	3.0
SCRP 384	Comic/Graphic Novel Writing Workshop I	3.0
THTR 240	Theatre Production I	3.0
THTR 320	Play Direction	3.0
or FMTV 270	Basic Directing	
Arts and Humanities elective		3.0
	Term Credits	15.0
Term 9		
SCRP 230	Page to Stage	3.0
SCRP 385	Comic/Graphic Novel Writing Workshop II	3.0
Arts and Humanities elective		3.0
Literature (ENGL) elective		3.0
Social Science elective		3.0
Writing choice		3.0
	Term Credits	18.0
Term 10		
FMTV 240	Narrative Film	3.0
SCRP 266	Graphic Novel Art and Industry	3.0
SCRP 495	Senior Project in Dramatic Writing I	3.0
WRIT 225 [WI]	Creative Writing	3.0
Social Science elective		3.0
	Term Credits	15.0
Term 11		
SCRP 496	Senior Project in Dramatic Writing II	3.0
Free elective		3.0
Social Science elective		3.0
THTR elective		3.0
Arts & Humanities Elective		3.0
	Term Credits	15.0
Term 12		
SCRP 497	Senior Project in Dramatic Writing III	3.0
Free electives		13.0
	Term Credits	16.0

Total Credit: 183.0

Writing Narrative Games Concentration

Term 1		**Credits**
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or 111	English Composition I	
FMTV 120	Basic Sound	3.0
SCRP 220	Playwriting I	3.0
THTR 121 [WI]	Dramatic Analysis	3.0
UNIV A101	The Drexel Experience	1.0
	Term Credits	13.0
Term 2		
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or 112	English Composition II	
FMST 105	Film History & Theory I	3.0
FMTV 115	Basic Editing	3.0
SCRP 270 [WI]	Screenwriting I	3.0
UNIV 101	The Drexel Experience	1.0
Natural Science elective		4.0
	Term Credits	17.0
Term 3		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or 113	English Composition III	
FMTV 110	Basic Cinematography	3.0
MATH 119	Mathematical Foundations for Design	4.0
SCRP 150	Entertainment Storytelling Fundamentals	3.0
VSST 107	Introduction to Design for Media	3.0
	Term Credits	17.0
Term 4		
ENGL 203 [WI]	Survey of World Literature	3.0
or 204	Post-Colonial Literature	
FMST 205	Film History & Theory II	3.0
GMAP 260	Overview of Computer Gaming	3.0
SCRP 225	Playwriting II	3.0
English Elective		3.0
	Term Credits	15.0
Term 5		
COOP 101	Career Management and Professional Development	0.0
ENGL 216 [WI]	Readings in Drama	3.0
SCRP 275 [WI]	Screenwriting II	3.0
SCRP 290	Game: Universe & Story	3.0
THTR 210	Acting: Fundamentals	3.0
	Term Credits	12.0
Term 6		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ENGL 200 [WI] ,	Classical to Medieval Literature	3.0
201,	Renaissance to the Enlightenment	
or 202 [WI]	Romanticism to Modernism	
SCRP 295	Future of Narrative Games	3.0
SCRP 370	Screenplay Story Development	3.0
THTR 211	Acting: Scene Study	2.0
Natural Science elective		4.0
	Term Credits	18.0
Term 7		
SCRP 280 [WI]	Writing the Short Film	3.0
SCRP 310	Literature for Screenwriters	3.0
FMST or TVST elective		3.0
Free elective		3.0
	Term Credits	12.0
Term 8		
ENGL 315 [WI]	Shakespeare	3.0
SCRP 377	Game Writing Workshop I	3.0
THTR 240	Theatre Production I	3.0
THTR 320	Play Direction	3.0
or FMTV 270	Basic Directing	
Arts & Humanities elective		3.0
	Term Credits	15.0
Term 9		
SCRP 230	Page to Stage	3.0
SCRP 378	Game Writing Workshop II	3.0
Arts and Humanities elective		3.0
English Elective		3.0
Social Science elective		3.0
Writing elective		3.0
	Term Credits	18.0
Term 10		
FMTV 240	Narrative Film	3.0
SCRP 495	Senior Project in Dramatic Writing I	3.0
WRIT 225 [WI]	Creative Writing	3.0

Arts and Humanities elective		3.0
Social Science elective		3.0
	Term Credits	15.0
Term 11		
SCRP 496	Senior Project in Dramatic Writing II	3.0
Free elective		3.0
Arts and Humanities elective		3.0
Social Science elective		3.0
THTR elective		3.0
	Term Credits	15.0
Term 12		
SCRP 497	Senior Project in Dramatic Writing III	3.0
Free electives		13.0
	Term Credits	16.0

Total Credit: 183.0

Co-op/Career Opportunities

Dramatic writing is writing for production — work intended for performance on the stage or screen. These days, "screen" can mean movie, TV, or computer, and the work can be anything from full stage plays to 15-second commercials to video game scripts. As the entertainment industry changes, so do the outlets for our students and graduates.

Co-op Experiences

By working for film and television production companies, theater organizations, entertainment management companies, magazines, advertising and public relations firms, and other professional writers, Screenwriting & Playwriting students gain valuable insights into how the entertainment industry works. In an industry where the process of building a career often begins with a few key contacts, the co-op program gives Drexel students the chance to begin shaping their own professional networks.

Screenwriting and Playwriting students secured Co-op or post-graduation positions with:

- IM Global
- Disney Video Animation
- Marvel Comics
- Lionsgate Films
- Skyless Games
- Arden Theater Company
- Campbell's Soup
- Marvel Studios
- SyFy Network
- Nickelodeon
- Dynamite Entertainment
- prominent Hollywood talent managers
- The Playwright's Center
- Valiant Entertainment
- Sciencefiction.com
- Major League Baseball Productions
- Panels.net
- Voice of America
- Fantagraphics
- the production office of "Star Trek: Enterprise"

Visit the Drexel Steinbright Career Development Center (http://www.drexel.edu/scdc/) page for more detailed information on co-op and post-graduate opportunities.

Screenwriting and Playwriting Faculty

Bruce Graham, BA *(Indiana University of Pennsylvania)*. Associate Teaching Professor. Playwright.

Matthew Kaufhold, MA *(University of North Carolina) Program Director, Screenwriting and Playwriting*. Associate Teaching Professor. Screenwriter, Producer.

Thomas Quinn, MFA *(Temple University) Program Director, Film & Video*. Assistant Professor. Writer, Director, filmmaker.

Andrew Susskind, BA *(Harvard University) Program Director of TV Production & Media Management*. Associate Teaching Professor. Producing for Television, The Sitcom, Directing Single and Multi-Camera

Emeritus Faculty

Ian Abrams, BA *(Duke University)*. Associate Professor. Screenwriting, movies, film, Hollywood.

Virtual Reality & Immersive Media

Major: Virtual Reality and Immersive Media
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 186.0
Co-op Options: One Co-op (Four years); Three Co-op (Five years)
Classification of Instructional Programs (CIP) code: 09.0702
Standard Occupational Classification (SOC) code: 11-9199

About the Program

The design and production of Virtual Reality (VR), Augmented Reality (AR), 360° Video and other Immersive Media formats requires a unique skill set—creative thinking, understanding of design, aesthetic sensitivity, and storytelling are balanced with technical knowledge in areas such as 3D Computer Graphics, Animation, Visual Effects, interactivity, digital camera and image processing technologies. Additionally, critical thinking, the ability to collaborate effectively and communication skills are also integral to success in this rapidly expanding industry.

Drexel's Bachelor of Science in Virtual Reality & Immersive Media program encompasses foundation courses in the applied and social sciences, the humanities, and a wide range of professional digital media coursework to prepare students for careers in VR/AR and related Immersive Media fields. At the heart of the curriculum are the design and production labs and workshops where students are challenged to apply their knowledge acquired from the above disciplines to consequential design problems.

Admission Requirements

In addition to standard application requirements (http://drexel.edu/admissions/overview/), VRIM requires program director review of an additional, major specific essay question and applicant portfolio.

Degree Requirements

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms

before their co-op begins. As of September 2020, COOP 101 will be one credit.

General Education

CIVC 101	Introduction to Civic Engagement	1.0
COM 230	Techniques of Speaking	3.0
COOP 101	Career Management and Professional Development	0.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
PHYS 170	Electricity and Motion	3.0
PHYS 171	Computational Lab for Electricity and Motion	1.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
UNIV A101	The Drexel Experience	2.0
Required Arts and Humanities-students elect a minimum of 9.0 credits		9.0
Required Social Science-students elect a minimum of 9.0 credits		9.0
Free electives		24.0

Art and Art History Requirements

ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ARTH 103	History of Art III: Modern Art	3.0
ARTH 300 [WI]	History of Modern Design	3.0
VSST 108	Design I for Media	3.0
VSST 109	Design II for Media	3.0
VSST 110	Introductory Drawing	3.0
VSST 111	Figure Drawing I	3.0
VSST 210	Painting Basics	3.0

Media and Computer Science Requirements

CS 171	Computer Programming I	3.0
FMVD 206	Audio Production and Post	3.0

Digital Media Requirements

ANIM 140	Computer Graphics Imagery I	3.0
ANIM 141	Computer Graphics Imagery II	3.0
ANIM 155	Previsualization for Animated Production	3.0
ANIM 211	Animation I	3.0
ANIM 212	Animation II	3.0
ANIM 215	History of Animation	3.0
ANIM 220	Digital Compositing I	3.0
DIGM 105	Overview of Digital Media	3.0
DIGM 350 [WI]	Digital Storytelling	3.0
DIGM 451 [WI]	Explorations in New Media	3.0
DIGM 475 [WI]	Seminar: The Future of Digital Media	3.0
DIGM 490	Digital Media Senior Project [*]	9.0
DIGM 491	Digital Media Senior Project Studio [**]	3.0
GMAP 260	Overview of Computer Gaming	3.0
IDM 100	Introduction to Web Development	3.0

Immersive Media Requirements

VRIM 100	Digital Tools for VR/AR Media	3.0
VRIM 110	Digital Imaging for VR/AR Media	3.0
VRIM 120	VR/AR Production Lab I	3.0
VRIM 220	VR/AR Production Lab II	3.0
VRIM 250	Professional Practices for Immersive Media	3.0
VRIM 310	Immersive Media Workshop I	3.0
VRIM 320	Immersive Media Workshop II	3.0
Immersive Media Electives (Choose 5 of the following classes)		**15.0**
ANIM 145	Realtime Visualization	
ANIM 221	Digital Compositing II	
ANIM 248	Advanced Lighting	
ANIM 388	Spatial Data Capture	
ANIM 410	Advanced Compositing	
ANIM 411	Advanced Animation	
CS 172	Computer Programming II	
CS 265	Advanced Programming Tools and Techniques	
GMAP 345	Game Development Foundations	
GMAP 367	Character Animation for Gaming	
VRIM I199	Independent Study in Immersive Media	
VRIM I299	Independent Study in Immersive Media	
VRIM I399	Independent Study in Immersive Media	
VRIM I499	Independent Study in Immersive Media	
VRIM T180	Special Topics in Immersive Media	
VRIM T280	Special Topics in Immersive Media	
VRIM T380	Special Topics in Immersive Media	
VRIM T480	Special Topics in Immersive Media	
Total Credits		186.0

[*] DIGM 490 is taken 3 times for a total of 9.0 credits.

[**] DIGM 491 is taken 3 times for a total of 3.0 credits.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Students participating in the cooperative education program will be enrolled in the required prep course, COOP 101, generally three terms before their co-op begins. As of September 2020, COOP 101 will be one credit.

Term 1		Credits
DIGM 105	Overview of Digital Media	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
PHYS 170	Electricity and Motion	3.0
PHYS 171	Computational Lab for Electricity and Motion	1.0
UNIV A101	The Drexel Experience	1.0
VRIM 100	Digital Tools for VR/AR Media	3.0
VSST 110	Introductory Drawing	3.0
	Term Credits	17.0

Term 2

ANIM 140	Computer Graphics Imagery I	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
	English Composition II	
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
UNIV A101	The Drexel Experience	1.0
VRIM 110	Digital Imaging for VR/AR Media	3.0
VSST 108	Design I for Media	3.0
	Term Credits	17.0
Term 3		
ANIM 141	Computer Graphics Imagery II	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres	3.0
	English Composition III	
MATH 101	Introduction to Analysis I	4.0
VRIM 120	VR/AR Production Lab I	3.0
VSST 109	Design II for Media	3.0
	Term Credits	17.0
Term 4		
ANIM 155	Previsualization for Animated Production	3.0
ANIM 211	Animation I	3.0
CS 171	Computer Programming I	3.0
GMAP 260	Overview of Computer Gaming	3.0
VSST 210	Painting Basics	3.0
	Term Credits	15.0
Term 5		
ANIM 212	Animation II	3.0
ANIM 215	History of Animation	3.0
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
IDM 100	Introduction to Web Development	3.0
VSST 111	Figure Drawing I	3.0
	Term Credits	15.0
Term 6		
ANIM 220	Digital Compositing I	3.0
ARTH 103	History of Art III: Modern Art	3.0
VRIM 220	VR/AR Production Lab II	3.0
Elective		3.0
Immersive Media Elective		3.0
	Term Credits	15.0
Term 7		
COM 230	Techniques of Speaking	3.0
COOP 101	Career Management and Professional Development	0.0
DIGM 350 [WI]	Digital Storytelling	3.0
FMVD 206	Audio Production and Post	3.0
VRIM 250	Professional Practices for Immersive Media	3.0
Immersive Media Elective		3.0
	Term Credits	15.0
Term 8		
ARTH 300 [WI]	History of Modern Design	3.0
DIGM 451 [WI]	Explorations in New Media	3.0
VRIM 310	Immersive Media Workshop I	3.0
Elective		3.0
Immersive Media Elective		3.0
	Term Credits	15.0
Term 9		
DIGM 475 [WI]	Seminar: The Future of Digital Media	3.0
VRIM 320	Immersive Media Workshop II	3.0
Arts & Humanities Elective		3.0
Immersive Media Elective		3.0
Social Science Elective		3.0
	Term Credits	15.0

Term 10		
DIGM 490	Digital Media Senior Project	3.0
DIGM 491	Digital Media Senior Project Studio	1.0
Arts & Humanities Elective		3.0
Elective		3.0
Immersive Media Elective		3.0
Social Science Elective		3.0
	Term Credits	16.0
Term 11		
DIGM 490	Digital Media Senior Project	3.0
DIGM 491	Digital Media Senior Project Studio	1.0
Elective		6.0
Social Science Elective		3.0
	Term Credits	13.0
Term 12		
DIGM 490	Digital Media Senior Project	3.0
DIGM 491	Digital Media Senior Project Studio	1.0
Arts & Humanities Elective		3.0
Elective		9.0
	Term Credits	16.0

Total Credit: 186.0

Facilities

This major is based in the Westphal College's Digital Media Department, located in the Westphal College's URBN Center.

The central creative space for the department is the Animation Capture & Effects Lab (ACE-Lab), featuring a 1200-sq-ft open studio space dedicated to digital media production. The studio features include a 25-foot-by-17-foot green screen cyclorama, studio lighting and modifiers, HD/2k/4k camera systems, camera dolly, Vicon Vantage motion capture system, stereo-360 "VR Video" capture systems, room-scale VR tracking systems, and a full 360° Immersive Projection Dome among other resources.

Additional spaces surrounding the main studio include screening rooms, classrooms and computer labs featuring advanced graphics work stations, VR labs, research labs, meeting rooms and faculty offices.

MBA Program Faculty

Marco Airaudo, PhD *(University of Pennsylvania Philadelphia)*. Associate Professor. Computational economics, international economics, macroeconomics and monetary economics.

Murugan Anandarajan, PhD *(Drexel University) Interim Associate Dean for Academic Affairs*. Professor. Cyber crime, strategic management of information technology, unstructured data mining, individual internet usage behavior (specifically abuse and addiction), application of artificial intelligence techniques in forensic accounting and ophthalmology.

Trina larsen Andras, PhD *(University of Texas at Austin) Head of the Department of Marketing; Academic Director, Center for Corporate Research Management*. Professor. International marketing, marketing channels management, cross-cultural communication.

Orakwue B. Arinze, PhD *(London School of Economics)*. Professor. Client/Server computing; Enterprise Application Software (EAS)/ Enterprise Resource Planning Software (ERP); knowledge-based and decision support applications in operations management.

Jie Cai, PhD *(University of Iowa) Department of Finance.* Associate Professor. Investment banking, mergers and acquisitions, corporate finance and corporate governance.

Suresh Chandran, PhD *(Vanderbilt University).* Clinical Professor. Corporate entrepreneurship; corporate social responsibility; global management; intellectual property and employee rights; Sustainability; Technological Innovation.

Lauren D'Innocenzo, PhD *(University of Connecticut).* Associate Professor. Team effectiveness, contextual influences, emergent team dynamics, shared leadership, multi-level modeling, and groups/teams.

Qizhi Dai, PhD *(University of Minnesota).* Associate Professor. Business Value of Information Technology, eCommerce, Economics of Information Technology, Information System Management.

Pia DiGirolamo, PhD *(Purdue University).* Assistant Clinical Professor. Macroeconomics, international finance.

Boryana Dimitrova, PhD *(Drexel University).* Assistant Clinical Professor. Global marketing, inter-organizational, marketing channels, retailing and retail management.

Michaela Draganska, PhD *(Kellogg School of Management, Northwestern University) Department of Marketing.* Associate Professor. Advertising strategy, product assortment decisions, new product positioning, distribution channels. Marketing analytics and big data, marketing communications, marketing research, marketing strategy, technology and innovation.

Elea Feit, PhD *(University of Michigan) Department of Marketing.* Assistant Professor. Bayesian hierarchical models, interactive (eCommerce), marketing research, missing data.

Christopher Gaffney, PhD *(Rutgers University, New Brunswick).* Assistant Clinical Professor. Applied Probability, Decision Theory, Risk Analysis

Cuneyt Gozu, PhD *(University of Albany).* Associate Clinical Professor. Attitudes; Groups/Teams; Leadership; Motivation; Power and Influence

Michael Howley, PhD *(Arizona State University).* Clinical Professor. Investments in dissatisfied customers, service recovery, health-care marketing, marketing of service organizations, financial consequences of marketing actions.

Yanliu Huang, PhD *(The Wharton School, University of Pennsylvania).* Associate Professor. Consumer n-store decision making, consumer planning, health marketing, memory and learning.

Daniel Korschun, PhD *(Boston University).* Associate Professor. Brand and corporate reputation management, corporate social responsibility, internal marketing, marketing strategy, relationship marketing.

Rosalie S. Kreider, JD *(Villanova University) Department of Legal Studies.* Clinical Professor. Business law, international business law.

David Kurz, EdD *(University of Pennsylvania).* Associate Clinical Professor. Business Education; Groups/Teams; Leadership; Supply Chain Leadership.

Jeongsik Lee, PhD *(University of California Los Angeles).* Assistant Professor. Economics of Innovation; Social networks; Technology management

Johnny Lee, PhD *(University of Utah).* Associate Clinical Professor. Accounting information systems; e-business; managerial accounting; supply chain management

Benjamin Lev, PhD *(Case Western Reserve University).* Trustee Professor. Inventory Control, Mathematical Programming, Operations Planning and Scheduling.

Merrill W. Liechty, PhD *(Duke University).* Clinical Professor. Bayesian statistics, portfolio selection, higher moment estimation, higher moment estimation, Markov Chain Monte Carlo

Dali Ma, PhD *(University of Chicago).* Associate Professor. Social hierarchy; Social networks; Sociology of entrepreneurship; Sociology of transitional China

Mary Mawritz, PhD *(University of Central Florida).* Associate Professor. Abusive supervision; deviant behavior; leadership.

Bruce D. McCullough, PhD *(University of Texas Austin).* Professor. Applied Econometrics, Data Mining, Econometric Techniques, Reliability of Statistical and Econometric Software.

V. K. Narayanan, PhD *(University of Pittsburgh).* Delloitte Touche Jones Stubbs Professor. Cognition and Strategy; Corporate Entrepreneurship; Organization design

Gordian Ndubizu, PhD *(Temple University).* Professor. Financial accounting.

Edward Nelling, PhD, CFA *(University of Pennsylvania-Wharton) Department Head.* Professor. Investments; corporate finance; real estate finance.

Gregory Nini, PhD *(The Wharton School, University of Pennsylvania).* Assistant Professor. Creditor control rights, corporate governance, and firm value; insurance economics.

Fariborz Y. Partovi, PhD *(The Wharton School, University of Pennsylvania) Department of Decision Sciences.* Professor. Manufacturing Technology Development, Quality Implementation, Quality Management, Service Management, Six-Sigma

Natalie Pedersen, JD *(Harvard University) Department of Legal Studies.* Associate Professor. Employment law; employment discrimination; implicit bias.

Christian Resick, PhD *(Wayne State University).* Associate Professor. Groups/Teams; Leadership; Organizational Culture and Fit; Personality.

Patricia Robak, PhD *(Lehigh University) Department of Finance.* Clinical Professor. Investments, money and banking, international finance.

Konstantinos Serfes, PhD *(University of Illinois at Champaign-Urbana).* Professor. Industrial organization; microeconomics; game theory

Samir Shah, DPS *(Pace University).* Clinical Professor. Drexel University's Provost Fellow India Partnerships

Prashant Srivastava, PhD *(Oklahoma State University).* Associate Clinical Professor. New product development, supply chain management, B2B marketing, sales, strategic alliances, organizational learning, market orientation, healthcare marketing, and database marketing.

Srinivasan Swaminathan, PhD *(University of Texas-Austin)*. Professor. Marketing research and strategy, pricing and promotions, loyalty and satisfaction.

Samuel H. Szewczyk, PhD *(Pennsylvania State University)*. Associate Professor. Corporate governance, mergers and acquisitions, financial engineering, investment banking, financial institutions.

George Tsetsekos, PhD *(The University of Tennessee) Dean Emeritus, LeBow College of Business; Francis Professor of Finance*. Professor. Valuation and corporate restructuring, treasury and risk/hedging operations, investment banking, securitization, emerging capital markets, multinational finance, bank asset-liability management.

Daniel Tzabbar, PhD *(University of Toronto)*. Associate Professor. Accessing and managing knowledge; Alliances; Human capital; Organizational learning and change; Social Capital; Technology Entrepreneurship; Technology Innovation

Chen Wang, PhD *(University of British Columbia)*. Associate Professor. Consumer curiosity, self-regulation and goals, sensory perception.

Joan Weiner, PhD *(The Wharton School, University of Pennsylvania)*. Professor. Business ethics, leadership, communication and decision making; educational innovation; health system management design.

Jonathan C. Ziegert, PhD *(University of Maryland) Management Department*. Associate Professor. Attitudes; Diversity; Groups/Teams; Leadership; Organizational Culture and Fit.

Westphal Studies Program

Major: Westphal Studies
Degree Awarded: Bachelor of Science (BS)
Calendar Type: Quarter
Total Credit Hours: 180.0
Classification of Instructional Programs (CIP) code: 50.0101
Standard Occupational Classification (SOC) code: 27-1019

About the Program

The Westphal Studies program provides an individualized course of study initiated by a student. The student must have completed two terms of the junior year in an Antoinette Westphal College of Media Arts and Design major to be eligible for admission into this major.

A small number of students in the Antoinette Westphal College of Media Arts and Design decide that their goals lie at the periphery of the major or the intersection between several majors and would be served by more latitude than offered in the highly specified courses in their major. For these students, the Westphal Studies program major broadens future career goals and allows exploration combined with a focused exposure to a second field. It acknowledges the specialization that is characteristic of the majors in the College and the expectations of the professional fields for which our students are being prepared. Simultaneously, it recognizes the breadth and rapidly changing nature of many disciplines and permits a student who has acquired a basic working knowledge of a specific aspect of media arts and design to investigate a clearly defined alternative.

Admission to the program is limited to currently matriculated College of Media Arts and Design students who have completed the major-intensive sophomore year and experienced a co-op placement or completed

their junior-year courses. The following items are required as part of the application:

- A student-generated, individualized plan of study, developed with and signed by a member of the Westphal Studies Program Advisors Committee
- A statement in writing of the student's goals in applying to the major and the rationale of how the proposed plan of study addresses those goals
- A definition of appropriate co-operative education placement if the student has not completed a six-month employment in the field of his or her major
- A letter from the student's current program director

Approval by the Westphal Studies Program Advisors Committee is required for admission to the major; it is not automatic upon request. The committee must be convinced by the validity of the applicant's reasons for applying, the proposed study plan, and accompanying documentation. Details about the application procedure may be obtained from the director of Westphal Studies Program.

Recommended Plan of Study

This program requires an individualized plan of study. Students sign off on this agreed-upon plan with the Director of the Westphal Studies program. A student must have completed two terms of junior year in a College of Media Arts and Design major to be eligible for admission into this major.

The student, in consultation with her/his advisor and the director of the program, devises a personalized interdisciplinary study plan. The approved plan of study provides a rationale for the concentration and how the elective credits are to be used. This plan of study must be completed and approved before admission into the major.

Degree Requirements

General Education Requirements

General Education Requirements

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
UNIV A101	The Drexel Experience	2.0
Arts and humanities electives		9.0
Mathematics and natural science electives [**]		12.0
Social science electives		9.0
Co-operative education [***]		0.0
Total Credits		41.0

[*]   Students taking the Architecture Part-Time Evening program do not have this requirement.

[**]   At least one course in mathematics and one course in natural science are required.

[***] Not required if prior major did not require co-operative education experience.

Other Requirements

Requirements	Hours
Unrestricted electives	max of 75.0
Professional requirements*	min of 51.0
Concentration or minor**	min of 24.0

* All professional and visual studies courses required in prior major through winter term of junior year must be successfully completed.

** Up to 9 credits of general education and professional requirements may be included in this minimum.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Digital Media BS/MS

Major: Digital Media
Degrees Awarded: Bachelor of Science (BS) and Master of Science (MS)
Calendar Type: Quarter
Total Credit Hours: 180.0 (BS) and 45.0 (MS)
Co-op Options: Graduate Co-op
Classification of Instructional Programs (CIP) code: 11.0801
Standard Occupational Classification (SOC) code: 15-1134

About the Program

Your undergraduate work gives you the tools to succeed in digital media, and our graduate program will give you the tools to shape it.

As natural extension of our Animation and Visual Effects, Game Design and Production, Interactive Digital Media and Virtual Reality and Immersive Media undergraduate programs, our accelerated Masters of Science (MS) program challenge to push beyond what's known and into what's possible.

You'll combine research with applicable skills in 21st century media applications. Our curriculum offers a mix of academic coursework and project-related activities in advanced digital design, including 3D modeling, animation, interactivity, gaming and digital media history, theory and methods.

Admission Requirements

Review by Digital Media Graduate Admissions committee and Digital Media Program Director approval.

Additional Information

For more information, visit the Digital Media (http://drexel.edu/westphal/academics/graduate/DIGM/) web page.

Degree Requirements

The accelerated program in Digital Media can be combined with any BS program at Drexel. Students who are not undergraduate students in the Department of Digital Media need to complete the following two bootcamp courses in addition to the regular BSMS course requirements.

Bootcamps

DIGM 505	Design and Interactivity Bootcamp	3.0
DIGM 506	Animation and Game Design Bootcamp	3.0
Total Credits		6.0

Required Courses

Digital Media Core

DIGM 501	New Media: History, Theory and Methods	3.0
DIGM 510	Designing for Interactivity	3.0
DIGM 511	Research Methods for Digital Media	3.0
Digital Media Specialization		
Select 18.0 credits from the list below:		18.0
	Game Design and Development	
DIGM 530	Game Design I	
DIGM 531	Game Design II	
GMAP 545	Game Development Foundations	
GMAP 547	Serious Games	
GMAP 548	Experimental Games	
GMAP 560	Game Design from the Player's Perspective	
	Animation and Immersive Media	
ANIM 588	Spatial Data Capture	
DIGM 525	Animation I	
DIGM 526	Animation II	
DIGM 547	Organic Modeling	
DIGM 560	Advanced Concepts and Applications in Interactive 3D Environments	
DIGM 616	Immersive World Building	
	UX Design and Digital Cultural Heritage	
DIGM 508	Digital Cultural Heritage	
DIGM 520	Interactivity I	
DIGM 521	Interactivity II	
	General Digital Media	
DIGM 591	Digital Media Skills Intensive	
DIGM I599	Independent Study in Digital Media	
DIGM I699	Independent Study in Digital Media	
DIGM T580	Special Topics in Digital Media	
DIGM T680	Special Topics in Digital Media	
New Media Project		
DIGM 540	New Media Project *	6.0
Thesis Development		
DIGM 680	Thesis Development	3.0
Directed Studies		**9.0**
Total Credits		45.0

* DIGM 540 is taken 2 times.

Sample Plan of Study

The plan of study shown is a sample plan. It is the responsibility of students to satisfy all prerequisites. Students approved to pursue the BS/MS option must work with their primary academic advisor and the Digital Media program to develop a plan of study that fits their respective degree requirements. The minimum number of credits for graduation is 225 but the total number of credits for the program depends on the undergraduate major. The sample program below requires 231 credits for graduation.

Term 1		Credits
DIGM 105	Overview of Digital Media	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
PHYS 121	Physical Science for Design I	4.0
UNIV A101	The Drexel Experience	1.0
VRIM 100	Digital Tools for VR/AR Media	3.0
VSST 110	Introductory Drawing	3.0
	Term Credits	17.0

Term 2		
ANIM 140	Computer Graphics Imagery I	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
PHYS 122	Physical Science for Design II	4.0
UNIV A101	The Drexel Experience	1.0
VRIM 110	Digital Imaging for VR/AR Media	3.0
VSST 108	Design I for Media	3.0
	Term Credits	17.0

Term 3		
ANIM 141	Computer Graphics Imagery II	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
MATH 101	Introduction to Analysis I	4.0
VRIM 120	VR/AR Production Lab I	3.0
VSST 109	Design II for Media	3.0
	Term Credits	17.0

Term 4		
ANIM 211	Animation I	3.0
CS 171	Computer Programming I	3.0
DIGM 223	Creative Concept Design	3.0
GMAP 260	Overview of Computer Gaming	3.0
VSST 111	Figure Drawing I	3.0
	Term Credits	15.0

Term 5		
ANIM 212	Animation II	3.0
ANIM 215	History of Animation	3.0
ARTH 101	History of Art I: Ancient to Medieval	3.0
IDM 100	Introduction to Web Development	3.0
VSST 210	Painting Basics	3.0
	Term Credits	15.0

Term 6		
ANIM 220	Digital Compositing I	3.0
ARTH 103	History of Art III: Modern Art	3.0
VRIM 220	VR/AR Production Lab II	3.0
Elective		3.0
Immersive Media Elective		3.0
	Term Credits	15.0

Term 7		
COM 230	Techniques of Speaking	3.0
COOP 101	Career Management and Professional Development	0.0
DIGM 350 [WI]	Digital Storytelling	3.0
FMVD 206	Audio Production and Post	3.0
VRIM 250	Professional Practices for Immersive Media	3.0
Immersive Media Elective		3.0
	Term Credits	15.0

Term 8		
ARTH 300 [WI]	History of Modern Design	3.0
DIGM 451 [WI]	Explorations in New Media	3.0
DIGM 501	New Media: History, Theory and Methods	3.0
VRIM 310	Immersive Media Workshop I	3.0
Elective		3.0
Immersive Media Elective		3.0
	Term Credits	18.0

Term 9		
DIGM 475 [WI]	Seminar: The Future of Digital Media	3.0
DIGM 510	Designing for Interactivity	3.0
VRIM 320	Immersive Media Workshop II	3.0
Arts & Humanities Elective		3.0
Immersive Media Elective		3.0
Social Science Elective		3.0
	Term Credits	18.0

Term 10		
DIGM 490	Digital Media Senior Project	3.0
DIGM 491	Digital Media Senior Project Studio	1.0
Arts & Humanities Elective		3.0
Elective		3.0
Immersive Media Elective		3.0
Social Science Elective		3.0
Digital Media Specialization		3.0
	Term Credits	19.0

Term 11		
DIGM 490	Digital Media Senior Project	3.0
DIGM 491	Digital Media Senior Project Studio	1.0
DIGM 511	Research Methods for Digital Media	3.0
DIGM 540	New Media Project	3.0
Electives		6.0
Social Science Elective		3.0
	Term Credits	19.0

Term 12		
DIGM 490	Digital Media Senior Project	3.0
DIGM 491	Digital Media Senior Project Studio	1.0
DIGM 540	New Media Project	3.0
Arts & Humanities Elective		3.0
Electives		9.0
	Term Credits	19.0

Term 13		
DIGM 680	Thesis Development	1.0
Digital Media Specialization		3.0
Directed Elective		5.0
	Term Credits	9.0

Term 14		
DIGM 680	Thesis Development	1.0
Digital Media Specialization		4.0
Directed Elective		4.0
	Term Credits	9.0

Term 15

DIGM 680	Thesis Development	1.0
Digital Media Specialization		8.0
	Term Credits	9.0

Total Credit: 231.0

Digital Media Faculty

Paul Diefenbach, PhD *(University of Pennsylvania)*. Associate Professor. Game development, real-time rendering.

Troy Finamore, MS *(Drexel University) Program Director, Interactive Digital Media*. Associate Teaching Professor. Advertising, design and interactivity.

Aroutis N. Foster, PhD *(Michigan State University)*. Associate Professor. Educational psychology and educational technology, especially the following: Motivation; Technological Pedagogical Content Knowledge (TPACK); Immersive Interactive Digital Environments (simulation, games, virtual realities.

Nick Jushchyshyn, MFA *(Academy of Art University) Program Director, VR & Immersive Media*. Associate Professor. Visual effects, digital media and animation.

Frank J. Lee, PhD *(Carnegie Mellon University)*. Professor. Human-computer interaction; cognitive engineering and science; intelligent software agents for games and education.

Robert Lloyd, MFA *(Temple University) Program Director, Game Design & Production*. Associate Teaching Professor. Game development, themed entertainment and motion simulation.

David Mauriello, BA *(Lafayette College)*. Assistant Professor. 3D modeling and animation.

Glen Muschio, PhD *(Temple University)*. Associate Professor. Digital media, society, communication.

Santiago Ontañón, PhD *(University of Barcelona)*. Assistant Professor. Game AI, computer games, artificial intelligence, machine learning, case-based reasoning

Stefan Rank, PhD *(Vienna University of Technology)*. Associate Professor. Artificial intelligence, game design and human-computer interaction.

Jervis Thompson, BS *(Drexel University)*. Teaching Professor. Digital media, interactive multimedia.

Michael Wagner, PhD *(Vienna University of Technology) Program Director, Digital Media*. Associate Professor. Educational use of digital media and computer games.

Jichen Zhu, PhD *(Georgia Institute of Technology)*. Associate Professor. Developing humanistic and interpretive framework of computational technology, particularly artificial intelligence (AI), and constructing AI-based cultural artifacts; interactive storytelling, games and software studies.

Emeritus Faculty

Theo Artz, BFA *(Tyler School of Art, Temple University)*. Associate Professor. Digital media.

Interior Design BS / Design Research MS

Major: Interior Design / Design Research
Degrees Awarded: Bachelor of Science (BS) and Master of Science (MS)
Calendar Type: Quarter
Total Credit Hours: 180.0 (BS) and 46.0 (MS)
Co-op Options: Graduate Co-op
Classification of Instructional Programs (CIP) code: 50.0408
Standard Occupational Classification (SOC) code: 27-1025

About the Program

This five-year path allows students to graduate with a Bachelor of Science in Interior Design, enhanced by a Master of Science in Design Research. Preparing them for a human-centered technology-driven professional career.

BS Interior Design Program Description:

The undergraduate interior design program explores the behavioral, technological, environmental and aesthetic aspects of interior design within the context of increasingly more complex design projects. Combined with art and art history and general education requirements, a core of interior design courses creates a unique education at the forefront of design. Through academics grounded in problem-solving design studios, cooperative employment, and a dedicated faculty, the Interior Design program prepares students for leadership positions in the industry. The Interior Design program is consistently ranked among the top programs in the country, and in the survey by Design Intelligence of "America's Best Design Schools."

The BS interior design program is CIDA (Council for Interior Design Accreditation) and NASAD (National Association of Schools of Art & Design) accredited.

MS Design Research Program Description:

The Design Research program creates an arena for advanced students to explore and enhance their skills in design research areas that include Technology, Environmental Design and Health, including Community Based Design. Driven by the interdisciplinary nature of design, the program addresses the future in response to the emerging and complex designed environment. Designers operate in a world of increasing intricacy; this degree gives candidates a greater depth of knowledge and experience in topics relevant to present and future challenges in design.

The program focuses on providing a forum for students to pursue paths of inquiry and investigation within Design, Technology, Environmental Design and Health. This flexible program operates with a core curriculum that is built on, and augmented by, a customized set of electives, and the second year thesis sequence.

Admission Requirements

- Must Apply between 90-120 Credits
- 3.0 or better GPS
- 2 recommendations
- 500-word Essay
- Work Sample
- Applicants apply in Spring of their Sophomore year and must be approved by both program directors

Degree Requirements

General education requirements

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
SOC 101	Introduction to Sociology	3.0
UNIV A101	The Drexel Experience	2.0
Required Arts and Humanities-students elect a minimum of 9 credits		9.0
Required Natural Science-students elect a minimum of 3 credits		3.0
Required Social Science-students elect a minimum of 6 credits		6.0
Free electives		**24.0**
Undergraduate electives (18 cr)		
Shared Graduate Electives (6 cr)		

Visual studies requirements

ARTH 101	History of Art I: Ancient to Medieval	3.0
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ARTH 103	History of Art III: Modern Art	3.0
VSST 101	Design I	4.0
VSST 102	Design II	4.0
VSST 103	Design III	4.0
VSST 110	Introductory Drawing	3.0
VSST 201	Multimedia: Performance	4.0
or VSST 202	Multimedia: Space	
VSST 203	Multimedia: Materials	4.0
VSST 301	Painting I	4.0
or VSST 311	Sculpture I	

Interior design requirements

INTR 160	Visualization I: Computer Imaging	3.0
INTR 200	History of Modern Architecture and Interiors	3.0
INTR 211	Textiles for Interiors	3.0
INTR 220	Visualization II: Orthographic	3.0
INTR 225	Environmental Design Theory	3.0
INTR 231	Structure	4.0
INTR 232	Interior Studio I	4.0
INTR 233	Interior Studio II	4.0
INTR 241	Visualization III: Digital	3.0
INTR 245	Visualization IV: 3D Modeling	3.0
INTR 250	Interior Materials	3.0
INTR 300 [WI]	Visual Culture: Interiors	3.0
INTR 305 [WI]	Visual Culture: Furniture	3.0
INTR 331	Residential Design Studio	4.0
INTR 341	Visualization V: Methods	3.0
INTR 350	Interior Detailing	3.0
INTR 351	Interior Lighting	3.0
INTR 430	Commercial Design Studio	4.0
INTR 441	Furniture Design	4.0
INTR 442	Hospitality Design Studio	4.0
INTR 445	Contract Documentation for Interior Design	3.0
INTR 450 [WI]	Professional Practice	3.0
INTR 451	Interior Systems	3.0
INTR 491	Senior Project I	3.0
INTR 492	Senior Project II	3.0
INTR 493	Senior Project III	3.0

Design Research requirements

ARTH 530	History of Modern Design	3.0
DSRE 620	Design Problem Solving	3.0
DSRE 625	Technologies of Making	3.0
DSRE 630	Data Visualization for Design Professionals	3.0
DSRE 635	Translational Design Research	3.0
DSRE 641	Contemporary Design Theory	3.0
DSRE 645	Design Research Thesis Proposal	3.0
DSRE 650	Thesis Research and Practicum	1.0
DSRE 760	Thesis in Design Research II	3.0
DSRE 770	Thesis in Design Research III	3.0
DSRE 750	Thesis in Design Research I	3.0
Graduate Electives		9.0
Total Credits		226.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Term 1		Credits
ARTH 101	History of Art I: Ancient to Medieval	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research / English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV A101	The Drexel Experience	1.0
VSST 101	Design I	4.0
	Term Credits	15.0
Term 2		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
UNIV A101	The Drexel Experience	1.0
VSST 102	Design II	4.0
VSST 110	Introductory Drawing	3.0
Arts & Humanities Elective		3.0
	Term Credits	17.0
Term 3		
ARTH 103	History of Art III: Modern Art	3.0
CIVC 101	Introduction to Civic Engagement	1.0

ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or 113	English Composition III	
INTR 160	Visualization I: Computer Imaging	3.0
INTR 200	History of Modern Architecture and Interiors	3.0
VSST 103	Design III	4.0
	Term Credits	17.0
Term 4		
INTR 220	Visualization II: Orthographic	3.0
INTR 225	Environmental Design Theory	3.0
INTR 231	Structure	4.0
INTR 250	Interior Materials	3.0
Free Elective		3.0
	Term Credits	16.0
Term 5		
COOP 101	Career Management and Professional Development	0.0
INTR 232	Interior Studio I	4.0
INTR 241	Visualization III: Digital	3.0
INTR 300 [WI]	Visual Culture: Interiors	3.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
SOC 101	Introduction to Sociology	3.0
	Term Credits	17.0
Term 6		
INTR 211	Textiles for Interiors	3.0
INTR 233	Interior Studio II	4.0
INTR 245	Visualization IV: 3D Modeling	3.0
Natural science elective		3.0
Free elective		3.0
	Term Credits	16.0
Term 7		
INTR 305 [WI]	Visual Culture: Furniture	3.0
INTR 331	Residential Design Studio	4.0
INTR 341	Visualization V: Methods	3.0
INTR 350	Interior Detailing	3.0
VSST 202	Multimedia: Space	4.0
or 201	Multimedia: Performance	
	Term Credits	17.0
Term 8		
INTR 351	Interior Lighting	3.0
INTR 430	Commercial Design Studio	4.0
INTR 451	Interior Systems	3.0
VSST 203	Multimedia: Materials	4.0
Arts and humanities elective		3.0
	Term Credits	17.0
Term 9		
VSST 301	Painting I	4.0
or 311	Sculpture I	
Arts and humanities elective		3.0
Social science elective		3.0
Free elective		6.0
	Term Credits	16.0
Term 10		
INTR 442	Hospitality Design Studio	4.0
INTR 445	Contract Documentation for Interior Design	3.0
INTR 491	Senior Project I	3.0
DSRE 620	Design Problem Solving	3.0
DSRE 625	Technologies of Making	3.0
	Term Credits	16.0
Term 11		
INTR 441	Furniture Design	4.0
INTR 450 [WI]	Professional Practice	3.0
INTR 492	Senior Project II	3.0

DSRE 630	Data Visualization for Design Professionals	3.0
DSRE 635	Translational Design Research	3.0
	Term Credits	16.0
Term 12		
INTR 493	Senior Project III	3.0
Social Science Elective		3.0
DSRE 641	Contemporary Design Theory	3.0
DSRE 645	Design Research Thesis Proposal	3.0
	Term Credits	12.0
Term 13		
DSRE 650	Thesis Research and Practicum	1.0
DSRE Elective		6.0
	Term Credits	7.0
Term 14		
DSRE 750	Thesis in Design Research I	3.0
ARTH 530	History of Modern Design	3.0
DSRE Elective		3.0
	Term Credits	9.0
Term 15		
DSRE 760	Thesis in Design Research II	3.0
DSRE elective		6.0
	Term Credits	9.0
Term 16		
DSRE 770	Thesis in Design Research III	3.0
DSRE Electives		6.0
	Term Credits	9.0

Total Credit: 226.0

Interior Design BS / Urban Strategy MS

Major: Interior Design / Urban Strategy
Degrees Awarded: Bachelor of Science (BS) and Master of Science (MS)
Calendar Type: Quarter
Total Credit Hours: 180.0 (BS) and 48.0 (MS)
Co-op Options:
Classification of Instructional Programs (CIP) code: 50.0408
Standard Occupational Classification (SOC) code: 27-1025

About the Program

The MS in Urban Strategy program is a cross-disciplinary 2-year, 48.0 credit master's degree designed to prepare students to become 21st century urbanists equipped to collaboratively and creatively solve complex multi-faceted urban challenges on all levels: locally, nationally and globally. The program boasts a cross-disciplinary curriculum focused on strategy, problem solving, and collaboration in the domains of urban planning, design, health, engineering, policy, community and economic development and sociology.

Admission Requirements

Transcripts: Provide official transcripts from all colleges and universities attended

Standardized Test Scores: GRE/MAT test scores are accepted and appreciated, but not required. TOEFL scores are required for international applicants or applicants who earned a degree outside the U.S. (minimum scores: 100/577/233). Scores will be reviewed based on section scores and total scores. IELTS scores may be submitted in lieu of TOEFL scores.

Essay: Please write approximately 500 words explaining your reasons for pursuing a degree from Drexel; your short-term and long-term career plans; and how your background, experience, interest, and/or values, when combined with a Drexel degree, will enable you to pursue these goals successfully.

Résumé: Please submit a resume electronically

Letters of Recommendation: Two letters of recommendation are required. To electronically request recommendations, you must list your recommenders and their contact information on your application. We advise that you follow up with your recommenders to ensure they received your recommendation request — they may need to check their junk mail folder. Additionally, it is your responsibility to confirm that your recommenders will submit letters by your application deadline and follow up with recommenders who have not completed their recommendations.

Academic Experience: You must have a minimum undergraduate GPA of 3.0 in your major.

Degree Requirements

General education requirements

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
or ENGL 111	English Composition I	
ENGL 102	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing	3.0
or ENGL 112	English Composition II	
ENGL 103	Composition and Rhetoric III: Themes and Genres	3.0
or ENGL 113	English Composition III	
MATH 101	Introduction to Analysis I	4.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
SOC 101	Introduction to Sociology	3.0
UNIV A101	The Drexel Experience	2.0
Required Arts and Humanities-students elect a minimum of 9 credits		9.0
Required Natural Science-students elect a minimum of 3 credits		3.0
Required Social Science-students elect a minimum of 6 credits		6.0
Free electives		**24.0**
Undergraduate electives (18 cr)		
Shared Graduate Electives (6 cr)		

Visual studies requirements

ARTH 101	History of Art I: Ancient to Medieval	3.0
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ARTH 103	History of Art III: Modern Art	3.0
VSST 101	Design I	4.0
VSST 102	Design II	4.0
VSST 103	Design III	4.0
VSST 110	Introductory Drawing	3.0
VSST 203	Multimedia: Materials	4.0
VSST 202	Multimedia: Space	4.0
VSST 301	Painting I	4.0
or VSST 311	Sculpture I	

Interior design requirements

INTR 160	Visualization I: Computer Imaging	3.0
INTR 200	History of Modern Architecture and Interiors	3.0
INTR 211	Textiles for Interiors	3.0
INTR 220	Visualization II: Orthographic	3.0
INTR 225	Environmental Design Theory	3.0
INTR 231	Structure	4.0
INTR 232	Interior Studio I	4.0
INTR 233	Interior Studio II	4.0
INTR 241	Visualization III: Digital	3.0
INTR 245	Visualization IV: 3D Modeling	3.0
INTR 250	Interior Materials	3.0
INTR 300 [WI]	Visual Culture: Interiors	3.0
INTR 305 [WI]	Visual Culture: Furniture	3.0
INTR 331	Residential Design Studio	4.0
INTR 341	Visualization V: Methods	3.0
INTR 350	Interior Detailing	3.0
INTR 351	Interior Lighting	3.0
INTR 430	Commercial Design Studio	4.0
INTR 441	Furniture Design	4.0
INTR 442	Hospitality Design Studio	4.0
INTR 445	Contract Documentation for Interior Design	3.0
INTR 450 [WI]	Professional Practice	3.0
INTR 451	Interior Systems	3.0
INTR 491	Senior Project I	3.0
INTR 492	Senior Project II	3.0
INTR 493	Senior Project III	3.0
Urban Strategy requirements		
ECON 616	Public Finance and Cost Benefit Analysis	3.0
URBS 510	History of Urban Space	3.0
URBS 520	What is a City	3.0
URBS 530	Quantitative Methods & Reasoning for Urban Strategists	3.0
URBS 610	Civic Engagement & Participatory Methods	3.0
URBS 620	City of Systems	3.0
URBS 630	Spatial Reasoning for Urbanists, Architects & Designers	3.0
URBS 650	Urbanism, Health & the Built Environment	3.0
URBS 670	Thesis I: Research Inquiry & Design	3.0
URBS 675	Thesis Seminar I	1.5
URBS 680	Thesis II: Fieldwork	3.0
URBS 685	Thesis Seminar II	1.5
URBS 690	Thesis III: Documentation	3.0
Graduate Free Electives		6.0
Total Credits		228.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Sample Plan of Study

Term 1		Credits
ARTH 101	History of Art I: Ancient to Medieval	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV A101	The Drexel Experience	1.0
VSST 101	Design I	4.0
	Term Credits	15.0
Term 2		
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
UNIV A101	The Drexel Experience	1.0
VSST 102	Design II	4.0
VSST 110	Introductory Drawing	3.0
Arts & Humanities Elective		3.0
	Term Credits	17.0
Term 3		
ARTH 103	History of Art III: Modern Art	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
INTR 160	Visualization I: Computer Imaging	3.0
INTR 200	History of Modern Architecture and Interiors	3.0
VSST 103	Design III	4.0
	Term Credits	17.0
Term 4		
INTR 220	Visualization II: Orthographic	3.0
INTR 225	Environmental Design Theory	3.0
INTR 231	Structure	4.0
INTR 250	Interior Materials	3.0
Free Elective		3.0
	Term Credits	16.0
Term 5		
COOP 101	Career Management and Professional Development	0.0
INTR 232	Interior Studio I	4.0
INTR 241	Visualization III: Digital	3.0
INTR 300 [WI]	Visual Culture: Interiors	3.0
PHYS 175	Light and Sound	3.0
PHYS 176	Computational Lab for Light and Sound	1.0
SOC 101	Introduction to Sociology	3.0
	Term Credits	17.0
Term 6		
INTR 211	Textiles for Interiors	3.0
INTR 233	Interior Studio II	4.0
INTR 245	Visualization IV: 3D Modeling	3.0
Natural science elective		3.0
Free elective		6.0
	Term Credits	19.0
Term 7		
INTR 305 [WI]	Visual Culture: Furniture	3.0
INTR 331	Residential Design Studio	4.0
INTR 341	Visualization V: Methods	3.0
INTR 350	Interior Detailing	3.0
VSST 202 or 201	Multimedia: Space Multimedia: Performance	4.0
	Term Credits	17.0
Term 8		
INTR 351	Interior Lighting	3.0

INTR 430	Commercial Design Studio	4.0
INTR 451	Interior Systems	3.0
INTR 441	Furniture Design	4.0
Arts and humanities elective		3.0
	Term Credits	17.0
Term 9		
VSST 203	Multimedia: Materials	4.0
VSST 301 or 311	Painting I Sculpture I	4.0
Arts and humanities elective		3.0
Social science elective		3.0
Free elecive		3.0
	Term Credits	17.0
Term 10		
INTR 442	Hospitality Design Studio	4.0
INTR 491	Senior Project I	3.0
URBS 510	History of Urban Space	3.0
URBS 520	What is a City	3.0
URBS 530	Quantitative Methods & Reasoning for Urban Strategists	3.0
Social Science elective		3.0
	Term Credits	19.0
Term 11		
INTR 445	Contract Documentation for Interior Design	3.0
INTR 450 [WI]	Professional Practice	3.0
INTR 492	Senior Project II	3.0
URBS 610	Civic Engagement & Participatory Methods	3.0
URBS 620	City of Systems	3.0
URBS 630	Spatial Reasoning for Urbanists, Architects & Designers	3.0
	Term Credits	18.0
Term 12		
INTR 493	Senior Project III	3.0
ECON 616	Public Finance and Cost Benefit Analysis	3.0
URBS 650	Urbanism, Health & the Built Environment	3.0
Electives		9.0
	Term Credits	18.0
Term 13		
URBS 670	Thesis I: Research Inquiry & Design	3.0
URBS electives		6.0
	Term Credits	9.0
Term 14		
URBS 675	Thesis Seminar I	1.5
URBS 680	Thesis II: Fieldwork	3.0
URBS elective		3.0
	Term Credits	7.5
Term 15		
URBS 685	Thesis Seminar II	1.5
URBS 690	Thesis III: Documentation	3.0
	Term Credits	4.5

Total Credit: 228.0

Minor in Animation and Visual Effects

About the Minor

The Animation and Visual Effects Minor requires the completion of eight courses (minimum 24.0 credits). The minor provides basic foundation in the technological, story-telling and design skills used by animators and visual effects artists in the highly competitive entertainment and design

worlds, with the opportunity for individualized tailoring according to the student's interests.

Required Courses:

ANIM 100	Foundational Tools for Animation & VFX	3.0
or DIGM 100	Digital Design Tools	
or PHTO 141	Digital Photographic Post Production	
or VSCM 200	Computer Imaging II	
ANIM 110	Digital Imaging for Animation & VFX	3.0
ANIM 140	Computer Graphics Imagery I	3.0
ANIM 211	Animation I	3.0
Select four of the following:		12.0
ANIM 141	Computer Graphics Imagery II	
ANIM 212	Animation II	
ANIM 215	History of Animation	
ANIM 220	Digital Compositing I	
ANIM 221	Digital Compositing II	
ANIM 247	Organic Modeling I	
ANIM 248	Advanced Lighting	
ANIM 314	Character Animation I	
ANIM 315	Character Animation II	
ANIM 388	Spatial Data Capture	
ANIM 410	Advanced Compositing	
ANIM 411	Advanced Animation	
Total Credits		24.0

Minor in Architecture

About the Minor

A minor in architecture gives students majoring in other disciplines an opportunity to explore architecture through a coherent sequence of coursework. The minor in architecture can also be used for preparation towards professional graduate study in this field. Interested students should consult the Architecture Program Director for course selection and scheduling.

The minor requires design studio courses, courses in architectural history, and architectural elective courses. No more than 9.0 credits from a student's major can be used to fulfill the minor requirements.

Required Courses

Required Architectural History		9.0
Choice of Three		
ARCH 141	Architecture and Society I	
ARCH 142	Architecture and Society II	
ARCH 143	Architecture and Society III	
ARCH 144	Architecture and Society IV	
Required Architecture Studios [*]		12.0
ARCH 107	Foundation Design I (Non Design Majors)	
ARCH 108	Foundation Design II	
ARCH 109	Foundation Design III	
ARCH 211	Architectural Representation I	
ARCH 181	Architecture Studio 1A	
OR		
ARCH 181	Architecture Studio 1A	
ARCH 182	Architecture Studio 1B	
ARCH 183	Architecture Studio 1C	
OR		
ARCH 183	Architecture Studio 1C	
ARCH 281	Architecture Studio 2A	
ARCH 282	Architecture Studio 2B	

Elective Architecture Courses [**]		3.0-6.0
Total Credits		24.0-27.0

[*] Non-Design Majors will be required to take the following studios: ARCH 107, ARCH 108, ARCH 109, ARCH 211 & ARCH 181
Students who have successfully completed ARCH 192 or VSST 103 should start the studio sequence with ARCH 181
Students who have successfully completed INTR 233 should start the studio sequence with ARCH 183

[**] Electives can be chosen from the ARCH rubric if the prerequisite is satisfied.

Minor in Art History

About the Minor

The minor in art history provides a broad humanistic background not only for students planning to attend graduate and professional schools in the fields of applied, media and design arts, social and information sciences, education, business and medicine, but also for those entering a more general job market. The minor is designed to be flexible enough to appeal to Antoinette Westphal College of Media Arts and Design majors as well as majors from the other colleges throughout the university.

Required Courses

ARTH 101	History of Art I: Ancient to Medieval	3.0
ARTH 102	History of Art II: Renaissance to Romanticism	3.0
ARTH 103	History of Art III: Modern Art	3.0
Select five of the following: [*]		15.0
Art History		
ARTH 300 [WI]	History of Modern Design	
ARTH 301	Asian Art and Culture	
ARTH 302	Art of India	
ARTH 303	Art of China	
ARTH 304	Art of Japan	
ARTH 310	Early American Art	
ARTH 311	Twentieth Century American Art	
ARTH 312	Nineteenth Century Art	
ARTH 313	20th Century Art	
ARTH 314	Contemporary Art	
ARTH 315	African-American Art	
ARTH 316	African Art	
ARTH 317	Modern Art Theory and Criticism	
ARTH 320	Art in the Age of Technology	
ARTH 325	Ancient Greek and Roman Art	
ARTH 326	Medieval Art	
ARTH 327	Italian Renaissance Art	
ARTH 328	Northern Renaissance	
ARTH 329	Art of the 17th and 18th Centuries	
ARTH 335 [WI]	History of Costume I: Preclassical to Directoire	
ARTH 336 [WI]	History of Costume II: Directoire to World War I	
ARTH 337	History of Costume: Post World War I to Present	
ARTH 340	Women in Art	
ARTH 477	Art History Seminar	
ARTH I399	Independent Study in Art History	
ARTH I499	Independent Study in Art History	
ARTH T380	Special Topics in Art History	
ARTH T480	Special Topics in Art History	
History of Architecture		
ARCH 141	Architecture and Society I	
ARCH 142	Architecture and Society II	
ARCH 143	Architecture and Society III	

ARCH 341 [WI]	Theories of Architecture I	
ARCH 342 [WI]	Theories of Architecture II	
ARCH 343	Theories of Architecture III	
ARCH 344 [WI]	History of Modern Architecture I	
ARCH 345 [WI]	History of Modern Architecture II	
ARCH 346 [WI]	History of Philadelphia Architecture	
ARCH 347 [WI]	Intensive Architectural Studies	
ARCH 348 [WI]	Studies in Vernacular Architecture	
ARCH 421 [WI]	Environmental Psychology and Design Theory	
ARCH 441	Urban Design Seminar	
ARCH T380	Special Topics in Architecture	
ARCH I399	Independent Study in Architecture	
ARCH I499	Independent Study in Architecture	
ARCH T480	Special Topics in Architecture	
History of Film		
FMST 101	Film History I: Emergence	
FMST 102	Film History II: New Waves	
FMST 103	Film History III: Trends	
FMST 150	American Classic Cinema	
FMST 250	The Documentary Tradition	
FMST 255	Hitchcock	
FMST 260	The Western	
FMST T380	Special Topics in Film Studies	
FMST T480	Special Topics in Film Studies	
History of Interior Design		
INTR 200	History of Modern Architecture and Interiors	
INTR 300 [WI]	Visual Culture: Interiors	
INTR 305 [WI]	Visual Culture: Furniture	
History of Graphic Design		
VSCM 350 [WI]	Graphic Design: 20th Century and Beyond	
History of Theatre		
THTR 221 [WI]	Theatre History I	
THTR 222 [WI]	Theatre History II	
History of Photography		
PHTO 275 [WI]	History of Photography I	
PHTO 276 [WI]	History of Photography II	
PHTO 452 [WI]	History of Contemporary Photography	
Total Credits		**24.0**

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Dance

About the Minor

The minor in dance offers students an opportunity to explore dance in the studio through technique classes, and in the classroom through academic classes in dance. Participation in the dance ensemble class(es) is required, although performance with the ensemble is not. There is no audition for the dance minor program.

Required Courses

DANC 104	Ballet Technique I	2.0
DANC 105	Modern Dance Technique I	2.0
DANC 106	Jazz Dance Technique I	2.0
or DANC 107	Hip-Hop Dance Technique I	
DANC 115	Introduction to Dance	3.0
DANC 235	Dance Composition I	3.0
DANC 315	Twentieth Century Dance	3.0
DANC 135	Rhythmic Study for Dance	3.0
THTR 240	Theatre Production I	3.0
Electives in Dance (DANC 104-DANC 495)		3.0
Dance Practicum (6 terms from DANC 131-DANC 133)		0.0
Total Credits		**24.0**

Minor in Digital Media

About the Minor

***Note:* Effective for the Fall 2019-2020 academic year, students are not being accepted into this minor.**

The Digital Media Minor requires the completion of eight courses (minimum 24.0 credits). The minor provides basic foundations in digital media, including; 3D animation, game art, and interactivity with the opportunity for individualized tailoring according to the student's interests.

The Digital Media Minor is open to all University students.

Program Requirements

Required Courses:

DIGM 100	Digital Design Tools	3.0
DIGM 105	Overview of Digital Media	3.0
ANIM 140	Computer Graphics Imagery I	3.0
GMAP 260	Overview of Computer Gaming	3.0
IDM 100	Introduction to Web Development	3.0
Select any three courses in ANIM, DIGM, GMAP or WBDV		9.0
Total Credits		**24.0**

Minor in Entertainment & Arts Management

About the Minor

Drexel's Entertainment & Arts Management (EAM) minor program gives students an introduction to the challenging industry of entertainment and arts business. The selected curriculum gives students a basis in entertainment finance, promotion, business planning, intellectual property rights, cultural literacy, and artist representation. Students in Drexel's EAM minor do not choose concentrations but rather take a core selection of classes and then select nine hours of electives in order to customize their learning.

The EAM minor is open to all undergraduate students in the Drexel University system; no prerequisites are required but departmental approval is needed.

Interested students should contact EAM professor Dr. Brea Heidelberg at bmh29@drexel.edu to schedule a meeting to discuss adding the EAM minor.

EAM 130	Overview of Entertainment and Arts Management	3.0
EAM 211	Strategic Management for Entertainment and Arts Management	3.0
EAM 261	Copyrights and Trademarks	3.0
EAM 340	Artist Representation and Management	3.0
EAM 391 [WI]	Entertainment Promotion and Branding	3.0
Select three courses from the following:		9.0
EAM 200	Introduction to the Music Industry	
EAM 270	Audience Development for Arts	
EAM 301	Gallery and Collection Management	
EAM 302	Exhibition Design	
EAM 310	Social Media in Entertainment	
EAM 312	Introduction to Fund Development for the Arts	
EAM 313	Volunteer and Board Management	
EAM 321	Box Office and Venue Management	
EAM 322	Performing Arts Touring	
EAM 325	Producing for Live Entertainment	
EAM 350	Arts, Culture and Society	
EAM 361	Law for Entertainment and Arts Management Managers	
EAM 365	Media and Entertainment Business	
EAM 401 [WI]	Writing for Arts Managers	
EAM 461	Entertainment Publishing	
EAM 471	Fine Arts Market Development	
EAM 472	Trends in Visual Arts	
EAM T380	Special Topics in Entertainment & Arts Management	
EAM T480	Special Topics in Entertainment & Arts Management	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Film Studies

About the Minor

The Minor in Film Studies comprises courses that cover the major artistic and institutional developments in cinema from its late-nineteenth-century origins to the present. As these courses cover a variety of critical topics that are essential to any film studies curriculum - such as the study of major genres and auteurs, the technologies and techniques contributing to the development of the medium, as well as the historical circumstances that influenced the cinema's evolution since its inception - they will establish a sound critical foundation for students to choose and to flourish in the subsequent courses required for the minor.

The Minor in Film Studies is open to all University students.

Program Requirements

Required Courses:		
FMST 101	Film History I: Emergence	3.0
or FMST 105	Film History & Theory I	
FMST 102	Film History II: New Waves	3.0
or FMST 205	Film History & Theory II	
FMST 250	The Documentary Tradition	3.0
Select five of the following:		15.0
FMST 103	Film History III: Trends	
FMST 255	Hitchcock	
FMST 260	The Western	
FMST 262	Film Comedy	
FMST 266	The Cinematographer's Art	
FMST 270	Controversial Films	
FMST 275	Breakthroughs of Contemporary Film Directors	
FMST 276	Great Years in Cinema: 1999	
FMST 290	Hollywoodland I	
FMST 291	Hollywoodland II	
FMST 340	French New Wave	
FMST 345	Italian Neo Realism	
FMST 352	The Horror Film	
FMST 355	Contemporary Cinema	
FMST T180	Special Topics in Film Studies	
FMST T280	Special Topics in Film Studies	
FMST T380	Special Topics in Film Studies	
FMST T480	Special Topics in Film Studies	
Total Credits		24.0

Minor in Fine Arts

About the Minor

The Fine Arts minor enables students to develop skills and concepts in the studio arts. Students in studio courses learn to combine skills in using

tools and materials, visual theoretical concepts, and new technologies, all of which are necessary for design professionals.

To be eligible for the minor in Fine Arts, a student must have completed a minimum of 30.0 undergraduate credits, have a declared major, and have a minimum GPA of 2.7. The academic credit requirements for the minor must be completed at or before the time of graduation.

Basic design prerequisite courses are required for many programs in Westphal College and some of these may already have been taken for a student's major. However, only 9.0 credits of major-related coursework can be applied to the credits required for the minor in fine arts. Students with design credits from other schools or departments may be allowed to apply them to their prerequisite requirements only upon review by the fine arts minor faculty advisor.

Required Courses

VSST 101	Design I	4.0
or VSST 108	Design I for Media	
VSST 110	Introductory Drawing	3.0
Select a minimum of an additional 17.0 credits from the following:		17.0
PHTO 110	Photography	
PHTO 210	Intermediate Photography	
PHTO 233	Large Format Photography	
PHTO 253	Fine Black & White Printing	
VSST 102	Design II	
VSST 103	Design III	
VSST 111	Figure Drawing I	
VSST 109	Design II for Media	
VSST 112	Figure Drawing II	
VSST 201	Multimedia: Performance	
VSST 202	Multimedia: Space	
VSST 203	Multimedia: Materials	
VSST 301	Painting I	
VSST 302	Painting II	
VSST 303	Painting III	
VSST 304	Materials Exploration	
VSST 310	Sculpture: Metal Fabrication	
VSST 311	Sculpture I	
VSST 312	Sculpture II	
VSST 313	Sculpture III	
VSST 321	Screenprint I	
VSST 322	Printmaking I	
VSST 323	Printmaking II	
VSST 324	Advanced Printmaking	
VSST 325	Screenprint II	
VSST I399	Independent Study in Visual Studies	
VSST T480	Special Topics in Visual Studies	
Total Credits		24.0

Minor in Graphic Design

About the Minor

The Graphic Design minor features individualized investigation of medium, content, context, and technology. It places emphasis on critical thinking, analytical reasoning, written and oral communication skills, integrity, and ethics while instructing technology as a tool.

The minor offers course work with a focus on the connection between graphic design and technology with instruction in Digital Design Tools, Composition, Corporate Identity, Typography, Publication Design, and

Photography. Recommended electives include Computer Imaging 2, Web Graphics, Drawing, and Design History.

The Graphic Design minor is available to all Drexel University students, and requires the completion of seven courses for a minimum of 24.0 credits. For more information contact Program Director Bill Rees (wbr24@drexel.edu).

Program Requirements

Select one VSST course [*]		3.0
VSST 100	Introduction to Art & Design	
VSST 102	Design II	
VSST 107	Introduction to Design for Media	
VSST 109	Design II for Media	
PHTO 110	Photography	3.0
VSCM 230	Visual Communication I	4.0
VSCM 231	Visual Communication II	4.0
VSCM 232	Visual Communication III	4.0
VSCM 240	Typography I	3.0
WEST 100	Introduction to Digital Design Tools	3.0
Recommended Electives: [*]		
VSCM 200	Computer Imaging II	
VSCM 242	Typography II	
VSCM 332	Visual Communication IV	
VSCM 350 [WI]	Graphic Design: 20th Century and Beyond	
WMGD 220	Web Graphics I	
Total Credits		24.0

[*] Westphal students and others who have taken VSST 102, VSST 107 or VSST 109 should complete a recommended elective.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Interactive Digital Media

About the Minor

The Interactive Digital Media Minor requires the completion of eight courses (minimum 24.0 credits). The minor provides basic foundations in user interface design (UI), user experience design (UX), and interaction

design (IXD), including: design and development of websites and mobile applications with the opportunity for individualized tailoring according to the student's interests. It is open to all University students and is administered and advised by the Interactive Digital Media program.

Program Requirements

Required Courses

IDM 100	Introduction to Web Development	3.0
IDM 211	User Interface Design I	3.0
Select six of the following:		18.0
ANIM 115	Introduction to Production with Animation & VFX	
DIGM 100	Digital Design Tools	
DIGM 308 [WI]	Digital Cultural Heritage	
DIGM 451 [WI]	Explorations in New Media	
EAM 315	Content Strategies for Digital Products	
IDM 101	History of Web Development	
IDM 212	User Interface Design II	
IDM 213	Interaction Design	
IDM 215	User Experience Design I	
IDM 216	User Experience Design II	
IDM 221	Web Design I	
IDM 222	Web Design II	
IDM 231	Scripting for Interactive Digital Media I	
IDM 232	Scripting for Interactive Digital Media II	
IDM 240	Interactive Graphics	
IDM 241	Microinteractions	
IDM 245	Web Game Design	
IDM 250	Content Management Systems	
IDM 311	User Interface Design for Immersive Media	
IDM 331	WebVR	
IDM 361	Interactive App Design I	
IDM 362	Interactive App Design II	
IDM 363	Interactive App Design III	
IDM 364	Interactive App Design IV	
IDM 371	Interactive Digital Media Workshop I	
IDM 372	Interactive Digital Media Workshop II	
IDM 381	Experimental Interactive Technologies	
IDM 382	Internet of Things	
IDM 402	Validating Product Ideas	
IDM 417	User Research Methodologies	
IDM 418	Storytelling for User Experience Design	
IDM T380	Special Topics in Interactive Digital Media	
WEST 107	Maker Workshop	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/

academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Jazz and African-American Music

About the Minor

The minor in Jazz and African-American music takes advantage of Drexel faculty expertise in those areas. This minor can include course work in jazz history, African-American music, jazz theory, private study in jazz performance, and ensemble work in several ensembles devoted to jazz.

MUSC 121	Music Theory I	3.0
MUSC 125	Ear Training I	1.0
MUSC 126	Ear Training II	1.0
MUSC 196	Jazz Class Piano	2.0
MUSC 241	Private Lesson (3 terms)	6.0
MUSC 300	Improvisation	3.0
MUSC 331	World Musics	3.0
MUSC 333	Afro-American Music USA	3.0
MUSC 336	History of Jazz	3.0
Ensembles*		
Total Credits		25.0

*   6 terms of MUSC 107 and/or MUSC 108, MUSC 112, MUSC 115

Minor in Music

About the Minor

The minor in music requires 26.0 credits, including work in music theory, history, applied music (class or private lessons), and ensemble performance, and 6.0 credits of music electives.

MUSC 121	Music Theory I	3.0
MUSC 125	Ear Training I	1.0
MUSC 126	Ear Training II	1.0
MUSC 331	World Musics	3.0
MUSC 231	Music History I	3.0
MUSC 232	Music History II	3.0
MUSC 241	Private Lesson (Students take 3 terms)	6.0
Music electives		6.0
Ensembles (Six terms from MUSC 101 to MUSC 118)		0.0
Total Credits		26.0

Minor in Music Performance

About the Minor

The minor in music performance requires two years of private lessons study with our artist faculty, culminating in a recital. The Music Program will provide support for the recital venue and accompanist. Students must audition and be approved to pursue this minor.

Required Courses

MUSC 121	Music Theory I	3.0
MUSC 125	Ear Training I	1.0

MUSC 126	Ear Training II	1.0
MUSC 241	Private Lesson (5 terms)	10.0
MUSC 231	Music History I	3.0
MUSC 232	Music History II	3.0
MUSC 331	World Musics	3.0
MUSC 342	Applied Music-Recital	2.0
Ensembles (six terms from MUSC 101 to MUSC 118))		0.0
Total Credits		26.0

Minor in Music Theory and Composition

About the Minor

The minor in music theory and composition is aimed at people who are writing their own music or who would like to begin doing so. Students will take courses in music theory, arranging, composition, and digital composition, and end with a portfolio of several completed pieces.

Requirements

MUSC 121	Music Theory I	3.0
MUSC 122	Music Theory II	3.0
MUSC 229	Modern Arranging Techniques	3.0
MUSC 125	Ear Training I	1.0
MUSC 249	Digital Music Composition	3.0
MUSC 231	Music History I	3.0
MUSC 232	Music History II	3.0
MUSC 252	Music Composition	3.0
MUSC 331	World Musics	3.0
MUSC 241	Private Lesson (*)	2.0
Ensembles (**)		
Total Credits		27.0

*   Students are strongly encouraged to register for the section designated for composition.

**   Ensembles (6 terms from MUSC 101 to MUSC 118)

Minor in Performing Arts

About the Minor

Designed for the student who wishes to explore the fields of dance, music and theatre rather than specialize in one area, the minor in performing arts provides motivated students the opportunity to learn about all three areas while performing for two years in one or more of the department's performing groups.

Program Requirements

Required Courses

DANC 115	Introduction to Dance	3.0
MUSC 130	Introduction to Music	3.0
Applied music (two terms selected from MUSC 241 / MUSC 242)		4.0
THTR 115	Theatrical Experience	3.0
Theatre Elective		3.0
Dance Elective		3.0
Performing Arts Electives		7.0
Performing Arts Practicum *		0.0
Total Credits		26.0

*   Performing arts practicum (6 terms from MUSC 101 - MUSC 115, THTR 130 , and/or DANC 131 - DANC 133).

Minor in Photography

About the Minor

The minor in photography gives students a thorough understanding of photographic practices using a combination of aesthetics and technology. This flexible minor has been developed to accommodate both Antoinette Westphal College of Media Arts and Design majors as well as majors from any other college. It is an excellent choice for students who are majoring in marketing, communications and journalism. Many employers in these fields are now routinely request that candidates have a good working knowledge of Photoshop and photographic practices.

PHTO 110	Photography	3.0
PHTO 141	Digital Photographic Post Production	3.0
PHTO 210	Intermediate Photography	3.0
PHTO 230	Color Photography for Non-Majors	3.0
PHTO 234	Studio Photography	4.0
PHTO 236	Photojournalism	4.0
PHTO 240	Digital Photography II	4.0
Additional Suggested Electives (Optional)		
PHTO 275 [WI]	History of Photography I	
PHTO 276 [WI]	History of Photography II	
PHTO 451	Photography and Business	
PHTO 452 [WI]	History of Contemporary Photography	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Playwriting

About the Minor

The minor in playwriting is intended to guide students from the acquisition of foundational playwriting skills through the completion of a full-length

stage play. Fifteen of the credits are directly craft-oriented, teaching students what they need to know to translate their ideas into a format suitable for production on the stage; the other nine credits are dedicated to background knowledge intended to inform creative thinking and develop a student's individual voice.

Students pursuing a theater minor should note that common courses in the playwriting minor make this course of study a relatively simple addition to their education.

The playwriting minor is open to all students in the university.

Program Requirements

SCRP 220	Playwriting I	3.0
SCRP 225	Playwriting II	3.0
SCRP 230	Page to Stage	3.0
SCRP 382	Playwriting Workshop I	3.0
SCRP 383	Playwriting Workshop II	3.0
THTR 121 [WI]	Dramatic Analysis	3.0
Choice of 2 classes from:		**6.0**
ENGL 216 [WI]	Readings in Drama	
ENGL 315 [WI]	Shakespeare	
THTR 209	Improvisation for the Theatre	
THTR 210	Acting: Fundamentals	
THTR 212	Sketch Comedy	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Product Design

About the Minor

Students in this minor—through a combination of three studio courses and four applied lecture courses—learn to combine skills in creative problem solving with a visual product design process. Students develop product concepts and collaborate on the development of product ideas, including the creation and integration of new technologies, sustainability, health-care and socially responsible design, all of which are beneficial for design professionals.

The minor is specifically created to offer students a unique multi-disciplinary studio experience. Students will develop skills in the rapid visualization of ideas, creative problem solving, transformative design thinking and an understanding of the product development process in a collaborative setting. This minor is offered to all students having an interest in developing product ideas, including students from the College of Engineering, the LeBow College of Business, and the School of Biomedical Engineering as well as College of Media Arts and Design students who would like to add a product focus to their design degree.

Academic requirements

To be eligible for the minor in product design, a student must have completed a minimum of 30.0 undergraduate credits, have declared a major, and have a minimum GPA of 2.7. No prerequisite courses are required. Students may be encouraged to augment or prepare for this minor. Only upon review by the faculty advisor for the minor will students with design credits from other institutions or departments be allowed to apply these to the requirements.

Program Requirements

Required courses		
PROD 101	History and Analysis of Product Design	3.0
PROD 205	Applied Making I	3.0
PROD 210	Introduction to Product Design	3.0
PROD 215	Design Thinking in Product Design	4.0
PROD 230	Product Design Process Studio	4.0
PROD 235	Applied Design Visualization	3.0
PROD 340	Interdisciplinary Product Design Studio	4.0
Total Credits		24.0

Minor in Retail

About the Minor

The retail minor, administered by the Design & Merchandising Program, provides basic foundations in retail operations, buying and merchandise planning and e-commerce. The curriculum allows the opportunity for individualized tailoring according to a student's interests. The minor is open to all Drexel University students, and requires the completion of eight or nine courses for a minimum of 24.0 credits.

Required Courses:		
DSMR 231	Retail Operations [*]	3.0
DSMR 232	Merchandise Planning and Buying [*]	4.0
DSMR 233 [WI]	Retail Image Analysis	3.0
DSMR 324	Retail Intersections: Social & Cultural Issues	3.0
DSMR 325	Advanced Merchandise Planning and Buying	4.0
Select 2-3 courses:		7.0
DSMR 205	Digital Promotion Strategies	
DSMR I299	Independent Study in Design & Merchandising	
DSMR 305	Digital Commerce	
DSMR 313	International Fashion Merchandising	
DSMR 326	Fashion Product Promotion	
DSMR 397	Retail Practicum	
Total Credits		24.0

*   All courses are currently open to all DSMR students.DSMR 231 and DSMR 232 are required for all students enrolled in DSMR and the retail minor. The three elective courses can be delivered during other quarters as required. All courses will be restricted to appropriately include the students enrolled in the retail minor. As the industry and curriculum change, courses will be added and adapted accordingly.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Screenwriting

About the Minor

The minor in screenwriting is intended to guide students from the acquisition of foundational screenwriting skills through the completion of a full-length script for film or television. Fifteen of the credits are directly craft-oriented, teaching students what they need to know to translate their ideas into a format suitable for production; the other nine credits are dedicated to background knowledge intended to inform creative thinking and develop a student's individual voice.

Film & video majors should note that they will be taking half of the courses in the screenwriting minor as part of their degree requirements, making this minor a relatively simple addition to their education.

Required courses

FMST 105	Film History & Theory I	3.0
FMST 205	Film History & Theory II	3.0
SCRP 270 [WI]	Screenwriting I	3.0
SCRP 275 [WI]	Screenwriting II	3.0
SCRP 310	Literature for Screenwriters	3.0
SCRP 370	Screenplay Story Development	3.0
SCRP 380	Screenwriting Workshop I	3.0
SCRP 381	Screenwriting Workshop II	3.0
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Somatics

About the Minor

An understanding of movement and body language has become increasingly important across many fields; in communication, corporate training, movement therapy, education, performance, rehabilitation, sport and fitness. Physical health, clear communication and effective leadership all rely on an awareness of how we carry our bodies through our lives. The Somatics Minor provides an in-depth study of the body, building from an understanding of its functional/structural basis, to its patterns and habits. We focus on how to interpret, analyze, and articulate somatic concepts and develop strategies for application.

Admission requirements

Admission on consultation with Somatics Coordinator:

Jennifer Morley
jsm76@drexel.edu
215.895.2018

Program Requirements

Minor Requirements

DANC 102	Yoga	3.0
DANC 108	Dance Improvisation I	2.0
DANC 116	Dance and Fitness	3.0
DANC 117	Foundations of Somatic Theory and Practice	3.0
DANC 216	Introduction to Laban Movement Analysis	3.0
DANC 316	Dance Kinesiology	3.0
DANC 416	Survey of Somatic Practices	3.0
Complete two of the following courses:		4.0-5.0
DANC 104	Ballet Technique I	
DANC 204	Ballet Technique II	
DANC 304	Ballet Dance Technique III	
DANC 105	Modern Dance Technique I	
DANC 205	Modern Dance Technique II	
DANC 305	Modern Dance Technique III	
DANC 106	Jazz Dance Technique I	
DANC 206	Jazz Dance Technique II	
DANC 306	Jazz Dance Technique III	
DANC 107	Hip-Hop Dance Technique I	
DANC 207	Hip-Hop Dance Technique II	
DANC 208	Dance Improvisation II	

DANC 109	African Dance Technique I	
DANC 209	African Dance Technique II	
Total Credits		24.0-25.0

Minor in Sports Media Production

About the Minor

The Sports Media Production Minor is a gateway for students committed to pursuing a career and a meaningful introduction for those who are intrigued but uncertain about sports media as a profession. Students are required to take the same foundational shooting & lighting, editing, sound, and studio operations courses as the Film & Television majors and minors. They are also required to take a TVIE sports media strategy course as well as SMT digital and sports media history courses that will provide a greater academic and contextual understanding of the profession. With additional courses in actual physical production, on-air performance, and technology courses.

Program Requirements

FMVD 110	Basic Shooting and Lighting	3.0
or FMTV 110	Basic Cinematography	
FMVD 115	Basic Editing	3.0
or FMTV 115	Basic Editing	
FMVD 120	Basic Sound	3.0
or FMTV 120	Basic Sound	
SMT 110	The Business of Sport	4.0
SMT 290	Digital Media in Sport	4.0
TVIE 250	TV Sports Program Strategies	3.0
TVPR 100	TV Studio: Basic Operations	3.0
or FMTV 130	Basic TV Studio	
TVPR 356	DNews	3.0
or FMTV 355	DNews	
Choose one of the following		3.0
TVPR 200	TV Studio: Live Directing	
or FMTV 23	Intermediate TV Studio	
TVPR 242	TV On-Camera Performance	
TVPR T280	Special Topics in TV Production	
TVPR T380	Special Topics in TV Production	
TVPR T480	Special Topics in TV Production	
SMT T280	Special topics in SMT	
SMT T380	Special topics in SMT	
SMT T480	Special topics in SMT	
Total Credits		29.0

Minor in Sustainability in the Built Environment

About the Minor

The intent of this minor is to prepare students to engage and analyze future design challenges from a sustainability perspective. Students completing this program will be able to approach these challenges in a resourceful and insightful way, with a solid foundation of sustainability principles. The emphasis on collaboration and trans-disciplinary teamwork will allow students to serve as agile leaders in their future careers and be active participants in the critical discourse of their field.

In addition to the 15.0 credits of core courses, students select 9.0 credits of electives. The list below will be updated as new courses in sustainability become available. Students having a question about the inclusion of a course not currently listed as a possible elective should check with the coordinator for this minor.

Additional Information

For additional information about this program, contact the program's advisor:

Diana Nicholas
URBN Center, Suite 410
Phone: 215.571.4432
dsn35@drexel.edu

Required Courses		
ARCH 315	Sustainable Built Environment I	3.0
ARCH 320	Sustainable Built Environment II	3.0
INTR 310	Sustainability: History, Theory and Critic	3.0
INTR 410	Collaborative Research in Sustainability	3.0
Arts and Sciences Course		**3.0**
Students must select one of the following courses from the Arts and Science College or an approved substitute with the permission of the advisor for this minor:		
ANTH 360	Culture and the Environment	
ENVS 260	Environmental Science and Society	
PHIL 341	Environmental Philosophy	
SOC 244	Sociology of the Environment	
Additional Electives [*]		**9.0**
Students select three of the following (or alternative options with the permission of the advisor for this minor):		
ANTH 360	Culture and the Environment	
ARCH 348 [WI]	Studies in Vernacular Architecture	
ARCH 463	Emerging Architectural Technology	
ARCH 465	Energy and Architecture	
COM 317 [WI]	Environmental Communication	
ENVS 260	Environmental Science and Society	
INTR T180	Special Topics in Interior Design	
INTR T280	Special Topics in Interior Design	
INTR T380	Special Topics in Interior Design	
INTR T480	Special Topics in Interior Design	
PHIL 341	Environmental Philosophy	
SOC 341	Environmental Movements in America	
Total Credits		24.0

[*] The elective list will be updated as new courses in sustainability become available. If a student has questions regarding inclusion of a course not on this list, he or she should see the Advisor for the Sustainability in the Built Environment Minor Program.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-

courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Television Industry and Enterprise

About the Minor

Students with a 3.0 or higher G.P.A. may apply for the TV Industry & Enterprise minor program. Once accepted, they take 21.0 credits of required courses that provide a basic foundation in the historical, financial, and programming elements of the television industry. The remaining 6.0 credits of study provide students the opportunity to have more hands-on production experience and/or to delve more deeply into the academic study of a specific area of interest.

Program Requirements

Required Courses

TVIE 180	TV Industry Overview	3.0
or FMTV 185	TV Industry	
TVIE 280	Research, Sales and Programming	3.0
TVIE 285	Media Law and Ethics	3.0
or FMTV 285	Media Law and Ethics	
TVIE 290	Introduction to Money and the Media	3.0
TVST 260	History of Television	3.0
TVST 261	History of TV Journalism	3.0
or TVST 361	Art of TV Comedy	
or TVST 362	Art of TV Drama	
Three of the following courses:		9.0
EAM 211	Strategic Management for Entertainment and Arts Management	
EAM 365	Media and Entertainment Business	
EAM 391 [WI]	Entertainment Promotion and Branding	
FMVD 110	Basic Shooting and Lighting	
or FMTV 11	Basic Cinematography	
FMVD 115	Basic Editing	
or FMTV 115	Basic Editing	
FMVD 120	Basic Sound	
or FMTV 12	Basic Sound	
SCRP 270 [WI]	Screenwriting I	
TVPR 100	TV Studio: Basic Operations	
or FMTV 13	Basic TV Studio	
TVIE T180	Special Topics in TV Industry & Enterprise	
TVIE T280	Special Topics in TV Industry & Enterprise	
TVIE T380	Special Topics in TV Industry & Enterprise	
TVIE T480	Special Topics in TV Industry & Enterprise	
TVPR 200	TV Studio: Live Directing	
or FMTV 230	Intermediate TV Studio	
TVPR 201	TV Studio: Comedy	
TVPR 202	TV Studio: Drama	
TVPR 205	TV Studio: Advanced Live Directing	
TVPR 240	Producing for Television	
Total Credits		27.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in TV Production & Media Management

About the Minor

Students with a 3.0 or higher G.P.A. may apply for the TV Production & Media Management minor program. Once accepted, they take 21.0 credits of required courses that provide a basic foundation in the technical, historical, and creative elements of television production. The remaining 6.0 credits of study provide students the opportunity to have more hands-on production experience and/or to delve more deeply into the academic study of a specific area of interest.

Program Requirements

Required Courses

FMVD 110	Basic Shooting and Lighting	3.0
or FMTV 110	Basic Cinematography	
FMVD 115	Basic Editing	3.0
or FMTV 115	Basic Editing	
FMVD 120	Basic Sound	3.0
or FMTV 120	Basic Sound	
SCRP 270 [WI]	Screenwriting I	3.0
TVPR 100	TV Studio: Basic Operations	3.0
or FMTV 130	Basic TV Studio	
TVPR 212	TV Commercials and Promos	3.0
or FMTV 265	Commercials and Promos	
TVST 260	History of Television	3.0
or TVST 105	TV History	
Two of the following courses:		**6.0**
SCRP 241	Writing TV Comedy	
SCRP 242	Writing TV Drama	
TVPR 200	TV Studio: Live Directing	
or FMTV 23	Intermediate TV Studio	
TVPR 201	TV Studio: Comedy	
TVPR 202	TV Studio: Drama	
TVPR 205	TV Studio: Advanced Live Directing	
TVPR 220	TV News Writing	

TVPR 221	TV News Production	
TVPR 230	Scripted TV Production	
TVPR 236	Reality TV Production	
TVPR 240	Producing for Television	
TVPR 242	TV On-Camera Performance	
TVPR T380	Special Topics in TV Production	
TVPR T480	Special Topics in TV Production	
TVST 361	Art of TV Comedy	
TVST 362	Art of TV Drama	
TVST T380	Special Topics in TV Studies	
TVST T480	Special Topics in TV Studies	
Total Credits		27.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Theatre

About the Minor

The minor in theatre consists of two distinct, yet closely integrated components: academics and performance. The intertwining of foundation studies and practical application empowers students to discover and develop their own voice and style in their art.

Program Requirements

Required Course

THTR 121 [WI]	Dramatic Analysis	3.0
Theatre History Requirement		
Select 6.0 credits from any combination of approved 3.0 credit Theatre courses listed below with Historical Perspectives (these include 3.0 credit special topics courses with a historical theater perspective as well)		6.0
THTR 221 [WI]	Theatre History I	
THTR 222 [WI]	Theatre History II	
THTR 231	Introduction to Musical Theatre	
THTR 232	Contemporary Musical Theatre	
Select 3.0 credits total from any combination of the following 1.0 credit courses:		3.0
THTR 130	Introduction to Theater Production Practicum	
THTR 131	Theatre Performance Practicum	
THTR 132	Theatre Production Practicum	
THTR 133	Theatre Management Practicum	
THTR 134	Open Mic Management Practicum	

THTR 141	Theatre Performance Ensemble	
THTR 142	Director's Lab Practicum	
THTR 143	Musical Theatre Cabaret	
THTR 144	NewWorks Festival Performance Practicum	
Select 12.0 credits from the following:		12.0
THTR 110	Voice and Articulation	
THTR 115	Theatrical Experience	
THTR 116	Philadelphia Theatre Let's Go!	
THTR 131	Theatre Performance Practicum	
THTR 132	Theatre Production Practicum	
THTR 209	Improvisation for the Theatre	
THTR 210	Acting: Fundamentals	
THTR 211	Acting: Scene Study	
THTR 212	Sketch Comedy	
THTR 231	Introduction to Musical Theatre	
THTR 232	Contemporary Musical Theatre	
THTR 240	Theatre Production I	
THTR 241	Theatre Production II	
THTR 260	Production Design	
THTR 320	Play Direction	
THTR 360	Lighting Design	
THTR I199	Independent Study in THTR	
THTR I299	Independent Study in THTR	
THTR I399	Independent Study in THTR	
THTR I499	Independent Study in THTR	
THTR T180	Special Topics in Theatre	
THTR T280	Special Topics in Theatre	
THTR T380	Special Topics in Theatre	
THTR T480	Special Topics in Theatre	
Total Credits		24.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Video Production

About the Minor

The Minor in Video Production provides a thorough foundation in film-making craft. Once core required courses are completed, students have the opportunity to apply newly acquired skills in their choice of

several advanced film production courses or to explore television studio production.

The Minor in Video Production is open to all University students.

Required Courses

FMVD 110	Basic Shooting and Lighting	3.0
or FMTV 110	Basic Cinematography	
FMVD 115	Basic Editing	3.0
or FMTV 115	Basic Editing	
FMVD 120	Basic Sound	3.0
or FMTV 120	Basic Sound	
SCRP 270 [WI]	Screenwriting I	3.0
Four of the following courses:		**12.0**
FMVD 210	Documentary Video Production	
or FMTV 250	Documentary Film	
FMVD 215	Narrative Video Production	
or FMTV 240	Narrative Film	
FMVD 220	Experimental Video Production	
or FMTV 260	Experimental Film	
FMVD 235	Intermediate Lighting	
or FMTV 210	Intermediate Lighting	
FMVD 305	Special Effects Make-up	
FMVD T180	Special Topics in Game Film & Video	
or FMTV T180	Special Topics in Film & TV	
FMVD T280	Special Topics in Game Film & Video	
or FMTV T280	Special Topics in Film & TV	
FMVD T380	Special Topics in Game Film & Video	
or FMTV T380	Special Topics in Film & TV	
FMVD T480	Special Topics in Game Film & Video	
or FMTV T480	Special Topics in Film & TV	
SCRP 280 [WI]	Writing the Short Film	
TVPR 100	TV Studio: Basic Operations	
or FMTV 130	Basic TV Studio	
TVPR 200	TV Studio: Live Directing	
or FMTV 230	Intermediate TV Studio	
Total Credits		**24.0**

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Minor in Virtual Reality & Immersive Media

About the Minor

The design and production of Virtual Reality (VR), Augmented Reality (AR), 360° Video and other Immersive Media formats requires a unique skill set—creative thinking, understanding of design, aesthetic sensitivity, and story telling are balanced with technical knowledge in areas such as 3D Computer Graphics, Animation, Visual Effects, interactivity, digital camera and image processing technologies. Additionally, critical thinking, the ability to collaborate effectively and communication skills are also integral to success in this rapidly expanding industry.

Drexel's Minor in Virtual Reality & Immersive Media provides a foundation in the principles, techniques and tools used in the design and production of virtual reality, augmented reality (VR/AR) and other forms of Immersive Media, with the opportunity for individualized tailoring according to the student's interests.

Admission Requirements

Open to students with a 3.0 GPA.

Program Requirements

ANIM 100	Foundational Tools for Animation & VFX	3.0
ANIM 110	Digital Imaging for Animation & VFX	3.0
ANIM 140	Computer Graphics Imagery I	3.0
VRIM 100	Digital Tools for VR/AR Media	3.0
VRIM 110	Digital Imaging for VR/AR Media	3.0
VRIM 120	VR/AR Production Lab I	3.0
Select two of the following:		6.0
ANIM 141	Computer Graphics Imagery II	
ANIM 211	Animation I	
ANIM 220	Digital Compositing I	
ANIM 221	Digital Compositing II	
ANIM 388	Spatial Data Capture	
GMAP 345	Game Development Foundations	
GMAP 367	Character Animation for Gaming	
Total Credits		**24.0**

Dance Studies

Professional Dance Certificate Program

Certificate Level: Undergraduate
Admission Requirements: High school diploma or GED equivalency
Certificate Type: Certificate
Number of Credits of Completion: 18.0
Instructional Delivery: Campus
Calendar Type: Quarter
Maximum Time Frame: 1 year
Financial Aid Eligibility: Not aid eligible
Classification of Instructional Program (CIP) Code: 50.0301
Standard Occupational Classification (SOC) Code: 27-2031

About the Program

The certificate in dance studies is a 1-year option for any qualified professional dancer to assess whether they have the interest and aptitude for entering an undergraduate dance program. The certificate program has no entrance requirement beyond possession of a high school diploma

or GED equivalency. All credits earned in the certificate of study in dance will be transferable into the part-time or full time BS degree in Dance (p. 509).

Program Requirements

General Requirements

DANC 101	Introduction to Dance Studies	3.0
DANC 115	Introduction to Dance	3.0
DANC 116	Dance and Fitness	3.0
DANC 135	Rhythmic Study for Dance	3.0
DANC 215	Dance Appreciation	3.0
DANC 216	Introduction to Laban Movement Analysis	3.0
Total Credits		18.0

Additional Academic Programs

Emerging Scholars Program

About the Program

This program is designed for students interested in the humanities and social sciences and who want to experience the range of opportunities in these disciplines. In particular, the program is designed for students with academically strong backgrounds who are civic-minded and enthusiastic, who want to make an impact—in other words: emerging scholars.

The Program will provide mentorship, specialized seminars, and co-curricular events to guide students towards defining their scholarly and career interests. The Emerging Scholars Program does not grant a degree, but helps guide students in choosing a major that's right for them. The program has been created so that students will be able to move easily into the curricula for any of the humanities and social science majors by sophomore year (or earlier if so requested).

Additional Information

More information about the Emerging Scholars Program (http://drexel.edu/coas/academics/undergraduate-programs/emerging-scholars-program/) can be found on the College of Arts and Sciences website.

First Year Exploratory Studies

About the Program

The First-Year Exploratory Studies program allows students to explore their academic options before declaring a major and stay on track with credits during their first year. With the help of an advisor, students can select courses based on their unique interests and goals.

To focus the journey, there are two tracks available: Business, Humanities, and Social Science Track and the Science, Technology, Engineering, and Mathematics Track. By the end of the first year, students select a major of choice and are guided toward a future career path.

The First-Year Exploratory Studies program empowers students to make well-informed decisions around choosing a degree program, getting involved on campus, and following their ambitions.

More information about the First-Year Exploratory Studies program can be found on the Goodwin College of Professional Studies website (http://www.drexel.edu/goodwin/academics/first-year-exploratory-studies-program/).

Business, Social Science, and Humanities Track (Non-STEM)

Plan of Study

First Year

Fall		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
UNIV G101	The Drexel Experience	1.0
Exploratory Track Electives		8.0
Mathematics Course		3.0-4.0
	Term Credits	15.0-16.0
Winter		
CIVC 101[*]	Introduction to Civic Engagement	1.0
ENGL 102 or 112[*]	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
FYE 102	Academic Exploration and Planning	3.0
Exploratory Studies Track Electives		6.0-8.0
Mathematics Course		4.0
	Term Credits	17.0-19.0
Spring		
COOP 101	Career Management and Professional Development	0.0
ENGL 103 or 113[*]	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
FYE 103	Career Exploration and Planning	3.0
Exploratory Track Electives		10.0-12.0
	Term Credits	16.0-18.0

Total Credit: 48.0-53.0

[*]   Can be deferred to explore additional exploratory track electives.

[**]   May be taken in winter term if tracking toward a Computer Science major.

Science, Technology, Engineering, and Mathematics (STEM)

Plan of Study

First Year

Fall		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research English Composition I	3.0
UNIV G101	The Drexel Experience	1.0
Exploratory Track Electives		5.5-6.0
Mathematics Course		3.0-6.0
Science Course		3.5-4.5
	Term Credits	16.0-20.5
Winter		
CIVC 101[*]	Introduction to Civic Engagement	1.0
ENGL 102 or 112[*]	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
FYE 102	Academic Exploration and Planning	3.0
Exploratory Track Electives		3.0-6.0
Mathematics Course		3.0-4.0
Science Course		4.0-4.5
	Term Credits	17.0-21.5
Spring		
COOP 101[**]	Career Management and Professional Development	0.0
ENGL 103 or 113[*]	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
FYE 103	Career Exploration and Planning	3.0
Exploratory Track Electives		4.5-5.0
Mathematics Course		3.0-4.0
Science Course		3.0-4.5
	Term Credits	16.5-19.5

Total Credit: 49.5-61.5

Army Reserve Officers' Training Corps (ROTC)

About the Program

The Army Reserve Officers' Training Corps, established at Drexel in 1918, is an integral part of the University. Army ROTC courses are open to all students, and enrollment alone does not carry a military obligation. Students selected for the advanced course (normally pre-junior, junior, and senior years) will complete their academic and military studies concurrently, and upon graduation will be commissioned as lieutenants in the United States Army, Army Reserve, or Army National Guard. Participation in the advanced course may qualify participants to receive financial aid through a series of scholarships and co-operative education programs.

The purpose of the Army Reserve Officers' Training Corps (https://www.taskforcedragonarmyrotc.com/) program at Drexel University is to provide this nation with leaders of character for our Army, Army Reserve, and National Guard. ROTC training is also intended to foster ideals of patriotism; promote an understanding of the role of the citizen-soldier; stimulate interest in a military career; and develop character, self-discipline, and leadership ability. Army ROTC is a college elective, and enrollment does not require military service.

Students can apply for on-campus 4-year, 3-year and 2-year scholarships at Drexel. All Army ROTC scholarships at Drexel cover full tuition and fees. Additionally, Army ROTC scholarship winners also receive free room (in dorm of choice on campus) and a 25% discount on Drexel's meal plan. These additional incentives are given by the university and total in excess of $7,500 annually. For example, a 3-year Army ROTC scholarship at Drexel, including these incentives plus a monthly stipend and a quarterly textbook stipend is worth over $135,000 over 4-years. In order to be offered a scholarship, students must meet certain physical fitness and academic requirements.

The Military Science program is divided into the basic course and the advanced course. The basic course normally coincides with the student's first two years of college. The purpose of the basic course is threefold: to give the student sufficient information to decide whether to continue in the advanced course, to develop certain military skills, and to allow the instructors an opportunity to evaluate the student's potential to become an officer. In total, the basic course consists of four or five Military Science courses and weekly attendance at Leadership Laboratories each term the cadet is in school. Except for scholarship Cadets, no military obligation is incurred by students participating in these courses. Basic course credit may be granted to students who successfully complete a five-week Cadet Initial Entry Training course at Fort Knox, Kentucky, between the sophomore and junior years. Prior Service Solders who have completed Basic Training also receive credit for the basic course. The advanced course, taken during a student's junior and senior years, is designed to prepare students for commissioned service. The first year of instruction (first two years for co-op students) is directed toward preparing students for the Advanced Camp at Fort Knox, Kentucky. The final year of instruction is devoted to prepare students to be commissioned officers.

To be admitted to the advanced course, a student must have credit for the two-year basic course, volunteer, be selected by the professor of military science, and successfully complete the required screening and physical tests.

Enlisted Army Reservists and National Guardsmen may apply for the Simultaneous Membership Program, which permits them to serve as officer trainees with their units and receive commissions upon completion of the ROTC advanced course.

Airborne training, Air Assault training, Mountain Warfare training, Northern Warfare training, and Cadet Troop Leadership Training with a Regular Army unit are also available to select interested Cadets.

Twice per school year, Cadets are required to participate in a leadership development exercise. These exercises are usually two to three days in duration and are conducted at Fort Dix, New Jersey, or other military instillations. The field training exercises give students a chance to practice skills learned in the classroom and Leadership Laboratories. Contracted students are also required to attend the Advanced Camp over the summer between their Junior and Senior years. The Department of Military Science will work with the co-op coordinators to allow co-op Cadets to attend this training

Uniforms worn during Leadership Laboratory periods and leadership development exercises are issued free of charge to all students enrolled in ROTC. Students are responsible for maintaining the uniforms and returning them upon commissioning or leaving the program.

Students who satisfactorily complete ROTC course requirements are commissioned as Second Lieutenants in the United States Army, Army Reserve, or National Guard. Drexel graduates who receive their commission through ROTC may apply for a commission in any branch of the Army for which they are qualified.

Further information on the scholarships and Army ROTC is available from the Drexel University ROTC Battalion (https://www.taskforcedragonarmyrotc.com/) at 267-359-6300.

Plan of Study (4 year)

First Year

Fall		Credits
MLSC 101	Basic Leadership Lab/Practicum	0.0
MLSC 110	Leadership and Personal Developmnt	1.0
	Term Credits	1.0

Winter		
MLSC 102	Basic Leadership Lab/Practicum	0.0
MLSC 120	Foundations in Leadership	1.0
	Term Credits	1.0

Spring		
MLSC 103	Basic Leadership Lab/Practicum	0.0
MLSC 130	Continuing Studies: Foundations in Leadership	1.0
	Term Credits	1.0

Second Year

Fall		
MLSC 201	Basic Leadership Lab/Practicum	0.0
MLSC 210	Innovative Tactical Leadership	2.0
	Term Credits	2.0

Winter		
MLSC 202	Basic Leadership Lab/Practicum	0.0
MLSC 220	Leadership in Changing Environments	2.0
	Term Credits	2.0

Spring		
MLSC 203	Basic Leadership Lab/Practicum	0.0
MLSC 230	Adaptive Team Leadership	2.0
	Term Credits	2.0

Third Year

Fall

MLSC 301	Leadership Lab/Practicum	0.0
MLSC 310	Leadership in Contact	2.0
	Term Credits	2.0

Winter

MLSC 302	Leadership Lab/Practicum	0.0
MLSC 320	Complex Team Leadership Issues	2.0
	Term Credits	2.0

Spring

MLSC 303	Leadership Lab/Practicum	0.0
MLSC 330	Military Leadership Co-op Preparation	2.0
	Term Credits	2.0

Fourth Year

Fall

MLSC 401	Leadership Lab/Practicum	0.0
MLSC 410	Developing Adaptive Leaders	2.0
	Term Credits	2.0

Winter

MLSC 402	Leadership Lab/Practicum	0.0
MLSC 420	Leadership in Contemporary Environments	2.0
	Term Credits	2.0

Spring

MLSC 403	Leadership Lab/Practicum	0.0
MLSC 430	Advanced Leadership in Contemporary Environments	2.0
	Term Credits	2.0

Total Credit: 21.0

Plan of Study (5 year)

First Year

Fall

		Credits
MLSC 101	Basic Leadership Lab/Practicum	0.0
MLSC 110	Leadership and Personal Developmnt	1.0
	Term Credits	1.0

Winter

MLSC 102	Basic Leadership Lab/Practicum	0.0
MLSC 120	Foundations in Leadership	1.0
	Term Credits	1.0

Spring

MLSC 103	Basic Leadership Lab/Practicum	0.0
MLSC 130	Continuing Studies: Foundations in Leadership	1.0
	Term Credits	1.0

Second Year

Fall

MLSC 201	Basic Leadership Lab/Practicum	0.0
MLSC 210	Innovative Tactical Leadership	2.0
	Term Credits	2.0

Winter

MLSC 202	Basic Leadership Lab/Practicum	0.0
MLSC 220	Leadership in Changing Environments	2.0
	Term Credits	2.0

Third Year

Fall

MLSC 203	Basic Leadership Lab/Practicum	0.0
MLSC 230	Adaptive Team Leadership	2.0
	Term Credits	2.0

Winter

MLSC 303	Leadership Lab/Practicum	0.0
MLSC 330	Military Leadership Co-op Preparation	2.0
	Term Credits	2.0

Fourth Year

Fall

MLSC 302	Leadership Lab/Practicum	0.0
MLSC 320	Complex Team Leadership Issues	2.0
	Term Credits	2.0

Winter

MLSC 301	Leadership Lab/Practicum	0.0
MLSC 310	Leadership in Contact	2.0
	Term Credits	2.0

Fifth Year

Fall

MLSC 401	Leadership Lab/Practicum	0.0
MLSC 410	Developing Adaptive Leaders	2.0
	Term Credits	2.0

Winter

MLSC 402	Leadership Lab/Practicum	0.0
MLSC 420	Leadership in Contemporary Environments	2.0
	Term Credits	2.0

Spring

MLSC 403	Leadership Lab/Practicum	0.0
MLSC 430	Advanced Leadership in Contemporary Environments	2.0
	Term Credits	2.0

Total Credit: 21.0

Military History Requirement

To receive a commission, cadets must also take one of the following courses:

HIST 230	United States Military History I (before 1900)	4.0
HIST 231	US Military History II (since 1900)	4.0

Naval Reserve Officers' Training Corp (NROTC)

About the Program

Students are eligible to participate in the Naval Reserve Officers' Training Corps (http://www.vpul.upenn.edu/nrotc/) (NROTC) through a cross-enrollment agreement with the University of Pennsylvania. All naval science courses are held on Penn's campus. The NROTC program enables a college student to earn a commission in the Navy or the Marine Corps while concurrently satisfying requirements for his or her baccalaureate degree. Scholarship and nonscholarship programs are available.

Navy-option scholarship and college program (nonscholarship) students must enroll in Naval Science (NSC) NSC 101 and NSC 102 during their freshman year, NSC 201 and NSC 202 during their sophomore year, NSC 301 and NSC 302 in their junior year, and NSC 401 and NSC 402 in their senior year. Those seeking commissions in the Marine Corps will enroll in NSC 310 and NSC 410 instead of NSC 301-302 and NSC 401-402.

Scholarship program students must complete one year of calculus, one year of calculus-based physics, a course in computer science, one course in American military history/national security policy, and one year of English. College program students must complete one year of college-level algebra, one year of physical science courses, one semester of a computer science course, and one year of English. Students must check with their naval science instructors to determine specific courses that fulfill the above requirements.

In addition to the above, all students are required to attend a two-hour professional laboratory period scheduled on Wednesday afternoons (no academic credit) that emphasizes military drill, physical fitness, and leadership/military topics.

For further information regarding physical and other qualifications for admission and other matters pertaining to participation in the NROTC (http://www.vpul.upenn.edu/nrotc/) program, you can write to the Professor of Naval Science, NROTC Unit, 417 Hollenback Center, 3000 South Street, Philadelphia, PA 19104-6399; 215-898-7436; fax: 215-573-2067.

Plan of Study

First Year

Term 1		Credits
NSC 100	Naval Science Drill	0.0
NSC 102	Seapower and Maritime Affairs	2.0
	Term Credits	2.0

Second Year

Term 1		
NSC 201	Leadership & Management	2.0
	Term Credits	2.0

Third Year

Term 1		
NSC 301	Engineering	2.0
NSC 302	Weapons	2.0
	Term Credits	4.0

Fourth Year

Term 1

NSC 401	Navigation II	2.0
NSC 402	Leadership and Ethics	2.0
	Term Credits	4.0

Total Credit: 12.0

Air Force Reserve Officers' Training Corp (AFROTC)

About the Program

Students are eligible to participate in the Air Force Reserve Officers' Training Corps (http://www.sju.edu/afrotc/) (AFROTC) through a cross-enrollment agreement with St. Joseph's University. All aerospace studies courses will be held on the St. Joseph's campus. The AFROTC program enables a college student to earn a commission as an Air Force officer while concurrently satisfying requirements for his or her baccalaureate degree.

The Department of Aerospace Studies offered through Detachment 750 at St. Joseph's University offers college students a three- or four-year curriculum leading to a commission as a Second Lieutenant in the United States Air Force (USAF). In the four-year option, a student (cadet) takes General Military Course (GMC) classes during his/her freshman and sophomore years, attends a four-week summer training program between his/her sophomore and junior years, and then takes the Professional Officer Course (POC) classes during his/her junior and senior years. A cadet is under no contractual obligation with the USAF until entering the POC or accepting an AFROTC scholarship. The GMC curriculum focuses on the scope, structure, organization, and history of the USAF with an emphasis on the development of airpower and its relationship to current events. The POC curriculum concentrates on the concepts and practices of leadership and management, and the role of national security forces in American society.

In addition to the academic portion of the curricula, each cadet participates in a two-hour Leadership Laboratory each week. Leadership Laboratory utilizes the cadet organization designed for the practice of leadership and management techniques.

Further information on the AFROTC program at Saint Joseph's University can be found at sites.sju.edu/afrotc (http://sites.sju.edu/afrotc/), or students can contact detachment personnel directly at:

Unit Admissions Officer
AFROTC Detachment 750
Saint Joseph's University
Philadelphia, PA 19131
Phone: 610-660-3190
Email: rotc@sju.edu

Lindy Center for Civic Engagement

Drexel University's Lindy Center for Civic Engagement fosters a culture of civic responsibility by providing programs and resources that empower Drexel students and the broader university community to expand their civic identities through engagement in mutually beneficial partnerships that lead to a more just society.

The Lindy Center for Civic Engagement focuses on four core priorities including: Community-Based Learning, Civic Leadership, Public Service, and Community Partnerships.

For more information, view the Lindy Center's web page (http://www.drexel.edu/lindycenter/).

Community College Articulation Agreements

Dual Admission Transfer Agreements with Community Colleges

Advising is required at the Community College and Drexel University in order to approve each transfer student application. Please use the Sample Plans of Study as a guide for suggested coursework for articulation agreements with Drexel University.

Community College of Philadelphia

Degree Programs in the Close School of Entrepreneurship

Degree Programs in the College of Arts and Sciences

Degree Programs in the College of Business

Degree Programs in the College of Engineering

Degree Programs in the College of Nursing and Health Professions

Degree Programs in the Goodwin College of Professional Studies

Degree Programs in the School of Education

BS in Architectural Engineering, Mechanical Concentration

Drexel Degree Name: B.S. Architectural Engineering, Mechanical (Building Systems)

Community College Degree Name: A.S. in Engineering Science

Sample Plan of Study - First & Second Year at Community College of Philadelphia

60 semester credits from CCP transfers over as 69.5-70.5 credits to Drexel

Please contact the Department of Civil, Architectural and Environmental Engineering **(**https://drexel.edu/engineering/academics/departments/civil-architectural-environmental-engineering/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
CHEM 101	General Chemistry I (CCP= CHEM 121 [4])	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP= ENGL 101 [3]) English Composition I	3.0
MATH 121	Calculus I (CCP= MATH 171 [4])	4.0
ENGR 111	Introduction to Engineering Design & Data Analysis (CCP = ENGR 102 (3))	3.0
Free Elective (CCP= CIS 103 [3])		4.5
	Term Credits	18.0

Spring		
At Community College		
MATH 122	Calculus II (CCP= MATH 172 [4])	4.0
ENGR 113	First-Year Engineering Design (CCP = ENGR 202 (3))	3.0
PHYS 101	Fundamentals of Physics I (CCP= PHYS 140 [5])	4.0
MATH 201[*]	Linear Algebra (CCP = MATH 270 (4))	4.0
	Term Credits	15.0

Summer		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102 [3])	6.0
	Term Credits	6.0

Second Year

Fall		
At Community College		
CHEM 102	General Chemistry II (CCP= CHEM 122 [4])	4.5
MATH 200	Multivariate Calculus (CCP= MATH 271 [4])	4.0
MEM 202	Statics (CCP= ENGR 221 [3])	3.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (CCP= PHY 241 [5])	8.0
	Term Credits	19.5

Spring		
At Community College		
CS 190 or ENGR 220	Selected Computer Language (CCP= CSCI 111 or ENGR 205 [4]) Fundamentals of Materials	3.0-4.0
MEM 238	Dynamics (CCP= ENGR 222 [3])	4.0

MATH 210[**]	Differential Equations (CCP = MATH 272 (4))	4.0
	Term Credits	11.0-12.0

Third Year
Fall
At Drexel

ARCH 141	Architecture and Society I	3.0
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
MEM 230	Mechanics of Materials I	4.0
ENGR 220 or 131	Fundamentals of Materials Introductory Programming for Engineers	3.0-4.0
COOP 101	Career Management and Professional Development	0.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	14.0-15.0

Winter
At Drexel

ARCH 191	Studio 1-AE	3.0
CIVC 101	Introduction to Civic Engagement	1.0
CAEE 203	System Balances and Design in CAEE	3.0
ENGR 210	Introduction to Thermodynamics	3.0
ARCH 142	Architecture and Society II	3.0
CIVE 250	Construction Materials	4.0
	Term Credits	17.0

Spring
At Drexel
CO-OP

	Term Credits	0.0

Summer
At Drexel
CO-OP

	Term Credits	0.0

Fourth Year
Fall
At Drexel

AE 340	Architectural Illumination and Electrical Systems	3.0
ARCH 192	Studio 2-AE	3.0
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
CIVE 320	Introduction to Fluid Flow	3.0
CIVE 302	Structural Analysis I	4.0
	Term Credits	17.0

Winter
At Drexel

AE 220	Introduction to HVAC	3.5
CIVE 240 [WI]	Engineering Economic Analysis	3.0
CIVE 303	Structural Design I	3.0
CIVE 330	Hydraulics	4.0
	Term Credits	13.5

Spring
At Drexel
CO-OP

	Term Credits	0.0

Summer
At Drexel
CO-OP

	Term Credits	0.0

Fifth Year
Fall
At Drexel

AE 390	Architectural Engineering Design I	4.0
ARCH 143	Architecture and Society III	3.0
CAEE 361	Statistical Analysis of Engineering Systems	3.0
MEM 345	Heat Transfer	4.0
	Term Credits	14.0

Winter
At Drexel

AE 391	Architectural Engineering Design II	4.0
BIO 141	Essential Biology	4.5
Professional Elective		3.0
General Education Elective		3.0
	Term Credits	14.5

Spring
At Drexel
CO-OP

	Term Credits	0.0

Summer
At Drexel
CO-OP

	Term Credits	0.0

Sixth Year
Fall
At Drexel

AE 544	Building Envelope Systems	3.0
CAE 491 [WI]	Senior Design Project I	3.0
MEM 413	HVAC Loads	3.0
General Education Elective		3.0
	Term Credits	12.0

Winter
At Drexel

CAE 492 [WI]	Senior Design Project II	3.0
MEM 414	HVAC Equipment	3.0
Professional Elective		3.0
General Education Elective		3.0
	Term Credits	12.0

Spring
At Drexel

AE 430	Control Systems for HVAC	3.0
CAE 493 [WI]	Senior Design Project III	3.0
Professional Elective		3.0
General Education Elective		3.0
	Term Credits	12.0

Total Credit: 195.5-197.5

[*] MATH 201 sub for ENGR 231

[**] MATH 210 sub for ENGR 232

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-

program/). (http://drexel.edu/coas/academics/departments-centers/
english-philosophy/university-writing-program/drexel-writing-center/)
Students scheduling their courses can also conduct a search for courses
with the attribute "WI" to bring up a list of all writing-intensive courses
available that term.

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent
to courses offered in the desired curriculum at Drexel and students must
have completed the courses with a grade of C (C=2.0) or better. The
transfer courses listed should be used as a general guide and might not
be acceptable for every major at the University. Drexel University makes
every effort to keep this guide current, but cannot guarantee that every
course will be acceptable for transfer. The number of credits a student can
transfer will be determined by the academic department once the student
has been accepted into the program.

BS in Architectural Engineering - Structural Engineering

Drexel Degree Name: B.S. Architectural Engineering, Structural Concentration

Community College Degree Name: A.S. in Engineering Science

Sample Plan of Study - First & Second Year at Community College of Philadelphia

62 Credits at CCP transfer over as 74-75 Credits at Drexel

Please contact the Department of Civil, Architectural and Environmental Engineering **(**https://drexel.edu/engineering/academics/departments/civil-architectural-environmental-engineering/**) for the most current Plan of Study.**

First Year

Fall		**Credits**
At Community College		
CHEM 101	General Chemistry I (CCP= CHEM 121 [4])	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP= ENGL 101 [3]) English Composition I	3.0
MATH 121	Calculus I (CCP= MATH 171 [4])	4.0
ENGR 111	Introduction to Engineering Design & Data Analysis (CCP = ENGR 102 (3))	3.0
	Term Credits	13.5

Spring		
At Community College		
MATH 122	Calculus II (CCP= MATH 172 [4])	4.0
PHYS 101	Fundamentals of Physics I (CCP= PHYS 140 [5])	4.0
MATH 201	Linear Algebra (CCP = MATH 270 (4))	4.0
Sub for ENGR 231		
ENGR 113	First-Year Engineering Design (CCP = ENGR 202 (3))	3.0
	Term Credits	15.0

Summer		
At Community College		

ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102 [3])	6.0
	Term Credits	6.0

Second Year		
Fall		
At Community College		
CHEM 102	General Chemistry II (CCP= CHEM 122)	4.5
MATH 200	Multivariate Calculus (CCP = MATH 271 (4))	4.0
MEM 202	Statics (CCP= ENGR 221 [3])	3.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (CCP= PHY 241 [5])	8.0
	Term Credits	19.5

Spring		
At Community College		
CS 190 & ENGR 220	Selected Computer Language (CCP= CSCI 111 or ENGR 205 [4])	3.0-4.0
MEM 238	Dynamics (CCP= ENGR 222 [3])	4.0
MATH 210	Differential Equations	4.0
sub for ENGR 232		
	General Education Elective (CCP= Human Elective [3])	4.5
	General Education Elective (CCP= Social Science Elective [3])	4.5
	Term Credits	20.0-21.0

Third Year		
Fall		
ARCH 141	Architecture and Society I	3.0
MEM 230	Mechanics of Materials I	4.0
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
ENGR 220 or 131	Fundamentals of Materials Introductory Programming for Engineers	3.0-4.0
UNIV E101	The Drexel Experience	1.0
COOP 101	Career Management and Professional Development	0.0
	Term Credits	14.0-15.0

Winter		
ARCH 191	Studio 1-AE	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 210	Introduction to Thermodynamics	3.0
CAEE 203	System Balances and Design in CAEE	3.0
CIVE 250	Construction Materials	4.0
ARCH 142	Architecture and Society II	3.0
	Term Credits	17.0

Spring		
CO-OP		
	Term Credits	0.0

Summer		
CO-OP		
	Term Credits	0.0

Fourth Year		
Fall		
AE 340	Architectural Illumination and Electrical Systems	3.0
ARCH 192	Studio 2-AE	3.0
CIVE 320	Introduction to Fluid Flow	3.0
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
CIVE 302	Structural Analysis I	4.0
	Term Credits	17.0

Winter		
AE 220	Introduction to HVAC	3.5
CIVE 330	Hydraulics	4.0
CIVE 303	Structural Design I	3.0
BIO 141	Essential Biology	4.5
Professional Elective		3.0
	Term Credits	18.0

Spring		
CO-OP		
	Term Credits	0.0
Summer		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
CIVE 312	Soil Mechanics I	4.0
AE 390	Architectural Engineering Design I	4.0
CAEE 361	Statistical Analysis of Engineering Systems	3.0
ARCH 143	Architecture and Society III	3.0
General Education Elective		3.0
	Term Credits	17.0
Winter		
AE 391	Architectural Engineering Design II	4.0
BIO 141	Essential Biology	4.5
CIVE 240 [WI]	Engineering Economic Analysis	3.0
CIVE 315	Soil Mechanics II	4.0
Professional Elective		3.0
	Term Credits	18.5
Spring		
CO-OP		
	Term Credits	0.0
Summer		
CO-OP		
	Term Credits	0.0
Sixth Year		
Fall		
CAE 491 [WI]	Senior Design Project I	3.0
AE 544	Building Envelope Systems	3.0
CIVE 400	First Principles of Structural Design	3.0
	Term Credits	9.0
Winter		
CAE 492 [WI]	Senior Design Project II	3.0
CIVE 401	Structural Design II	3.0
	Term Credits	6.0
Spring		
CAE 493 [WI]	Senior Design Project III	3.0
CIVE 402	Structural Design III	3.0
	Term Credits	6.0

Total Credit: 196.5-198.5

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/

english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credit
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Business Administration - Major in Accounting

Drexel Degree: B.S. in Business Administration; Major in Accounting

Community College Degree: A.S. in Business Administration

Sample Plan of Study - First & Second Year at Community College of Philadelphia

64 Credits at CCP transfers over as 87 Credits at Drexel

Please contact the Department of Accounting **(**https://www.lebow.drexel.edu/faculty-and-research/disciplines/accounting/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ACCT 115	Financial Accounting Foundations (CCP= ACCT 101 [4])	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP= ENGL 101 [3]) English Composition I	3.0
MATH 101	Introduction to Analysis I (CCP=MATH 162 [3])	4.0
Free Elective (CCP=BUSL 101 [3])		3.0
Science Elective (CCP=CIS 103 [3])		3.0
	Term Credits	17.0

Spring		
At Community College		
ACCT 116	Managerial Accounting Foundations (CCP= ACCT 102 [3])	4.0
BUSN 111	Foundations for Business (CCP= MNGT 121 [3])	4.0
ECON 202	Principles of Macroeconomics (CCP= ECON 181 [3])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102 [3])	6.0
MATH 102	Introduction to Analysis II (CCP= MATH 171 [4])	4.0
	Term Credits	22.0

Second Year

Fall

At Community College		
ECON 201	Principles of Microeconomics (CCP= ECON 181 [3])	4.0
MKTG 201	Introduction to Marketing Management (CCP= MKTG 131 [3])	4.0
STAT 201	Introduction to Business Statistics (CCP= ECON 112 [4])	4.0
History Elective (CCP= HIST 121 or 122 [3])		4.0
Free Elective (CCP= MNGT 141 [3])		3.0
	Term Credits	19.0
Spring		
At Community College		
BLAW 201	Business Law I (CCP= MNGT 262 [3])	4.0
CHEM 151, BIO 100, or PHYS 151	Applied Chemistry (CCP= CHEM 101, BIOL 106 or PHYS 111 [4]) Applied Cells, Genetics & Physiology Applied Physics	3.0
MIS 200	Management Information Systems (CCP= MNGT 142 [3])	4.0
Society & Culture Elective (CCP= ENGL 115 or 117 [3])		3.0
Social Science Elective (CCP= ANTH 112 or GEOG 103 [3])		3.0
Excess Free Elective Credit		12.0
	Term Credits	29.0
Third Year		
Fall		
At Drexel		
ACCT 321	Financial Reporting I	4.0
BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	3.0
COOP 101	Career Management and Professional Development	0.0
FIN 301	Introduction to Finance	4.0
UNIV B101	The Drexel Experience	1.0
English Literature Elective		3.0
	Term Credits	15.0
Winter		
At Drexel		
OPM 200	Operations Management	4.0
ACCT 322	Financial Reporting II	4.0
INTB 200	International Business	4.0
PSY 101	General Psychology I	3.0
	Term Credits	15.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fourth Year		
Fall		
At Drexel		
ACCT 323	Financial Reporting III	4.0
CIVC 101	Introduction to Civic Engagement	1.0
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 202, MGMT 260, MGMT 451, MGMT 370, or MGMT 371	Business Statistics II Introduction to Entrepreneurship Management Simulation For-Profit Business Consulting Nonprofit Business Consulting	4.0
General Education Elective		3.0
	Term Credits	16.0
Winter		
At Drexel		
ACCT 329	Advanced Accounting	4.0
COM 270 [WI]	Business Communication	3.0
TAX 341	Individual Income Taxes	4.0

Fine Arts Elective		3.0
BUSN Elective		4.0
	Term Credits	18.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
ACCT 331	Cost Accounting	4.0
PHIL 105	Critical Reasoning	3.0
TAX 342	Business Income Taxes	4.0
General Education Electives		6.0
	Term Credits	17.0
Winter		
At Drexel		
ACCT 341	Principles of Auditing	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
UNIV B201 [WI]	Career Management	1.0
General Education Elective		3.0
	Term Credits	12.0

Total Credit: 180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every

course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Business Administration - Major in Finance

Drexel Degree: B.S. in Business Administration; Major in Finance

Community College Degree: A.A. in Business Administration

Sample Plan of Study - First & Second Year at Community College of Philadelphia

64 Credits at CCP Transfer as 84-87 Credits at Drexel

First Year

Fall		**Credits**
At Community College	
ACCT 115	Financial Accounting Foundations (CCP= ACCT 101 [4])	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP= ENGL 101 [3]) English Composition I	3.0
MATH 101	Introduction to Analysis I (CCP= MATH 162 [3])	4.0
Science Elective (CCP= CIS 103 [3])		3.0
Free Elective (CCP= BUSL 101 [3])		3.0
Term Credits	17.0

Spring | |
---|---|---
At Community College | |
ACCT 116 | Managerial Accounting Foundations (CCP= ACCT 102 [3]) | 4.0
BUSN 111 | Foundations for Business (CCP= MNGT 121 [3]) | 4.0
ECON 202 | Principles of Macroeconomics (CCP= ECON 181 [3]) | 4.0
ENGL 102 & ENGL 103 | Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP = ENGL 102 [3]) | 3.0-6.0
MATH 102 | Introduction to Analysis II (CCP= MATH 171 [4]) | 4.0
| Term Credits | 19.0-22.0

Second Year

Fall | |
---|---|---
At Community College | |
ECON 201 | Principles of Microeconomics (CCP= ECON 182 [3]) | 4.0
MKTG 201 | Introduction to Marketing Management (CCP= MKTG 131 [3]) | 4.0
STAT 201 | Introduction to Business Statistics (CCP= ECON 112 [4]) | 4.0
HIST Elective (CCP= HIST 121 OR HIST 122 [3]) | | 4.0
Free Elective (CCP= MNGT 141 [3]) | | 3.0
| Term Credits | 19.0

Spring | |
---|---|---
At Community College | |
BLAW 201 | Business Law I (CCP= MNGT 262 [3]) | 4.0
CHEM 151, BIO 100, or PHYS 151 | Applied Chemistry (CCP= CHEM 101 OR BIOL 106 OR PHYS 111 OR Higher [4]) Applied Cells, Genetics & Physiology Applied Physics | 3.0
MIS 200 | Management Information Systems (CCP= MNGT 142 [3]) | 4.0
Sociology & Culture Elective (CCP= ENGL 115 OR ENGL 117 [3]) | | 3.0
Social Science Elective (CCP= ANTH 112 OR GEOG 103 [3]) | | 3.0
Excess Free Elective Credits | | 12.0
| Term Credits | 29.0

Third Year

Fall | |
---|---|---
At Drexel | |
BIO 100 or 101 | Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution | 3.0
COOP 101 | Career Management and Professional Development | 0.0
FIN 301 | Introduction to Finance | 4.0
STAT 202 | Business Statistics II | 4.0
UNIV B101 | The Drexel Experience | 1.0
English Literature Elective | | 3.0
| Term Credits | 15.0

Winter | |
---|---|---
At Drexel | |
FIN 302 | Intermediate Corporate Finance | 4.0
INTB 200 | International Business | 4.0
OPM 200 | Operations Management | 4.0
PSY 101 | General Psychology I | 3.0
| Term Credits | 15.0

Spring | |
---|---|---
At Drexel | |
CO-OP | |
| Term Credits | 0.0

Summer | |
---|---|---
At Drexel | |
CO-OP | |
| Term Credits | 0.0

Fourth Year

Fall | |
---|---|---
At Drexel | |
CIVC 101 | Introduction to Civic Engagement | 1.0
ORGB 300 [WI] | Organizational Behavior | 4.0
FIN 321 | Investment Securities & Markets | 4.0
FIN 325 | Financial Institutions and Markets | 4.0
General Education Electives | | 3.0
| Term Credits | 16.0

Winter | |
---|---|---
At Drexel | |
COM 270 [WI] | Business Communication | 3.0
FIN Elective | | 4.0
Business Elective | | 4.0
FIN Elective | | 4.0
Fine Arts | | 3.0
| Term Credits | 18.0

Spring | |
---|---|---
At Drexel | |
CO-OP | |
| Term Credits | 0.0

Summer | |
---|---|---
At Drexel | |
CO-OP | |
| Term Credits | 0.0

Fifth Year

Fall | |
---|---|---
At Drexel | |
PHIL 105 | Critical Reasoning | 3.0
General Education Electives | | 6.0
FIN Elective | | 4.0
FIN Elective | | 4.0
| Term Credits | 17.0

Winter | |
---|---|---
At Drexel | |

MGMT 450	Strategy and Competitive Advantage	4.0
UNIV B201 [WI]	Career Management	1.0
FIN Elective		4.0
General Education Elective		3.0
	Term Credits	12.0

Total Credit: 177.0-180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Business Administration - Major in Marketing

Drexel Degree: B.S. in Business Administration; Major in Marketing

Community College Degree: A.A. in Business Administration

Sample Plan of Study - First & Second Year at Community College of Philadelphia

61 Credits at CCP Transfer to 87 Credits at Drexel

Please contact the Department of Marketing **(**https://www.lebow.drexel.edu/faculty-and-research/disciplines/marketing/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ACCT 115	Financial Accounting Foundations (CCP= ACCT 101 [4])	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP= ENGL 101 [3]) English Composition I	3.0
MATH 101	Introduction to Analysis I (CCP= MATH 162 [3])	4.0
Free Elective (CCP= BUSL 101 [3])		3.0
Science Elective (CCP= CIS 103 [3]		3.0
	Term Credits	17.0

Spring		
At Community College		
ACCT 116	Managerial Accounting Foundations (CCP= ACCT 102 [3])	4.0
BUSN 111	Foundations for Business (CCP= MNGT 121: Intro to Business [3])	4.0
ECON 202	Principles of Macroeconomics (CCP= ECON 181 [3])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102 [3])	3.0-6.0
MATH 102	Introduction to Analysis II (CCP= MATH 171 [4])	4.0
	Term Credits	19.0-22.0

Second Year

Fall		
At Community College		
ECON 201	Principles of Microeconomics (CCP= ECON 182 [3])	4.0
MKTG 201	Introduction to Marketing Management (CCP= MKTG 131 [3])	4.0
STAT 201	Introduction to Business Statistics (CCP= ECON 112 [4])	4.0
Free elective (CCP= MNGT 141 [3])		3.0
HIST Elective (CCP= HIST 121 or HIST 122 [3])		4.0
	Term Credits	19.0

Spring		
At Community College		
BLAW 201	Business Law I (CCP= MNGT 262 [3])	4.0
CHEM 151 or BIO 100	Applied Chemistry (CCP= CHEM 101 OR BIOL 106 OR PHYS 111 OR higher [4]) Applied Cells, Genetics & Physiology	3.0
MIS 200	Management Information Systems (CCP= ECON 114 or FIN 151 OR MGNT 142 [3])	4.0
Society & Culture Elective; (CCP= ENGL 115 OR ENGL 117 [3])		3.0
Social Science Elective; (CCP= ANTH 112 OR GEOG 103 [3])		3.0

Excess Free Elective Credits		12.0
	Term Credits	29.0

Third Year
Fall
At Drexel

BIO 100 or 101	Applied Cells, Genetics & Physiology Applied Biological Diversity, Ecology & Evolution	3.0
COOP 101	Career Management and Professional Development	0.0
FIN 301	Introduction to Finance	4.0
UNIV B101	The Drexel Experience	1.0
English Literature Elective		3.0
MKTG Elective		4.0
	Term Credits	15.0

Winter
At Drexel

INTB 200	International Business	4.0
OPM 200	Operations Management	4.0
PSY 101	General Psychology I	3.0
MKTG 326	Marketing Insights	4.0
	Term Credits	15.0

Spring
At Drexel
CO-OP

	Term Credits	0.0

Fourth Year
Fall
At Drexel

CIVC 101	Introduction to Civic Engagement	1.0
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 202, MGMT 260, MGMT 451, MGMT 370, or MGMT 371	Business Statistics II Introduction to Entrepreneurship Management Simulation For-Profit Business Consulting Nonprofit Business Consulting	4.0
MKTG Elective		4.0
MKTG 356	Consumer Behavior	4.0
	Term Credits	17.0

Winter
At Drexel

COM 270 [WI]	Business Communication	3.0
STAT 202, MGMT 260, MGMT 451, MGMT 370, or MGMT 371	Business Statistics II Introduction to Entrepreneurship Management Simulation For-Profit Business Consulting Nonprofit Business Consulting	4.0
Fine Arts		3.0
MKTG Elective		4.0
MKTG Elective		4.0
	Term Credits	18.0

Spring
At Drexel
CO-OP

	Term Credits	0.0

Summer
At Drexel
CO-OP

	Term Credits	0.0

Fifth Year
Fall
At Drexel

PHIL 105	Critical Reasoning	3.0
MKTG Elective		4.0

General Education Electives		9.0
	Term Credits	16.0

Winter
At Drexel

MGMT 450	Strategy and Competitive Advantage	4.0
MKTG 380	Seminar in Marketing Strategy	4.0
UNIV B201 [WI]	Career Management	1.0
General Education Elective		3.0
	Term Credits	12.0

Total Credit: 177.0-180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Biological Sciences

Drexel Degree: B.S. Biological Sciences
Community College Degree: A.S in Biology

Sample Plan of Study - First & Second Year at Community College of Philadelphia

65 Credits from CCP transfers over as 90 Credits at Drexel

First Year

Fall		Credits
At Community College		
CHEM 101	General Chemistry I (CCP= CHEM 121 [4])	3.5
CS 161	Introduction to Computing (CCP = CIS 103 [3])	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP = ENGL 101 [3])	3.0
MATH 101	Introduction to Analysis I (CCP = MATH 162 [3])	4.0
Humanities and Social Science Elective (CCP = SOC 101 [3])		3.0
	Term Credits	16.5

Spring		
At Community College		
BIO 122	Cells and Genetics (CCP = BIOL 123 [4])	4.5
CHEM 102 & CHEM 103	General Chemistry II (CCP = CHEM 122 [4])	9.5
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP = ENGL 102 [3])	6.0
ANTH 101	Introduction to Cultural Diversity (CCP = *Take HUM 101 [3] for Humanities elective)	3.0
PSY 101	General Psychology I (CCP = PSYC 101 [3])	3.0
	Term Credits	26.0

Second Year

Fall		
At Community College		
BIO 124 & BIO 126	Evolution & Organismal Diversity (CCP = BIOL 124 [4])	9.0
CHEM 241	Organic Chemistry I (CCP = CHEM 221 [5])	4.0
MATH 102	Introduction to Analysis II (CCP = MATH 171 [4])	4.0
BIO 244 (3) + BIO T280 Genetics Lab (2) (CCP = *take BIOL 211 [4])		5.0
	Term Credits	22.0

Spring		
At Community College		
CHEM 242 & CHEM 243	Organic Chemistry II (CCP = CHEM 222 [5])	7.0
COM 230	Techniques of Speaking (CCP = ENGL 115 [3])	3.0
ENVS 230 + BIO T280 Ecology Lab (2) (CCP = *take BIOL 225 [4])		5.0
PHIL 101	Introduction to Western Philosophy (CCP = PHIL 101[3])	3.0
Excess free elective credits from semester to Drexel credits		7.5
	Term Credits	25.5

Third Year

Fall		
At Drexel		
BIO 209	Cell, Molecular & Developmental Biology I	4.0
BIO 207	Applications in Biology I	1.0
PHYS 152	Introductory Physics I	4.0
PHIL 251	Ethics	3.0
MATH 239	Mathematics for the Life Sciences	4.0
COOP 101	Career Management and Professional Development	0.0
	Term Credits	16.0

Winter		
At Drexel		
BIO 211	Cell, Molecular & Developmental Biology II	4.0
BIO 208	Applications in Biology II	1.0
BIO 219 [WI]	Techniques in Molecular Biology	3.0
PHYS 153	Introductory Physics II	4.0
UNIV S201	Looking Forward: Academics and Careers	1.0
Free Elective		3.0
	Term Credits	16.0

Spring		
At Drexel		
CO-OP		
	Term Credits	0.0

Summer		
At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall		
At Drexel		
BIO 311	Biochemistry	4.0
CIVC 101	Introduction to Civic Engagement	1.0
PHYS 154	Introductory Physics III	4.0
Free Elective		3.0
BIO CONC Elective		3.0
	Term Credits	15.0

Winter		
At Drexel		
BIO 224	Form, Function & Evolution of Vertebrates	4.0
BIO 225	Vertebrate Biology and Evolution Laboratory	2.0
COM 310 [WI]	Technical Communication	3.0
BIO CONC Elective		3.0
Sci, Tech, Hlth & Hum Affairs Elective		3.0
	Term Credits	15.0

Spring		
At Drexel		
CO-OP		
	Term Credits	0.0

Summer		
At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall		
At Drexel		
BIO 471	Seminar in Biological Sciences	2.0
ENVS 212	Evolution	4.0
MATH 410	Scientific Data Analysis I	3.0
BIO CONC Elective		3.0
BIO/ENVS Elective		3.0
	Term Credits	15.0

Winter		
At Drexel		
BIO 472	Seminar in Biological Sciences	2.0
MATH 411	Scientific Data Analysis II	3.0
BIO/ENVS Elective		3.0
BIO CONC Elective		3.0
Free electives		6.0
	Term Credits	17.0

Total Credit: 184.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Chemical Engineering

Drexel Degree Name: B.S. Chemical Engineering

Community College Degree Name: A.S. in Engineering Science

Sample Plan of Study - First & Second Year at Community College of Philadelphia

67 Credits at CCP transfers over as 70.5-73.5 Credits at Drexel

First Year

Fall

		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP= ENGL 101 [3]) English Composition I	3.0
CHEM 101	General Chemistry I (CCP= CHEM 121 [4])	3.5
ENGR 111	Introduction to Engineering Design & Data Analysis (CCP = ENGR 102 [3])	3.0
MATH 121	Calculus I (CCP= MATH 171 [4])	4.0
	Term Credits	13.5

Spring

At Community College

MATH 122	Calculus II (CCP= MATH 172 [4])	4.0
ENGR 113	First-Year Engineering Design (CCP = ENGR 202 [3])	3.0
PHYS 101	Fundamentals of Physics I (CCP= PHYS 140 [5])	4.0
MATH 201	Linear Algebra (CCP = MATH 270 [4])	4.0
	Term Credits	15.0

Summer

At Community College

CHEM 102	General Chemistry II (CCP= CHEM 122 [4])	4.5
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102 [3])	6.0
	Term Credits	10.5

Second Year

Fall

At Community College

CHEM 241	Organic Chemistry I (CCP= CHEM 221 [5])	4.0
MATH 200	Multivariate Calculus (CCP= MATH 271 [4])	4.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (CCP= PHY 241 [5])	8.0
	Term Credits	16.0

Spring

At Community College

MATH 210	Differential Equations (CCP = MATH 272 [4])	4.0
CS 190	Selected Computer Language (CCP= CSCI 111 [4])	3.0
Sub for ENGR 131 (Non EE & CE majors)		
General Education Elective (CCP= Social Science Elective [3])		4.5
CHEM 242 & CHEM 243	Organic Chemistry II (CCP = CHEM 222 [5])	7.0
	Term Credits	18.5

Third Year

Fall

At Drexel

UNIV E101	The Drexel Experience	1.0
COOP 101	Career Management and Professional Development	0.0
CHE 211	Material and Energy Balances I	4.0
CHE 220	Computational Methods in Chemical Engineering I	3.0
ENGR 220	Fundamentals of Materials	4.0
General Education Elective		3.0
	Term Credits	15.0

Winter

At Drexel

CHE 212	Material and Energy Balances II	4.0
CIVC 101	Introduction to Civic Engagement	1.0
CHE 230	Chemical Engineering Thermodynamics I	4.0
BIO Elective (100, 101, 122, 141)		4.0-4.5
General Education Elective		3.0
	Term Credits	16.0-16.5

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fourth Year

Fall

At Drexel

CHEM 356	Physical Chemistry Laboratory	2.0
CHE 330	Chemical Engineering Thermodynamics II	4.0
CHE 350	Statistics and Design of Experiments	3.0
CHE 341	Fluid Mechanics	4.0

	General Education Elective	3.0
	Term Credits	16.0
Winter		
At Drexel		
CHE 342	Heat Transfer	4.0
CHE 320	Computational Methods in Chemical Engineering II	3.0
CHE 351	Chemical Engineering Laboratory I	2.5
CHE 343	Mass Transfer	4.0
	General Education Elective	3.0
	Term Credits	16.5
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
CHE 471	Process Design I	4.0
CHE 464	Process Dynamics and Control	3.0
CHE 453	Chemical Engineering Laboratory III	2.5
CHE 362	Chemical Kinetics and Reactor Design	4.0
CHE 331	Separation Processes	3.0
	Term Credits	16.5
Winter		
At Drexel		
CHE 472	Process Design II	3.0
CHE 352	Chemical Engineering Laboratory II	2.5
CHE 371	Engineering Economics and Professional Practice	3.0
CHE 372	Integrated Case Studies in Chemical Engineering	3.0
	Term Credits	11.5
Spring		
At Drexel		
CHE 473	Process Design III	3.0
CHE 466	Chemical Process Safety	3.0
CHEC 353	Physical Chemistry and Applications III	4.0
	Technical Elective	3.0
	Technical Elective	3.0
	Term Credits	16.0

Total Credit: 181.0-181.5

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Civil Engineering

Drexel Degree Name: B.S. Civil Engineering

Community College Degree Name: A.S. in Engineering Science

Sample Plan of Study - First & Second Year at Community College of Philadelphia

70 Credits at CCP transfers over as 78.5-79.5 Credits at Drexel

First Year		
Fall		**Credits**
At Community College		
CHEM 101	General Chemistry I (CCP= CHEM 121 [4])	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP= ENGL 101 [3]) English Composition I	3.0
MATH 121	Calculus I (CCP= MATH 171 [4])	4.0
ENGR 111	Introduction to Engineering Design & Data Analysis (CCP = ENGR 102 [3])	3.0
	Free Elective (CCP= CIS 103 [3])	4.5
	Term Credits	18.0
Spring		
At Community College		
MATH 122 & MATH 123	Calculus II (CCP= MATH 172 [4])	4.0
ENGR 113	First-Year Engineering Design (CCP = ENGR 202 [3])	3.0
PHYS 101	Fundamentals of Physics I (CCP= PHYS 140 [5])	4.0
MATH 201	Linear Algebra (CCP = MATH 270 [4])	4.0
(sub for ENGR 231)		
	Term Credits	15.0
Summer		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102 [3])	6.0
	Term Credits	6.0
Second Year		
Fall		
At Community College		
CHEM 102	General Chemistry II (CCP= CHEM 122 [4])	4.5
MATH 200	Multivariate Calculus (CCP= MATH 271 [4])	4.0
MEM 202	Statics (CCP= ENGR 221 [3])	3.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (CCP= PHY 241 [5])	8.0
	Term Credits	19.5
Spring		
At Community College		
CS 190 or ENGR 220	Selected Computer Language (CCP= CSCI 111 or ENGR 205 [4]) Fundamentals of Materials	3.0-4.0
MATH 210	Differential Equations (CCP = MATH 272 (4))	4.0
(sub for ENGR 232)		
MEM 238	Dynamics (CCP = ENGR 222 (4))	4.0
	General Education Elective (CCP= Humanities Elective [3])	4.5
	General Education Elective (CCP= Social Science Elective [3])	4.5
	Term Credits	20.0-21.0
Third Year		
Fall		
At Drexel		
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0

MEM 230	Mechanics of Materials I	4.0
ENGR 220 or 131	Fundamentals of Materials	3.0-4.0
	Introductory Programming for Engineers	
UNIV E101	The Drexel Experience	1.0
COOP 101	Career Management and Professional Development	0.0
General Education Elective		3.0
	Term Credits	14.0-15.0
Winter		
At Drexel		
CIVC 101	Introduction to Civic Engagement	1.0
CAEE 203	System Balances and Design in CAEE	3.0
CIVE 250	Construction Materials	4.0
ENGR 210	Introduction to Thermodynamics	3.0
BIO 141	Essential Biology	4.5
	Term Credits	15.5
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fourth Year		
Fall		
At Drexel		
CIVE 320	Introduction to Fluid Flow	3.0
ENVE 300	Introduction to Environmental Engineering	3.0
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
CAEE 361	Statistical Analysis of Engineering Systems	3.0
CIVE 302	Structural Analysis I	4.0
	Term Credits	17.0
Winter		
At Drexel		
CIVE 240 [WI]	Engineering Economic Analysis	3.0
CIVE 330	Hydraulics	4.0
CIVE 303	Structural Design I	3.0
CIVE 375	Structural Material Behavior	3.0
General Education Elective		3.0
	Term Credits	16.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
CAE 491 [WI]	Senior Design Project I	3.0
CIVE 312	Soil Mechanics I	4.0
CIVE 430	Hydrology	3.0
CIVE 477 [WI]	Seminar	2.0
Professional Elective		3.0
Professional Elective		3.0
	Term Credits	18.0
Winter		
At Drexel		
CAE 492 [WI]	Senior Design Project II	3.0

CIVE 315	Soil Mechanics II	4.0
CIVE 478 [WI]	Seminar	1.0
Professional Elective		3.0
Professional Elective		3.0
	Term Credits	14.0
Spring		
At Drexel		
CAE 493 [WI]	Senior Design Project III	3.0
Professional Elective		3.0
Professional Elective		3.0
General Education Elective		3.0
	Term Credits	12.0

Total Credit: 185.0-187.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BA in Communication

Drexel Degree: B.A. Communication - Open

Community College Degree: A.A in Communication Studies

Sample Plan of Study - First & Second Year at Community College of Philadelphia

61 Credits at CCP transfer over as 83 Credits at Drexel

Please contact the Department of Communication **(**https://drexel.edu/coas/academics/departments-centers/communication/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP=ENGL 101: English Composition I [3]) English Composition I	3.0
MATH 100	Fundamentals of Mathematics (CCP= FNMT 118 [3])	3.0
CS 161	Introduction to Computing (CCP= CIS 103 [3])	3.0
COM 210	Theory and Models of Communication (CCP= ENGL 114 [3])	3.0
COM T180	Special Topics in Communication Theory (CCP= ENGL 117 [3])	3.0
	Term Credits	15.0

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102 [3])	6.0
BIO 107 & BIO 108	Cells, Genetics & Physiology (CCP= Science Elective Lab [4])	4.0
COM 230	Techniques of Speaking (CCP= ENGL 115 [3])	3.0
COM 150	Mass Media and Society (CCP Fulfilled by ENGL 107 [3])	3.0
Communication Elective		3.0
	Term Credits	19.0

Second Year

Fall		
At Community College		
COM 345	Intercultural Communication (CCP= ENGL 118 [3])	3.0
SOC 101, PSY 101, or ANTH 101	Introduction to Sociology (CCP=SOC 101, PSYC 101 or ANTH 112 [3]) General Psychology I Introduction to Cultural Diversity	3.0
Transfer Humanities Elective (CCP= Humanities Elective [3])		3.0
Transfer Humanities Elective (CCP= Literature Elective [3])		3.0
Transfer Humanities Elective (CCP=Literature Elective [3])		3.0
	Term Credits	15.0

Spring		
At Community College		
Transfer Humanities/Social Science (CCP= Directed Elective [3])		3.0
Social Science Elective (CCP=Social Science course [3])		3.0
(CCP=General Elective [3])		
Free Elective (CCP=Directed Elective [3])		3.0
COM Elective (CCP=General Elective [3])		3.0
Excess Free Elective Credit		22.0
	Term Credits	34.0

Third Year

Fall		
At Drexel		
COM 101	Human Communication	3.0
Foreign Language		4.0
MATH		4.0
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
COM 160	Introduction to Journalism	3.0
	Term Credits	15.0

Winter		
At Drexel		
Science Elective		3.0
Communication Elective		3.0
Foreign Language		4.0
COM 240	New Technologies In Communication	3.0
COM 181	Public Relations Principles and Theory	3.0
	Term Credits	16.0

Spring		
At Drexel		
CO-OP		
	Term Credits	0.0

Summer		
At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall		
At Drexel		
COM 220	Qualitative Research Methods	3.0
COM 310 [WI]	Technical Communication	3.0
LING 101	Introduction to Linguistics	0.0-3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Communication Elective		3.0
Foreign Language		4.0
	Term Credits	14.0-17.0

Winter		
At Drexel		
Foreign Language		4.0
PSY 101	General Psychology I	3.0
COM 221	Quantitative Research Methods in Communication	3.0
Communication Elective		3.0
Advanced COM Elective		3.0
	Term Credits	16.0

Spring		
At Drexel		
CO-OP		
	Term Credits	0.0

Summer		
At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall		
At Drexel		
Advanced COM Elective		3.0
COM 491	Senior Project in Communication I	3.0
PHIL 305	Ethics and the Media	3.0
Free Elective		3.0
COM 282 [WI]	Public Relations Writing	3.0
	Term Credits	15.0

Winter

At Drexel

Social Science Elective		3.0
COM 492	Senior Project in Communication II	3.0
International Studies Elective		3.0
Diversity Studies Elective		3.0
Free Elective		3.0
	Term Credits	15.0

Spring

At Drexel

Free Elective		3.0
COM 400	Seminar in Communication	3.0
Free Elective		3.0
Free Elective		3.0
	Term Credits	12.0

Total Credit: 186.0-189.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Computer Engineering

Drexel Degree Name: B.S. Computer Engineering

Community College Degree Name: A.S. in Engineering Science

Sample Plan of Study - First & Second Year at Community College of Philadelphia

71 Credits at CCP transfers over as 81 Credits at Drexel

Please contact the Department of Electrical and Computer Engineering **(**https://drexel.edu/engineering/academics/departments/electrical-computer-engineering/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
CHEM 101	General Chemistry I (CCP= CHEM 121 [4])	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP= ENGL 101 [3]) English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis (CCP= ENGR 102 [4])	3.0
MATH 121	Calculus I (CCP= MATH 171 [4])	4.0
Free Elective (CCP= CIS 103[3])		3.0
	Term Credits	16.5

Spring		
At Community College		
ENGR 113	First-Year Engineering Design (CCP= ENGR 202 [4])	3.0
MATH 122 & MATH 123	Calculus II (CCP= MAT 172 [4])	8.0
MATH 201 sub for ENGR 231	Linear Algebra (CCP= MATH 270 [4])	4.0
PHYS 101	Fundamentals of Physics I (CCP= PHYS 140 [5])	4.0
	Term Credits	19.0

Summer		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102 [3])	6.0
	Term Credits	6.0

Second Year

Fall		
At Community College		
CHEM 102	General Chemistry II (CCP= CHEM 122 [4])	4.5
MATH 200	Multivariate Calculus (CCP= MAT 271 [4])	4.0
MEM 202	Statics (CCP= ENGR 221 [3])	3.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (CCP= PHY 241 [5])	8.0
	Term Credits	19.5

Spring		
At Community College		
MEM 238	Dynamics (CCP= ENGR 222 [3])	4.0
General Education Elective (CCP= Humanities Elective [3])		4.5
ENGR 131	Introductory Programming for Engineers (CCP= CSCI 111 [4])	3.0

MATH 210^{sub for} ENGR 232	Differential Equations (CCP= MAT 272 [4])	4.0
General Education Elective (CCP= Social Science Elective [3])		4.5
	Term Credits	20.0

Third Year

Fall

At Drexel

ECE 105	Programming for Engineers II	3.0
ECE 200	Digital Logic Design	4.0
ECEC 201	Advanced Programming for Engineers	3.0
UNIV E101	The Drexel Experience	1.0
COM Elective		3.0
	Term Credits	14.0

Winter

At Drexel

CIVC 101	Introduction to Civic Engagement	1.0
ECE 201	Foundations of Electric Circuits I	4.0
ECEC 204	Design with Microcontrollers	3.0
MATH 221	Discrete Mathematics	3.0
Free Elective		3.0
	Term Credits	14.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fourth Year

Fall

At Drexel

ECE 301	Foundations of Electric Circuits II	4.0
ECE 361	Probability and Data Analytics for Engineers	4.0
ECEC 302	Digital Systems Projects	3.0
ECEC 357	Introduction to Computer Networks	3.0
	Term Credits	14.0

Winter

At Drexel

ECEC 355	Computer Organization & Architecture	3.0
ECES 301	Signals and Systems I	4.0
MATH 221	Discrete Mathematics	3.0
PHIL 315	Engineering Ethics	3.0
	Term Credits	13.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

CS 265	Advanced Programming Tools and Techniques	3.0
ECE 303	ECE Laboratory	3.0
ECE Electives		6.0
	Term Credits	12.0

Winter

At Drexel

CS 260	Data Structures	3.0
ECE 391	Introduction to Engineering Design Methods	1.0
ECE Elective		3.0
	Term Credits	7.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Sixth Year

Fall

At Drexel

ECE 491 [WI]	Senior Design Project I	2.0
ECEC 4XX Elective		3.0
ECE Elective		3.0
Gen Ed Elective		3.0
	Term Credits	11.0

Winter

At Drexel

ECE 492 [WI]	Senior Design Project II	2.0
ECEC 4XX Electivce		3.0
ECE Elective		3.0
Gen Ed Elective		3.0
	Term Credits	11.0

Spring

At Drexel

ECE 493	Senior Design Project III	4.0
ECEC 4XX Elective		3.0
ECE Elective		3.0
	Term Credits	10.0

Total Credit: 187.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Criminology and Justice Studies - Criminal Justice Concentration

Drexel Degree: B.S. Criminology and Justice Studies, Justice Concentration

Community College Degree: A.A.S in Criminal Justice

Sample Plan of Study - First & Second Year at Community College of Philadelphia

64 Credits at CCP transfers over as 90 Credits at Drexel

Please contact the Department of Criminology and Justice Studies **(**https://drexel.edu/coas/academics/departments-centers/criminology-justice-studies/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
CJS 101	Introduction to Criminal Justice (CCP= JUS 101 [3])	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP= ENGL 101 [3]) English Composition I	3.0
UNIV H101	The Drexel Experience (CCP= FYE 101 [3])	1.0
CIVC 101	Introduction to Civic Engagement (CCP= FYE 101 [3])	1.0
CJS 276	Introduction to Computer Crime (CCP= JUS 131 [3])	3.0
SOC 101	Introduction to Sociology (CCP= SOC 101 [3])	3.0
	Term Credits	14.0

Spring

At Community College		
PSY 101	General Psychology I (CCP= PSYC 101 [3])	3.0
BLAW 342	Criminal Law (CCP= JUS 241 [3])	4.0
CJS 360	Juvenile Justice (CCP= JUS 171 [3])	3.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102 [3])	6.0
MATH 100	Fundamentals of Mathematics (CCP= FNMT 118 [3])	3.0
	Term Credits	19.0

Second Year

Fall

At Community College

CJS T180	Special Topics in Criminology & Justice Studies (CCP= Concentration Course [3])	3.0
CJS T180	Special Topics in Criminology & Justice Studies (CCP= Concentration Course [3])	3.0
CJS T180	Special Topics in Criminology & Justice Studies (CCP= JUS 291 [3])	3.0
BIO 107 & BIO 108	Cells, Genetics & Physiology (CCP= BIOL 104 [4])	4.0
COM 230	Techniques of Speaking (CCP= ENGL 115 [3])	3.0
	Term Credits	16.0

Spring

At Community College		
CJS T180	Special Topics in Criminology & Justice Studies (CCP= JUS 291 [3])	3.0
PSCI 110	American Government (CCP= POLS 111 [3])	4.0
CJS T180	Special Topics in Criminology & Justice Studies (CCP= JUS Elect [3])	3.0
CJS T180	Special Topics in Criminology & Justice Studies (CCP= JUS Elect [3])	3.0
CJS 200	Criminology (CCP= SOC 215 [3])	3.0
Excess Free Elective Credit from Semester to Drexel Credits		25.0
	Term Credits	41.0

Third Year

Fall

At Drexel		
CJS 100	Freshman Seminar in Crime and Justice	3.0
CJS 210	Race, Crime, and Justice	3.0
CJS 250	Research Methods & Analytics I	3.0
Math Course		3.0-4.0
CJS Elective		3.0
	Term Credits	15.0-16.0

Winter

At Drexel		
CJS 266	Crime Prevention Planning	3.0
CJS 280	Communities and Crime	3.0
CJS 300	Research Methods and Analytics II	3.0
Science Course		3.0-4.0
	Term Credits	12.0-13.0

Spring

At Drexel		
ANTH 101	Introduction to Cultural Diversity	3.0
CJS 220	Crime and the City	3.0
PHIL 330	Criminal Justice Ethics	3.0
Free Elective		3.0
	Term Credits	12.0

Summer

At Drexel		
CJS 260	Justice in Our Community	4.0
Fine Arts Course		3.0
HIST Elective		4.0
CJS Elective		3.0
	Term Credits	14.0

Fourth Year

Fall

At Drexel		
PHIL 101	Introduction to Western Philosophy	3.0
CJS Elective		3.0
Free Elective		3.0
ENGL at the 200 level or higher		3.0
	Term Credits	12.0

Winter

At Drexel		
CJS 278	Introduction to Law Enforcement	3.0

CJS 376	Sentencing	3.0
CJS 261	Prison, Society and You	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Free Elective		3.0
	Term Credits	13.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

CJS 375	Criminal Procedure	3.0
CJS 290	Crime and Public Policy	3.0
Free Elective		3.0
Free Elective		3.0
	Term Credits	12.0

Total Credit: 180.0-182.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Culinary Arts and Science

Drexel Degree: B.S. Culinary Arts and Science

Community College Degree: A.A.S in Culinary Arts

Sample Plan of Study - First & Second Year at Community College of Philadelphia

65 Credits at CCP transfers over as 72 Credits at Drexel

*Note: This file is still pending updates. Students will need 185 credits to graduate with a B.S Degree

First Year

Fall		Credits
At Community College		
CULA 115	Culinary Fundamentals (CCP=CAHM 170 [4])	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP=ENGL 101 [3])	3.0
FDSC 100	ServSafe (CCP=CAHM 161 [2])	1.0
HRM 110	Introduction to the Hospitality Industry (CCP=CAHM 110 [3])	3.0
MATH 101	Introduction to Analysis I (CCP=FNMT 118 [3])	4.0
	Term Credits	14.0

Spring		
At Community College		
CULA 125 & CULA 220	Foundations of Professional Baking (CCP= CAHM 151 [4])	6.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102 [3])	6.0
HRM 215 & CULA 220	Commercial Food Production (CCP= CAHM 171 [4])	7.0
INFO 101	Introduction to Computing and Security Technology (CCP= CIS 103 [3])	3.0
NFS 100 & NFS 101	Nutrition, Foods, and Health (CCP= DIET 106 [3])	3.0
	Term Credits	25.0

Summer		
At Community College		
CULA 290	Culinary Arts Practicum I (CCP= CAHM 198 [400 Hours] [3])	3.0
	Term Credits	3.0

Second Year

Fall		
At Community College		
HRM 150	Food & Beverage Customer Service (CCP= CAHM 185 [3])	3.0
CULA 303	Global Cuisine Studio (CCP= CAHM 210 [4])	3.0
Social Science Elective (CCP= Social Science Elective [3])		3.0
Arts & Humanities Elective; CCP = Humanities Elective [3]		3.0
HRM 350	Cost Controls in Hospitality (CCP=CAHM 271 [3])	3.0
	Term Credits	15.0

Spring		
At Community College		
CHEM 201	Why Things Work: Everyday Chemistry (CCP= Social Science Elective [3/4]	3.0
CULA 120 & CULA 121	Techniques and Traditions I (CCP= CAHM 270 [4])	6.0
CULA 303	Global Cuisine Studio (CCP= CAHM 211 [4])	3.0

HRM 455	Hospitality Human Resources Management (CCP= CAHM 280 [3])	3.0
	Term Credits	15.0
Third Year		
Fall		
At Drexel		
CULA 235	Professional Dining Room Management	3.0
FDSC 154	Science of Food and Cooking	4.0
HRM 120	Principles of Food-Service Management	3.0
HRM 160	Laws of the Hospitality Industry	3.0
	Term Credits	13.0
Winter		
At Drexel		
CULA 320	Advanced Culinary Studio	3.0
CULA 325	Garde Manger Laboratory	3.0
FDSC 270	Microbial Food Safety and Sanitation	4.0
MINOR		4.0
	Term Credits	14.0
Spring		
At Drexel		
CULA 216	A la Carte	3.0
FDSC 120	Food and the Senses	3.0
MINOR		4.0
MINOR		4.0
	Term Credits	14.0
Summer		
At Drexel		
MINOR		4.0
MINOR		4.0
Arts and Humanities		3.0
Social Science		3.0
	Term Credits	14.0
Fourth Year		
Fall		
At Drexel		
CULA 316	Butchery Laboratory	2.0
CULA 405 [WI]	Culture and Gastronomy I	3.0
CULA 421	Senior Design Project I	2.0
FDSC 350	Experimental Foods: Product Development	3.0
HRM 220	Purchasing for the Hospitality Industry	3.0
	Term Credits	13.0
Winter		
At Drexel		
CULA 400	Directed Studies with a Master Chef	3.0
CULA 422	Senior Design Project II	2.0
FDSC 401	Modernist Cuisine	3.0
HRM 330	Hospitality Marketing and Branding	3.0
HRM 335	Beverage Management	3.0
	Term Credits	14.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
CULA 423	Senior Design Project III	2.0
CULA 440	Food in the Arts	3.0

HRM 435	Wine Regions of the World	3.0
MINOR		4.0
	Term Credits	12.0

Total Credit: 166.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Electrical Engineering

Drexel Degree Name: B.S. Electrical Engineering

Community College Degree Name: A.S. in Engineering Science

Sample Plan of Study - First & Second Year at Community College of Philadelphia

67 Credits at CCP transfers over as 82 credits at Drexel

Please contact the Department of Electrical and Computer Engineering **(**https://drexel.edu/engineering/academics/departments/electrical-computer-engineering/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
CHEM 101	General Chemistry I (CCP= CHEM 121 [4])	3.5
ENGR 111	Introduction to Engineering Design & Data Analysis (CCP= ENGR 102 [4])	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP= ENGL 101 [3])	3.0
MATH 121	Calculus I (CCP= MATH 171 [4])	4.0
Free Elective (CCP= CIS 103 [3])		3.0
	Term Credits	16.5

Spring

At Community College		
ENGR 113	First-Year Engineering Design (CCP= ENGR 202 [4]))	3.0
MATH 122 & MATH 123	Calculus II (CCP= MATH 172 [4])	8.0
MATH 201	Linear Algebra (CCP= MATH 270[3])	4.0
PHYS 101	Fundamentals of Physics I (CCP= PHYS 140 [5])	4.0
	Term Credits	19.0

Summer

At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102 [3])	6.0
	Term Credits	6.0

Second Year

Fall

At Community College		
CHEM 102	General Chemistry II (CCP= CHEM 122[4])	4.5
MATH 200	Multivariate Calculus (CCP= MAT 271 [4])	4.0
MEM 202	Statics (CCP= ENGR 221 [3])	3.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (CCP= PHY 241 [5])	8.0
	Term Credits	19.5

Spring

At Community College		
ENGR 220	Fundamentals of Materials (CCP= ENGR 205 [4])	4.0
MATH 210	Differential Equations (CCP= MAT 271 [4])	4.0
MEM 238	Dynamics (CCP= ENGR 222 [3])	4.0
General Education Elective (CCP= Humanities Elective [3])		4.5
General Education Elective (CCP= Social Science Elective [3])		4.5
	Term Credits	21.0

Third Year

Fall

At Drexel		
COOP 101	Career Management and Professional Development	0.0
ECE 105	Programming for Engineers II	3.0
ECE 200	Digital Logic Design	4.0
ECE 201	Foundations of Electric Circuits I	4.0
ENGR 220	Fundamentals of Materials	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	16.0

Winter

At Drexel		
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 131	Introductory Programming for Engineers	3.0
Sophomore Engr Elec		3.0
Free Elective		3.0
COM Elective		3.0
	Term Credits	13.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
ECE 301	Foundations of Electric Circuits II	4.0
ECE 361	Probability and Data Analytics for Engineers	4.0
ECES 301	Signals and Systems I	4.0
ECE Electives		6.0
	Term Credits	18.0

Winter

At Drexel		
ECE 391	Introduction to Engineering Design Methods	1.0
ECES 303	Signals and Systems II	3.0
ECE Electives		12.0
	Term Credits	16.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel		
ECE 491 [WI]	Senior Design Project I	2.0
ECE 303	ECE Laboratory	3.0
ECE Electives		9.0
General Education Elective		3.0
	Term Credits	17.0

Winter

At Drexel		
ECE 492 [WI]	Senior Design Project II	2.0
ECE Elective		9.0

| General Education Elective | | 3.0 |
| | Term Credits | 14.0 |

Spring

At Drexel

ECE 493	Senior Design Project III	4.0
ECE Elective		3.0
ECEP/S/E 4XX Elective		4.0
	Term Credits	11.0

Total Credit: 187.0

Writing-Intensive Course Requirements

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A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Elementary Education/PK-4 Certification

Drexel Degree Name: B.S. Elementary Education/PK-4 Certification

Community College Degree Name: A.A in Education: Early Childhood

Sample Plan of Study - First & Second Year at Community College of Philadelphia

61 Credits at CCP transfer over as 84 Credits at Drexel

Please contact the School of Education **(**https://drexel.edu/soe/academics/undergraduate/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP= ENGL 101 [3])	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective (CCP= ED 105 [3])	3.0
INFO 108	Foundations of Software (Free Elective (CCP= CIS 103 [3])	3.0
MATH 171 & MATH 172	Introduction to Analysis A ((CCP= MATH 151 [3])	6.0
PSY 101	General Psychology I (CCP= PSYC 101 [3])	3.0
	Term Credits	18.0

Spring

At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102 [3])	6.0
EDUC 335	Engaging the Learner (CCP=ED 204 [3])	3.0
EDUC 411	Family and Community Partnerships (CCP=ED 135 [3])	3.0
MATH 173	Introduction to Analysis C (CCP=MATH 152 [3])	3.0
PSY 320 & PSY 330 [WI]	Educational Psychology (CCP= PSYC 201 [3])	6.0
	Term Credits	21.0

Second Year

Fall		
At Community College		
BIO 100 & BIO 101	Applied Cells, Genetics & Physiology (CCP=BIO 104 Lab Science Elective [4])	6.0
EDUC 120	Child Development I: Typical Development (CCP= ED 250 [3])	3.0
EDUC 210 & EDUC 236	Early Language Development (CCP=ED 222 [3])	6.0
EDUC 306	Assessment of Young Children I (CCP= ED 245 [3])	3.0
EDUC 338	Expressive Arts for PK-4 (CCP= ED 230 [3])	3.0
	Term Credits	21.0

Spring

At Community College		
EDEX 142	Special Education Foundations: Referral and Assessment (CCP= ED 265 [3])	3.0
EDUC 365	Foundations in Instructing English Language Learners (CCP= ED 255 [3])	3.0
EDUC 409	Student Teaching Seminar I (CCP= ED 290 [3])	9.0
HIST 275	History of Pennsylvania (CCP= HIST 101, 102 or 103 [3])	3.0

NFS 100 & NFS 101	Nutrition, Foods, and Health (CCP=ED 151 Directed Elective [3])	3.0
	Term Credits	21.0

Third Year
Fall

At Drexel

CHEM 111	General Chemistry I	4.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
ENGL 200-239: English Lit Elective		3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 121	Child Development II: Atypical Development	3.0
	Term Credits	15.0

Winter

At Drexel

ECON 201	Principles of Microeconomics	4.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 314	Science Teaching Methods	3.0
MTED 417	Mathematics Methods and Content: Early Childhood	3.0
	Term Credits	14.0

Spring

At Drexel

EDEX 346	Literacy and Content Skill Development PreK-8	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 308	Creating a Positive Classroom Climate	3.0
Free Elective		4.0
	Term Credits	12.0

Summer

At Drexel

EDLT 325	Design for Learning with Digital Media	3.0
EDUC 355	Social Studies Teaching Methods	3.0
MTED 418	Mathematics Methods and Content	3.0
MUSC 130	Introduction to Music	3.0
Free Elective		3.0
	Term Credits	15.0

Fourth Year
Fall

At Drexel

EDUC 316	Teaching in Urban Contexts	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 336	Early Literacy II	3.0
PHYS 151	Applied Physics	3.0
Free Elective		3.0
	Term Credits	15.0

Winter

At Drexel

EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 410 [WI]	Student Teaching	9.0
	Term Credits	12.0

Spring

At Drexel

COM 111	Principles of Communication	3.0
EDUC 326 [WI]	Language Arts Processes	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
ENVS 260	Environmental Science and Society	3.0
SOC 335	Sociology of Education	3.0

Free Elective	3.0
Term Credits	16.0

Total Credit: 180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Elementary Education/ PK-4 Certification [T.E.A.C.H. Subarticulation]

Drexel Degree Name: B.S in Elementary Education/PK-4 Certification [PA T.E.A.C.H. Subarticulation]

Community College Degree Name: A.A in Early Childhood Education

Sample Plan of Study - First & Second Year at Community College of Philadelphia

Please contact the School of Education **(**https://drexel.edu/soe/academics/undergraduate/**)for the most current Plan of Study.**

First Year

Fall

At Community College

		Credits
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP= ENGL 101 [3])	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective (CCP= ED 105 [3])	3.0
INFO 108	Foundations of Software (CCP= CIS 103 [3])	3.0
MATH 171 & MATH 172	Introduction to Analysis A (CCP= MATH 151 [3])	6.0
PSY 101	General Psychology I (CCP= PSYC 101 [3])	3.0
	Term Credits	18.0

Spring

At Community College

EDUC 335	Engaging the Learner (CCP= ED 204 [3])	3.0
EDUC 411	Family and Community Partnerships	3.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102[3])	6.0
	CCP=ED 135 [3])	
MATH 173	Introduction to Analysis C (CCP= MATH 152 [3])	3.0
PSY 320 & PSY 330 [WI]	Educational Psychology (CCP= PSYC 201 [3])	6.0
Excess Free Elective Credit		2.0
	Term Credits	23.0

Second Year

Fall

At Community College

BIO 100 & BIO 101	Applied Cells, Genetics & Physiology (CCP= BIO 104 Lab Science Elective [4])	6.0
EDUC 120	Child Development I: Typical Development (CCP= ED 250 [3])	3.0
EDUC 210 & EDUC 236	Early Language Development (CCP= ED 222 [3])	6.0
EDUC 306	Assessment of Young Children I (CCP= ED 245 [3])	3.0
EDUC 338	Expressive Arts for PK-4 (CCP= ED 230 [3])	3.0
Excess Free Elective Credit		2.0
	Term Credits	23.0

Spring

At Community College

EDEX 142	Special Education Foundations: Referral and Assessment (CCP= ED 265 [4.5])	3.0
EDUC 365	Foundations in Instructing English Language Learners (CCP= ED 255 [3])	3.0
EDUC 409	Student Teaching Seminar I (CCP= ED 290 [3])	9.0
HIST 275	History of Pennsylvania (CCP= HIST 101, 102 or 103 [3])	3.0
NFS 100 & NFS 101	Nutrition, Foods, and Health (CCP= ED 151 Directed Elective [3])	3.0
	Term Credits	21.0

Third Year

Fall

At Drexel

CHEM 111	General Chemistry I	4.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
ENGL 200-239 English Lit Elective		
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 121	Child Development II: Atypical Development	3.0
	Term Credits	12.0

Winter

At Drexel

ECON 201	Principles of Microeconomics	4.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 314	Science Teaching Methods	3.0
MTED 417	Mathematics Methods and Content: Early Childhood	3.0
	Term Credits	14.0

Spring

At Drexel

EDEX 346	Literacy and Content Skill Development PreK-8	3.0
EDUC 105	Freshman Pedagogy Seminar	1.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 308	Creating a Positive Classroom Climate	3.0
Free Elective		3.0
	Term Credits	11.0

Summer

At Drexel

EDLT 325	Design for Learning with Digital Media	3.0
EDUC 355	Social Studies Teaching Methods	3.0
MTED 418	Mathematics Methods and Content	3.0
MUSC 130	Introduction to Music	3.0
Free Elective		3.0
	Term Credits	15.0

Fourth Year

Fall

At Drexel

EDUC 316	Teaching in Urban Contexts	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
EDUC 336	Early Literacy II	3.0
PHYS 151	Applied Physics	3.0
Free Elective		3.0
	Term Credits	15.0

Winter

At Drexel

EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 410 [WI]	Student Teaching	9.0
	Term Credits	12.0

Spring

At Drexel

COM 111	Principles of Communication	3.0
EDUC 326 [WI]	Language Arts Processes	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
ENVS 260	Environmental Science and Society	3.0

SOC 335	Sociology of Education	3.0
Free Elective		3.0
	Term Credits	16.0

Total Credit: 180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BA in English

Drexel Degree: B.A. English

Community College Degree: A.A in English

Sample Plan of Study - First & Second Year at Community College of Philadelphia

61 Credits at CCP transfer over as 90 Credits at Drexel

Please contact the Department of English & Philosophy **(**https://drexel.edu/coas/academics/departments-centers/english-philosophy/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP= ENGL 101 [3]) English Composition I	3.0
MATH 100	Fundamentals of Mathematics (CCP= FNMT 118 [3])	3.0
CS 161	Introduction to Computing (CCP= CIS 101 [3])	3.0
Transfer Social Science Elective (CCP= Social Science Elective [3])		3.0
Special Topics in Literature (CCP= ENGL 190 [3])		3.0
	Term Credits	15.0

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102 [3])	6.0
ENGL 211 [WI] or 212	British Literature I (CCP= ENGL 211 or 212 [3]) British Literature II	3.0
ENGL 205 [WI] or 206 [WI]	American Literature I (CCP= ENGL 221 or 222 [3]) American Literature II	3.0
BIO 107 & BIO 108	Cells, Genetics & Physiology (CCP= Laboratory Science [4])	4.0
Transfer Humanities Elective (CCP= Humanities Elective [3])		3.0
	Term Credits	19.0

Second Year

Fall		
At Community College		
ENGL 325	Topics in World Literature (CCP= ENGL 245 [3])	3.0
ENGL 211 [WI] , 212, 205 [WI] , or 206 [WI]	British Literature I (CCP= Literature Survey Elective [3]) British Literature II American Literature I American Literature II	3.0
General Education Elective (CCP= General Elective [3])		3.0
Transfer Humanities Elective (CCP= Humanities Elective [3])		3.0
COM 230	Techniques of Speaking (CCP= ENGL 115 [3])	3.0
	Term Credits	15.0

Spring		
At Community College		
English Elective (CCP= English Elective: Choose Two [6])		6.0
Transfer Humanities Elective (CCP= Transfer Humanities Elective [3])		3.0
Transfer Social Science Elective (CCP= Social Science Elective [3])		3.0
General Education Elective (CCP= General Elective [3])		3.0
Excess free elective credits from semester to Drexel credits		26.0
	Term Credits	41.0

Third Year

Fall	
At Drexel	
Mathematics Course	4.0
Foreign Language Course	4.0
English Elective 200-216	3.0
Science & Technology in the Humanities	3.0
Term Credits	14.0

Winter	
At Drexel	
Science Course	4.0
Foreign Language Course 201	4.0
English Elective 200-216	3.0
Creative & Professional Writing Course	3.0
Term Credits	14.0

Spring	
At Drexel	
CO-OP	
Term Credits	0.0

Summer	
At Drexel	
CO-OP	
Term Credits	0.0

Fourth Year

Fall	
At Drexel	
International Studies Elective	3.0
ENGL 490 Seminar in English and American Literature	3.0
Creative & Professional Writing Course	3.0
English Elective 305-381	3.0
Term Credits	12.0

Winter	
At Drexel	
Diversity Studies Elective	3.0
ENGL 492 Seminar in World Literature	3.0
ENGL 380 Literary Theory	3.0
Science & Technology in the Humanities	3.0
Term Credits	12.0

Spring	
At Drexel	
CO-OP	
Term Credits	0.0

Summer	
At Drexel	
CO-OP	
Term Credits	0.0

Fifth Year

Fall	
At Drexel	
International Studies Elective	3.0
ENGL 315 [WI] Shakespeare	3.0
English Elective 305-381	3.0
Creative & Professional Writing Course	3.0
UNIV H201 Looking Forward: Academics and Careers	1.0
Term Credits	13.0

Winter	
At Drexel	
Diversity Studies Elective	3.0
Creative & Professional Writing Course	3.0
English Elective 200-216	3.0
Science & Technology in the Humanities	3.0

English Elective 305-381		3.0
	Term Credits	15.0

Spring

At Drexel

Creative & Professional Writing Course		3.0
ENGL 495	Senior Project in Literature	3.0
Science & Technology in the Humanities		3.0
English Elective 320-335		3.0
	Term Credits	12.0

Total Credit: 182.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BA in Entrepreneurship and Innovation

Drexel Degree: B.A. Entrepreneurship and Innovation

Community College Degree: A.A. in Liberal Arts

Sample Plan of Study - First & Second Year at Community College of Philadelphia

63 Credits at CCP transfer over as 81-82 Credits at Drexel

Please contact the Close School of Entrepreneurship **(**https://drexel.edu/close/academics/undergraduate/BA-entrepreneurship-innovation/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ECON 201	Principles of Microeconomics (CCP= Social Science Elective = ECON 182 [3])	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP= ENGL 101 [3]) English Composition I	3.0
MATH 100	Fundamentals of Mathematics (CCP= MATH 121 prereq: FNMT 117 [3])	3.0
Technology Course (CCP= CIS 103 [3])		3.0
Any foreign language at 101 level or first-level computer language (CCP= CIS 106 [4]).		4.0
Excess free-elective credits		10.0
	Term Credits	27.0

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102 [3])	6.0
COM 230	Techniques of Speaking (CCP recommend ENGL 115 or 116; ENGL 116 preferred [3]))	3.0
Any foreign language at 102 level or second-level computer language (CCP = CIS 114 [4])		4.0
PHIL 105	Critical Reasoning (CCP= 1st in Humanities, recommended PHIL 111 [3])	3.0
MATH 101	Introduction to Analysis I (CCP = FMNT 118 or higher - recommended MATH 123 [3])	4.0
	Term Credits	20.0

Second Year

Fall		
At Community College		
Ethics (CCP= 2nd in Humanities Pair, recommend PHIL 211 [3])		3.0
Social/Behavioral (1st in social science pair; recommend CCP= PSYC 101 [3])		3.0
Any foreign language at 103 level or third-level computer language (CCP= CIS 228[4])		4.0
ACCT 120	Accounting Essentials for New Ventures (CCP= ENTR 130 [3])	4.0
Science Requirement (CCP 1nd Science Course, recommend any BIO, CHEM, GEO, PHYS, ENVS [3-4])		4.0
	Term Credits	18.0

Spring		
At Community College		
Humanities/Fine Arts (CCP= The Arts, recommend any ART or MUS courses [3])		6.0
BLAW 346	Entrepreneurial Law (CCP= ENTR 150 [4])	4.0

Social/Behavioral (CCP 2nd in social science pair; recommend CCP= PSYC 205 or PSYC 221 [3])		3.0
Science Requirement (CCP 2nd Science Course, recommend any BIO, CHEM, GEO, PHYS, ENVS [3-4])		3.0-4.0
	Term Credits	16.0-17.0
Third Year		
Fall		
At Drexel		
ENTP 100	Innovation Ecosystem	1.0
ENTP 105	Entrepreneurship Practice & Mindset	3.0
ENTP 250	Ideation	3.0
MKTG 201	Introduction to Marketing Management	4.0
Required Minor course		3.0
	Term Credits	14.0
Winter		
At Drexel		
CIVC 101	Introduction to Civic Engagement	1.0
ENTP 101	Life Strategies I	3.0
ENTP 205	Ready, Set, Fail	3.0
ENTP Elective course		3.0
Required Minor course		3.0
Concentration Requirement		3.0
	Term Credits	16.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fourth Year		
Fall		
At Drexel		
ENTP 225 [WI]	Mindfulness & Wellbeing	3.0
Free Elective		3.0
Required Minor courses		6.0
ENTP Elective course		3.0
Concentration Requirement		3.0
	Term Credits	18.0
Winter		
At Drexel		
Ethics		3.0
Humanities/Fine Arts elective (Choose from AFAS, ENGL, HUM, GST, JUDA, PHIL, WGST, or any course from the Westphal College of Media Arts and Design)		3.0
Concentration Requirement		3.0
Technology course		3.0
Required Minor course		3.0
	Term Credits	15.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
ENTP 410 [WI]	Thought Leadership	3.0

Required Minor course		3.0
Concentration Requirement		3.0
ENTP Elective course		3.0
Free Elective		3.0
	Term Credits	15.0
Winter		
At Drexel		
Free Electives		6.0
Required Minor course		3.0
Non-major Writing Intensive course		3.0
ENTP Elective course		3.0
	Term Credits	15.0
Spring		
At Drexel		
ENTP 215	Building Entrepreneurial Teams	3.0
Free Electives		6.0
ENTP Elective course		3.0
Required Minor course		3.0
	Term Credits	15.0

Total Credit: 189.0-190.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in General Studies

Drexel Degree Name: B.S. in General Studies

Community College Degree Name: A.A. in Liberal Arts

Sample Plan of Study - First & Second Year at Community College of Philadelphia

60 Credits at CCP transfer over as 90 Credits at Drexel

First Year

Fall

		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP= ENGL 101 [3]) English Composition I	3.0
MATH 100	Fundamentals of Mathematics (Fundamentals of Mathematics (CCP= FNMT 118 [3])	3.0
CS 161 or PRST 211	Introduction to Computing (Applied Computer Technology (CCP= CIS 103 [3]) Computer Applications for Professionals	3.0
Transfer Humanities Elective (CCP= Social Science Elective [3])		4.5
Transfer Free Elective (CCP= General Elective [3]		4.5
	Term Credits	18.0

Spring

At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102 [3])	6.0
COM 230	Techniques of Speaking (or Transfer Free Elective (CCP= Communication Course or ENGL 115 [5])	3.0-4.5
Transfer Humanities Elective (CCP= Social Science [3])		4.5
Transfer Humanities Elective (CCP= Humanities [3])		4.5
Transfer Science Elective (Science Course [3-4])		4.5-6.0
	Term Credits	22.5-25.5

Second Year

Fall

At Community College		
Transfer Humanities Elective (CCP=Social Science [3])		4.5
Transfer Humanities Elective (CCP= Humanities [3])		4.5
Transfer Science Elective (CCP= Science course [3-4])		4.5-6.0
Transfer Humanities Elective (CCP= Social Science or Humanities Elective [3])		4.5
Transfer Free Elective (CCP= General Elective [3])		4.5
	Term Credits	22.5-24.0

Spring

At Community College		
Transfer Humanities Elective (CCP= The Arts [3])		4.5
Transfer Free Elective (CCP= General Elective [3])		4.5
Transfer Free Elective (CCP= General Elective [3])		4.5
Transfer Free Elective (CCP= General Elective [3])		4.5
Transfer Free Elective (CCP= General Elective [3])		4.5
	Term Credits	22.5

Third Year

Fall

At Drexel		
COM 230	Techniques of Speaking	3.0
COOP 101	Career Management and Professional Development	0.0
GSTD 200	Lifelong Learning Theory & Practice	3.0
MATH 171	Introduction to Analysis A	3.0

Specialization Elective		3.0
Free Elective		4.0
	Term Credits	16.0

Winter

At Drexel		
GSTD 201 [WI]	Professional Applications of Emotional Intelligence	3.0
PRST 330	Career & Professional Development	3.0
Free Elective		4.0
Specialization Elective		3.0
Free Elective - Upper Elective		3.0
	Term Credits	16.0

Spring

At Drexel		
COOP EXPERIENCE		
	Term Credits	0.0

Summer

At Drexel		
COOP EXPERIENCE		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
GSTD 303	Client Relations Management	3.0
Specialization Electives		6.0
Free Elective [WI]		3.0
Specialization - Upper Level		3.0
	Term Credits	15.0

Winter

At Drexel		
PRST 303	Interpersonal Skills for Virtual Teams	3.0
Specialization Elective		3.0
Liberal Study - Upper Level		3.0
Free Elective - Upper Level		3.0
Specialization - Upper Level		3.0
	Term Credits	15.0

Spring

At Drexel		
COOP EXPERIENCE		
	Term Credits	0.0

Summer

At Drexel		
COOP EXPERIENCE		
	Term Credits	0.0

Fifth Year

Fall

At Drexel		
GSTD 491	Senior Project in General Studies	3.0
Specialization - Upper Level		3.0
Free Elective - Upper Level		3.0
Free Elective		4.0
Specialization Elective		3.0
	Term Credits	16.0

Winter

At Drexel		
Specialization - Upper Level		3.0
Free Elective [WI]		3.0
Specialization Elective		3.0
Free Elective - Upper Level		3.0
	Term Credits	12.0

Total Credit: 175.5-180.0

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

BS in Hospitality Management

Drexel Degree: B.S. Hospitality Management

Community College Degree: A.A.S in Hospitality Management

Sample Plan of Study - First & Second Year at Community College of Philadelphia

67 Credits at CCP transfers over as 90 Credits at Drexel

Please contact the Department of Food and Hospitality Management (https://drexel.edu/cnhp/academics/departments/food-hospitality-management/) for the most current Plan of Study.

First Year

Fall		Credits
At Community College		
HRM 110	Introduction to the Hospitality Industry (CCP= CAHM 110 [3])	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP= ENGL 101 [3])	3.0
MATH 181	Mathematical Analysis I (CCP= FNMT 118 [3])	0.0-3.0
CULA 115	Culinary Fundamentals (CCP= CAHM 170 [4])	3.0
	Term Credits	9.0-12.0
Spring		
At Community College		
INFO 101	Introduction to Computing and Security Technology (CCP= CIS 101 [3])	3.0
HRM 215	Commercial Food Production (CCP= CAHM 171 [4])	4.0
HRM 155	Hotel Customer Service (CCP= CAHM 120 [4])	3.0
ECON 202	Principles of Macroeconomics (CCP= ECON 181 [3])	4.0
Social Science Elective (CCP= Social Science Elective [3])		3.0
	Term Credits	17.0
Summer		
At Community College		
HRM 190	Industry Hours I (CCP= CAHM 198 [3])	1.0
Arts and Humanities Elective (CCP= Humanities Elective [3])		3.0
	Term Credits	4.0
Second Year		
Fall		
At Community College		
HRM 150	Food & Beverage Customer Service (CCP= CAHM 185 [3])	3.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102 [3])	6.0
HRM 160	Laws of the Hospitality Industry (CCP= CAHM 266 [3])	3.0
ACCT 110	Accounting for Professionals (CCP= ACCT 101 [4])	4.0
HRM 125	Hotel Operations Management (CCP= CAHM 130 [3])	3.0
	Term Credits	19.0
Spring		
At Community College		
Science Elective (CCP= Science Elective [3/4])		3.0
HRM 330	Hospitality Marketing and Branding (CCP= CAHM 278 [3])	3.0
HRM 350	Cost Controls in Hospitality (CCP= CAHM 271 [3])	3.0
HRM 120	Principles of Food-Service Management (CCP= CAHM 276 [3])	3.0
HRM 455	Hospitality Human Resources Management (CCP= CAHM 280 [3])	3.0
Drexel Excess Credits		26.0
	Term Credits	41.0
Third Year		
Fall		
At Drexel		
FDSC 100	ServSafe	1.0
HRM 130	Introduction to Tourism	3.0
Language		4.0
MATH 182	Mathematical Analysis II	3.0
COM 230	Techniques of Speaking	3.0
	Term Credits	14.0
Winter		
At Drexel		
HRM 131	Tourism Geography	3.0
Language		4.0
HRM 345	Convention Management	3.0
MATH 107	Probability and Statistics for Liberal Arts	3.0
HRM 290	Industry Hours II	1.0
	Term Credits	14.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel

Language		4.0
HRM 355	Resort Management	3.0
HRM 370	Gaming and Casino Management I	3.0
HRM 390	Industry Hours III	1.0
MKTG 201	Introduction to Marketing Management	4.0
	Term Credits	15.0

Winter

At Drexel

HRM 371	Gaming and Casino Management II	3.0
HRM 450	Hospitality Leadership Seminar	3.0
HRM 490	Industry Hours IV	1.0
COM 181	Public Relations Principles and Theory	3.0
MIS 200	Management Information Systems	4.0
	Term Credits	14.0

Spring

At Drexel

CO-OP		
	Term Credits	0.0

Summer

At Drexel

CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel

HRM 425	Hospitality Industry Administration	3.0
HRM 495	Industry Hours V	1.0
ECON 201	Principles of Microeconomics	4.0
Free Elective		3.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
	Term Credits	14.0

Winter

At Drexel

HRM 335	Beverage Management	3.0
COM 270 [WI]	Business Communication	3.0
Social Science		3.0
ORGB 300 [WI]	Organizational Behavior	4.0
Free Elective		2.0
	Term Credits	15.0

Total Credit: 176.0-179.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Mechanical Engineering

Drexel Degree Name: B.S. Mechanical Engineering

Community College Degree Name: A.S. in Engineering Science

Sample Plan of Study - First & Second Year at Community College of Philadelphia

65 Credits at CCP transfer over as 82.5 Credits at Drexel

Please contact the Department of Mechanical Engineering and Mechanics **(**https://drexel.edu/engineering/academics/departments/mechanical-engineering/**) for the most current Plan of Study.**

First Year

Fall | | **Credits**

At Community College

CHEM 101	General Chemistry I (CCP= CHEM 121 [4])	3.5
ENGR 111	Introduction to Engineering Design & Data Analysis (CCP= ENGR 102 [2])	3.0
MATH 121	Calculus I (CCP= MATH 171 [4])	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP= ENGL [3]) English Composition I	3.0
Free Elective (CCP= CIS 103 [3])		4.5
	Term Credits	18.0

Spring

At Community College

MATH 122 & MATH 123	Calculus II (CCP= MAT 172 [4])	8.0
ENGR 113	First-Year Engineering Design (CCP= ENGR 202 [4])	3.0
PHYS 101	Fundamentals of Physics I (CCP= PHYS 140 [5])	4.0
MATH 201	Linear Algebra (CCP= MATH 270 [4])	4.0
	Term Credits	19.0

Summer

At Community College

ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102 [3])	6.0
	Term Credits	6.0
Second Year		
Fall		
At Community College		
CHEM 102	General Chemistry II (CCP= CHEM 122 [4])	4.5
MATH 200	Multivariate Calculus (CCP= MAT 271 [4])	4.0
MEM 202	Statics (CCP= ENGR 221 [3])	3.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (CCP= PHY 241 [5])	8.0
	Term Credits	19.5
Spring		
At Community College		
MEM 238	Dynamics (CCP= ENGR 222 [3])	4.0
MATH 210	Differential Equations (CCP= MAT 272 [4])	4.0
CS 190 or ENGR 220	Selected Computer Language (CCP= CSCI 111 OR ENGR 205 [4]) Fundamentals of Materials	3.0
General Education Elective (CCP= Humanities Elective [3])		4.5
General Education Elective (CCP= Social Sci Elective [3])		4.5
	Term Credits	20.0
Third Year		
Fall		
At Drexel		
HIST 285	Technology in Historical Perspective	4.0
MEM 201	Foundations of Computer Aided Design	3.0
MEM 230	Mechanics of Materials I	4.0
UNIV E101	The Drexel Experience	1.0
ENGR 220	Fundamentals of Materials	4.0
	Term Credits	16.0
Winter		
At Drexel		
ENGR 210	Introduction to Thermodynamics	3.0
MEM 255	Introduction to Controls	4.0
MEM 220	Fluid Mechanics I	4.0
MEM 333	Mechanical Behavior of Materials	3.0
MEM 331	Experimental Mechanics I	2.0
	Term Credits	16.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fourth Year		
Fall		
At Drexel		
MEM 310	Thermodynamic Analysis I	4.0
MEM 345	Heat Transfer	4.0
MEM 255	Introduction to Controls	4.0
MEM 435	Introduction to Computer-Aided Design and Manufacturing	4.0
MEM 391	Introduction to Engineering Design Methods	1.0
	Term Credits	17.0
Winter		
At Drexel		
MEM 361	Engineering Reliability	3.0
MEM 311	Thermal Fluid Science Laboratory	2.0
MEM 351	Dynamic Systems Laboratory I	2.0

MEM Fundamental Electives		11.0
	Term Credits	18.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
MEM 491 [WI]	Senior Design Project I	2.0
MEM Fundamental Elective		3.0
MEM/CoE Elective		3.0
Math/Science Elective		3.0
PHIL 315	Engineering Ethics	3.0
	Term Credits	14.0
Winter		
At Drexel		
MEM 492 [WI]	Senior Design Project II	3.0
MEM Elective		3.0
MEM/CoE Elective		3.0
Math/Science Elective		3.0
General Education Elective		3.0
	Term Credits	15.0
Spring		
At Drexel		
MEM 493 [WI]	Senior Design Project III	3.0
BIO 141	Essential Biology	4.5
MEM Elective		3.0
	Term Credits	10.5

Total Credit: 189.0

Writing-Intensive Course Requirements

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Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Psychology

Drexel Degree Name: B.S. Psychology

Community College Degree Name: A.A in Psychology

Sample Plan of Study - First & Second Year at Community College of Philadelphia

62 Credits at CCP transfer over as 74 Credits at Drexel

Contact the Department of Psychology (https://drexel.edu/coas/academics/departments-centers/psychology/) for the most current Plan of Study.

First Year

Fall

		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (CCP= ENGL 101 [3]) English Composition I	3.0
MATH 101	Introduction to Analysis I (CCP= MATH 151 [3])	4.0
CS 161	Introduction to Computing (CCP= CIS 103 [3])	3.0
PSY 101	General Psychology I (CCP= PSYC 101 [3])	3.0
SOC 101	Introduction to Sociology (CCP= SOC 101 [3])	3.0
	Term Credits	16.0

Spring

At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (CCP= ENGL 102 [3])	6.0
PSY 240 [WI]	Abnormal Psychology (CCP= PSYC 205 [3])	3.0
Free Elective (CCP= Language Requirement [3])		4.0
PSY Elective (CCP= PSYC 110 [3])		3.0
BIO 107 & BIO 108	Cells, Genetics & Physiology (CCP= BIOL 106 [4])	4.0
	Term Credits	20.0

Second Year

Fall

At Community College		
PSY 120	Developmental Psychology (CCP= PSYC 215 [3])	3.0
Free Elective (CCP= Humanities Elective [3])		3.0
Free Elective (Language Requirement II [3])		4.0
PSY Elective (CCP=PSYC167 [3])		3.0

BIO 109 & BIO 110	Biological Diversity, Ecology & Evolution (CCP= BIOL 107 [4])	4.0
	Term Credits	17.0

Spring

At Community College		
PSY Elective (CCP= Psychology Elective [3])		3.0
ANTH 101	Introduction to Cultural Diversity (CCP= ANTH 112 [3])	3.0
PSY Elective (CCP= PSYC 210 [3])		3.0
Free Elective (CCP= Language Requirement [3])		4.0
PHIL Elective (CCP=*Take PHIL 151 [3])		3.0
Excess Free Elective Credit from Semester to Drexel Credits		21.0
	Term Credits	37.0

Third Year

Fall

At Drexel		
PSY 264	Computer-Assisted Data Analysis I	3.0
PSY 290	History and Systems of Psychology	3.0
COOP 101	Career Management and Professional Development	0.0
HIST Elective		4.0
English Lit Elective		3.0
Free Elective		2.0
	Term Credits	15.0

Winter

At Drexel		
PSY 265	Computer-Assisted Data Analysis II	3.0
PSY 330	Cognitive Psychology	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
CIVC 101	Introduction to Civic Engagement	1.0
Business Elective		4.0
Free Elective		3.0
	Term Credits	15.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
PSY 360 [WI]	Experimental Psychology	3.0
PSY 325	Psychology of Learning	3.0
PSY 140	Approaches to Personality	3.0
MATH 102	Introduction to Analysis II	4.0
Free Elective		3.0
	Term Credits	16.0

Winter

At Drexel		
PSY 280	Psychological Research I	3.0
PSY 212	Physiological Psychology	3.0
PSY 150	Introduction to Social Psychology	3.0
COM 230	Techniques of Speaking	3.0
HIST Elective		4.0
	Term Credits	16.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

	At Drexel	
	CO-OP	
	Term Credits	0.0
Fifth Year		
Fall		
	At Drexel	
PSY 380	Psychological Testing and Assessment	3.0
PSY Elective		3.0
PSY Elective		3.0
Fine Arts Elective		3.0
Free Elective		3.0
	Term Credits	15.0
Winter		
	At Drexel	
PSY Elective		3.0
PSY Elective		3.0
English Lit Elective		3.0
PSCI Elective		4.0
	Term Credits	13.0

Total Credit: 180.0

Writing-Intensive Course Requirements

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Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

Delaware County Community College

Degree Programs in the Close School of Entrepreneurship

Degree Programs in the College of Arts and Sciences

Degree Programs in the College of Business

Degree Programs in the College of Engineering

Degree Programs in the College of Nursing and Health Professions

Degree Programs in the Goodwin College of Professional Studies

Degree Programs in the School of Education

BS in Architectural Engineering, Mechanical Concentration

Drexel Degree Name: B.S. Architectural Engineering, Mechanical Concentration

Community College Degree Name: A.S in Engineering

Sample Plan of Study - First & Second Year at Delaware County Community College

62 Credits at DCCC transfers over as 76 Credits at Drexel

Please contact the Department of Civil, Architectural and Environmental Engineering **(**https://drexel.edu/engineering/academics/departments/civil-architectural-environmental-engineering/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3])	3.0
MATH 121	Calculus I (DCCC= MAT 160 [4])	4.0
CHEM 101	General Chemistry I (DCCC= CHE 110 [3])	3.5
Free Elective (DCCC= EGR 150 [1])		1.5
CS 190	Selected Computer Language (DCCC= DPR 101 [3])	3.0
	Term Credits	15.0

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
MATH 122	Calculus II (DCCC= MAT 161 [4])	4.0
CHEM 102	General Chemistry II (DCCC= CHE 111 [4])	4.5
PHYS 101	Fundamentals of Physics I (DCCC= PHY 131 [4])	4.0
	Term Credits	18.5

Second Year

Fall		
At Community College		
PHYS 102 & PHYS 201	Fundamentals of Physics II (DCCC= PHY 132 [4])	8.0
MATH 200	Multivariate Calculus (DCCC= MAT 260 [4])	4.0
General Education Elective (DCCC= Any transferable Diversity and Social Justice Social Science Course [3])		

General Education Elective (DCCC= Any transferable Global Understanding designated Social Science Course [3])		4.5
MEM 202	Statics (DCCC= EGR 200 [4])	3.0
	Term Credits	19.5

Spring

At Community College

MATH 210	Differential Equations (DCCC=MAT 261 [3])	4.0
COM T180	Special Topics in Communication Theory (DCCC= COM 100 or COM 111 [3])	3.0
General Education Elective (DCCC= Humanities Elective [3])		4.5
ENGR 210	Introduction to Thermodynamics (DCCC= EGR 220[3])	3.0
	Term Credits	14.5

Summer

At Community College

MATH 201	Linear Algebra (DCCC= MAT 200 [3])	4.0
	Term Credits	4.0

Third Year

Fall

At Drexel

ENGR 113	First-Year Engineering Design	3.0
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
UNIV E101	The Drexel Experience	1.0
COOP 101	Career Management and Professional Development	0.0
ENGR 220	Fundamentals of Materials	4.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
	Term Credits	14.0

Winter

At Drexel

CAEE 203	System Balances and Design in CAEE	3.0
ARCH 191	Studio 1-AE	3.0
CIVE 240 [WI]	Engineering Economic Analysis	3.0
ENGR 210	Introduction to Thermodynamics	3.0
	Term Credits	12.0

Spring

At Drexel

COOP

	Term Credits	0.0

Summer

At Drexel

COOP

	Term Credits	0.0

Fourth Year

Fall

At Drexel

AE 340	Architectural Illumination and Electrical Systems	3.0
ARCH 141	Architecture and Society I	3.0
ARCH 192	Studio 2-AE	3.0
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
CIVE 320	Introduction to Fluid Flow	3.0
	Term Credits	16.0

Winter

At Drexel

AE 220	Introduction to HVAC	3.5
ARCH 142	Architecture and Society II	3.0
CIVE 250	Construction Materials	4.0
MEM 230	Mechanics of Materials I	0.0-4.0
CIVE 330	Hydraulics	4.0
	Term Credits	14.5-18.5

Spring

At Drexel

COOP

	Term Credits	0.0

Summer

At Drexel

COOP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

AE 390	Architectural Engineering Design I	4.0
ARCH 143	Architecture and Society III	3.0
MEM 345	Heat Transfer	4.0
CIVE 302	Structural Analysis I	4.0
	Term Credits	15.0

Winter

At Drexel

AE 391	Architectural Engineering Design II	4.0
CIVE 303	Structural Design I	3.0
PROF ELEC		3.0
	Term Credits	10.0

Spring

At Drexel

COOP

	Term Credits	0.0

Summer

At Drexel

COOP

	Term Credits	0.0

Sixth Year

Fall

At Drexel

AE 544	Building Envelope Systems	3.0
CAE 491 [WI]	Senior Design Project I	3.0
CAEE 361	Statistical Analysis of Engineering Systems	3.0
MEM 413	HVAC Loads	3.0
	Term Credits	12.0

Winter

At Drexel

CAE 492 [WI]	Senior Design Project II	3.0
MEM 414	HVAC Equipment	3.0
PROF ELEC		3.0
	Term Credits	9.0

Spring

At Drexel

CAE 493 [WI]	Senior Design Project III	3.0
AE 430	Control Systems for HVAC	3.0
PROF ELEC		3.0
	Term Credits	9.0

Total Credit: 183.0-187.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Architectural Engineering - Structural Engineering

Drexel Degree Name: B.S. Architectural Engineering, Structural Concentration

Community College Degree Name: A.S in Engineering

Sample Plan of Study - First & Second Year at Delaware County Community College

59 Credits at DCCC transfer over as 64 Credits at Drexel

Please contact the Department of Civil, Architectural and Environmental Engineering **(**https://drexel.edu/engineering/academics/departments/civil-architectural-environmental-engineering/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3])	3.0
MATH 121	Calculus I (DCCC=MAT 160[4])	4.0
CHEM 101	General Chemistry I (DCCC=CHE 110 [3])	3.5
Free Elective (DCCC=EGR 150 [1])		1.5
CS 190	Selected Computer Language (DCCC=DPR 101 [3])	3.0
	Term Credits	15.0

Spring

At Community College		

ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC=ENG 112 [3])	6.0
MATH 122	Calculus II (DCCC=MAT 161 [4])	4.0
CHEM 102	General Chemistry II (DCCC=CHE 111 [4])	4.5
PHYS 101	Fundamentals of Physics I (DCCC=PHY 131 [4])	4.0
	Term Credits	18.5

Second Year

Fall

At Community College		
PHYS 102 & PHYS 201	Fundamentals of Physics II (DCCC=PHY 132 [4])	8.0
MATH 200	Multivariate Calculus (DCCC= MAT 260 [4])	4.0
General Education Elective (DCCC= Any transferable Diversity and Social Justice Social Science Course [3])		4.5
General Education Elective (DCCC=Any transferable Global Understanding designated Social Science Course [3])		
MEM 202	Statics (DCCC= EGR 200 [4])	3.0
	Term Credits	19.5

Spring

At Community College		
MATH 210	Differential Equations (DCCC= MAT 261 [3])	4.0
COM T180	Special Topics in Communication Theory (DCCC= COM 100 or COM 111 [3])	3.0
General Education Elective (DCCC=Humanities Elective [3])		
	Term Credits	7.0

Summer

At Community College		
MATH 201	Linear Algebra (DCCC=MAT 200 [3])	4.0
	Term Credits	4.0

Third Year

Fall

At Drexel		
ENGR 113	First-Year Engineering Design	3.0
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
UNIV E101	The Drexel Experience	0.0-2.0
COOP 101	Career Management and Professional Development	0.0
ENGR 220	Fundamentals of Materials	4.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0
	Term Credits	13.0-15.0

Winter

At Drexel		
CAEE 203	System Balances and Design in CAEE	3.0
ARCH 191	Studio 1-AE	3.0
CIVE 240 [WI]	Engineering Economic Analysis	3.0
ENGR 210	Introduction to Thermodynamics	3.0
	Term Credits	12.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
AE 340	Architectural Illumination and Electrical Systems	3.0
ARCH 141	Architecture and Society I	3.0
ARCH 192	Studio 2-AE	3.0
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0

CIVE 320	Introduction to Fluid Flow	3.0
	Term Credits	16.0
Winter		
At Drexel		
AE 220	Introduction to HVAC	3.5
ARCH 142	Architecture and Society II	3.0
CIVE 250	Construction Materials	4.0
MEM 230	Mechanics of Materials I	0.0-4.0
CIVE 330	Hydraulics	4.0
	Term Credits	14.5-18.5
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
AE 390	Architectural Engineering Design I	4.0
ARCH 143	Architecture and Society III	3.0
CIVE 302	Structural Analysis I	4.0
Professional Elective		3.0
CIVE 312	Soil Mechanics I	4.0
	Term Credits	18.0
Winter		
At Drexel		
AE 391	Architectural Engineering Design II	4.0
CIVE 303	Structural Design I	3.0
MEM 238	Dynamics	4.0
BIO 141	Essential Biology	4.5
	Term Credits	15.5
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Sixth Year		
Fall		
At Drexel		
AE 544	Building Envelope Systems	3.0
CAE 491 [WI]	Senior Design Project I	3.0
CAEE 361	Statistical Analysis of Engineering Systems	3.0
CIVE 400	First Principles of Structural Design	3.0
	Term Credits	12.0
Winter		
At Drexel		
CAE 492 [WI]	Senior Design Project II	3.0
Professional Elective		3.0
CIVE 401	Structural Design II	3.0
CIVE 315	Soil Mechanics II	4.0
	Term Credits	13.0
Spring		
At Drexel		
CAE 493 [WI]	Senior Design Project III	3.0

CIVE 402	Structural Design III	3.0
	Term Credits	6.0

Total Credit: 184.0-190.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Biological Science

Drexel Degree Name: B.S. Biological Science

Community College Degree Name: A.S in Mathematics/Natural Science

Sample Plan of Study - First & Second Year at Delaware County Community College

65 Credits at DCCC transfer over as 90 Credits at Drexel

Please contact the Department of Biology **(**https://drexel.edu/coas/academics/departments-centers/biology/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3])	3.0
INFO 101 or CS 161	Introduction to Computing and Security Technology (DCCC= DPR 100 or DPR 101 [3]) Introduction to Computing	3.0
BIO 122	Cells and Genetics (DCCC= *Take BIO 110 for Scientific Inquiry Elective[4])	4.5
Humanities and Social Sciences Elective (DCCC= Diversity and Social Justice designated Social Science course [3])		3.0
MATH 121	Calculus I (DCCC= *Take MAT 160 [4])	4.0
	Term Credits	17.5

Spring

At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
BIO 124 & BIO 126	Evolution & Organismal Diversity (DCCC= *Take BIO 111 [4] for Laboratory Science Elective [4])	9.0
MATH 122 & MATH 123	Calculus II (DCCC=*Take MAT 161 for Mathematics Elective [4])	8.0
Humanities and Social Science Elective(DCCC= Global Understanding Humanities Course [3])		3.0
Humanities and Social Science Elective (DCCC= Social Science Elective [3])		3.0
	Term Credits	29.0

Second Year

Fall

At Community College		
COM 230	Techniques of Speaking (DCCC= *Take COMM 111 [3])	3.0
CHEM 101	General Chemistry I (DCCC= *Take CHE 110 [4] for Math/Laboratory Science Elective [4])	3.5
PHYS 152	Introductory Physics I (DCCC= *Take PHY 131 [4] Math/Lab Science Elective [3-5])	4.0
PHIL 251	Ethics (DCCC= *Take PHI 110 [3] for Open Elective)	3.0
Free Elective (DCCC= Social Science Elective [3])		3.0
	Term Credits	16.5

Spring

At Community College		
CHEM 102 & CHEM 103	General Chemistry II (DCCC=*Take CHE 111 [4] for Mathematics/Laboratory Science Elective [3-4])	9.5
PHYS 153 & PHYS 154	Introductory Physics II (DCCC=*Take PHY 132 [4] for Mathematics/Laboratory Science Elective [3-5])	8.0

Free Electives (DCCC= Open Elective [6-8])		6.0
Excess free elective credits from semester to Drexel credits		3.5
	Term Credits	27.0

Third Year

Fall

At Drexel		
BIO 209	Cell, Molecular & Developmental Biology I	4.0
BIO 207	Applications in Biology I	1.0
CHEM 241	Organic Chemistry I	4.0
ENVS 212	Evolution	4.0
COOP 101	Career Management and Professional Development	0.0
UNIV S201	Looking Forward: Academics and Careers	1.0
	Term Credits	14.0

Winter

At Drexel		
BIO 211	Cell, Molecular & Developmental Biology II	4.0
BIO 208	Applications in Biology II	1.0
CHEM 242	Organic Chemistry II	4.0
BIO 219 [WI]	Techniques in Molecular Biology	3.0
CIVC 101	Introduction to Civic Engagement	1.0
Sci, Tech Hlth & Human Affairs Elective		3.0
	Term Credits	16.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
BIO Concentration Req		3.0
BIO 311	Biochemistry	4.0
Lab Requirement		2.0
BIO/ENVS Elective		3.0
COM 310 [WI]	Technical Communication	3.0
	Term Credits	15.0

Winter

At Drexel		
BIO Concentration Req		3.0
BIO 224	Form, Function & Evolution of Vertebrates	4.0
BIO 225	Vertebrate Biology and Evolution Laboratory	2.0
BIO/ENVS Elective		3.0
Free Elective		3.0
	Term Credits	15.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel		
BIO 471	Seminar in Biological Sciences	2.0
MATH 410	Scientific Data Analysis I	3.0
BIO Concentration Req		3.0

BIO/ENVS Elective		3.0
Free Elective		6.0
	Term Credits	17.0
Winter		
At Drexel		
BIO 472	Seminar in Biological Sciences	2.0
MATH 411	Scientific Data Analysis II	3.0
BIO Concentration Req		3.0
BIO/ENVS Elective		3.0
Free Elective		3.0
Lab Requirement		2.0
	Term Credits	16.0

Total Credit: 183.0

Writing-Intensive Course Requirements

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Transfer Credits
Transfer Credits

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BS in Business Administration - Major in Accounting

Drexel Degree Name: BSBA in Accounting

Community College Degree Name: A.S. in Business Administration

Sample Plan of Study - First & Second Year at Delaware Community College

62 Credits at DCCC Transfer as 86 Credits to Drexel

Please contact the Department of Accounting **(**https://www.lebow.drexel.edu/faculty-and-research/disciplines/accounting/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ACCT 115	Financial Accounting Foundations (DCCC= ACC 101 [3])	4.0
BUSN 111	Foundations for Business (DCCC= BUS 100 [3])	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
Science Elective (DCCC= DPR 100 [3])		3.0
Society and Culture (DCCC= Diversity and Social Justice Elective [3])		3.0
	Term Credits	17.0

Spring		
At Community College		
ACCT 116	Managerial Accounting Foundations (DCCC= ACC 112 [3])	4.0
ECON 202	Principles of Macroeconomics (DCCC= ECO 210 [3])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	3.0-6.0
MATH 101	Introduction to Analysis I (DCCC= MAT 135 [3])	4.0
MKTG 201	Introduction to Marketing Management (DCCC= BUS 230 [3])	4.0
	Term Credits	19.0-22.0

Second Year

Fall		
At Community College		
BLAW 201	Business Law I (DCCC= BUS 243 [3])	4.0
BIO 100	Applied Cells, Genetics & Physiology (DCCC= BIO 100 [4])	3.0
COM 270 [WI]	Business Communication (DCCC= BUS 130 [3])	3.0
ECON 201	Principles of Microeconomics (DCCC= ECO 220 [3])	4.0
Free Elective (DCCC= BUS 210 [3])		3.0
	Term Credits	17.0

Spring		
At Community College		
CHEM 151	Applied Chemistry (DCCC= CHEM 151 [3])	3.0
INTB 200	International Business (DCCC= BUS 101 [3])	4.0
MATH 102	Introduction to Analysis II (DCCC= MAT 136 [3])	4.0
PHIL 105	Critical Reasoning (DCCC= PHI 110 [3])	3.0
STAT 201	Introduction to Business Statistics (DCCC= STAT 201 [4])	4.0
Excess Free Elective Credit		15.0
	Term Credits	33.0

Third Year

Fall

At Drexel

ACCT 321	Financial Reporting I	4.0
COOP 101	Career Management and Professional Development	0.0
FIN 301	Introduction to Finance	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
English Literature Elective		3.0
	Term Credits	15.0

Winter

At Drexel

ACCT 322	Financial Reporting II	4.0
MIS 200	Management Information Systems	4.0
OPM 200	Operations Management	4.0
PSY 101	General Psychology I	3.0
UNIV B101	The Drexel Experience	1.0
	Term Credits	16.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fourth Year

Fall

At Drexel

ACCT 323	Financial Reporting III	4.0
CIVC 101	Introduction to Civic Engagement	1.0
STAT 202, MGMT 260, MGMT 451, MGMT 370, or MGMT 371	Business Statistics II Introduction to Entrepreneurship Management Simulation For-Profit Business Consulting Nonprofit Business Consulting	4.0
General Education Electives		6.0
	Term Credits	15.0

Winter

At Drexel

STAT 202, MGMT 260, MGMT 451, MGMT 370, or MGMT 371	Business Statistics II Introduction to Entrepreneurship Management Simulation For-Profit Business Consulting Nonprofit Business Consulting	4.0
TAX 341	Individual Income Taxes	4.0
General Education Elective		3.0
HIST Elective		4.0
	Term Credits	15.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

ACCT 331	Cost Accounting	4.0
TAX 342	Business Income Taxes	4.0
Social Science Elective		3.0
General Education Elective		3.0
	Term Credits	14.0

Winter

At Drexel

ACCT 329	Advanced Accounting	4.0
ACCT 341	Principles of Auditing	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
UNIV B201 [WI]	Career Management	1.0
Fine Arts Elective		3.0
	Term Credits	16.0

Total Credit: 177.0-180.0

Writing-Intensive Course Requirements

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Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Business Administration - Major in Finance

Drexel Degree Name: BSBA in Finance

Community College Degree Name: A.S. in Business Administration

Sample Plan of Study - First & Second Year at Delaware County Community College

63 Credits at DCCC Transfer as 86-89 Credits at Drexel

Please contact the Department of Finance **(**https://www.lebow.drexel.edu/faculty-and-research/disciplines/finance/**) for the most current Plan of Study.**

First Year

Fall

At Community College

		Credits
ACCT 115	Financial Accounting Foundations (DCCC= ACC 101 [3])	4.0
BUSN 111	Foundations for Business (DCCC= BUSN 100 [4])	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
Science Elective (DCCC= DPR 100 [3])		3.0
Society and Culture (DCCC= Diversity and Social Justice Elective [3])		3.0
	Term Credits	17.0

Spring

At Community College

ACCT 116	Managerial Accounting Foundations (DCCC= ACC 112 [3])	4.0
ECON 202	Principles of Macroeconomics (DCCC= ECO 210 [3])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	3.0-6.0
MATH 101	Introduction to Analysis I (DCCC= MAT 135 [3])	4.0
MKTG 201	Introduction to Marketing Management (DCCC= BUS 230 [3])	4.0
	Term Credits	19.0-22.0

Second Year

Fall

At Community College

BLAW 201	Business Law I (DCCC= BUS 243 [3])	4.0
BIO 100	Applied Cells, Genetics & Physiology (DCCC= BIO 100 [4])	3.0
COM 270 [WI]	Business Communication (DCCC= BUS 130 [3])	3.0
ECON 201	Principles of Microeconomics (DCCC= ECO 220 [3])	4.0
Free Elective (DCCC= BUS 210 [3])		3.0
	Term Credits	17.0

Spring

At Community College

MATH 102	Introduction to Analysis II (DCCC= MAT 136 [3])	4.0
STAT 201	Introduction to Business Statistics (DCCC= BUS 220 [3])	4.0
PHIL 105	Critical Reasoning (DCCC= PHI 110 [3])	3.0
INTB 200	International Business (DCCC= BUS 101 [3])	4.0
CHEM 151	Applied Chemistry (DCCC= CHE 100 [4])	3.0
Excess Free Elective Credit		15.0
	Term Credits	33.0

Third Year

Fall

At Drexel

COOP 101	Career Management and Professional Development	0.0
FIN 301	Introduction to Finance	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
STAT 202	Business Statistics II	4.0
UNIV B101	The Drexel Experience	1.0
English Literature Elective		3.0
	Term Credits	16.0

Winter

At Drexel

FIN 302	Intermediate Corporate Finance	4.0
FIN 321	Investment Securities & Markets	4.0
MIS 200	Management Information Systems	4.0
HIST Elective		4.0
	Term Credits	16.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fourth Year

Fall

At Drexel

CIVC 101	Introduction to Civic Engagement	1.0
FIN 325	Financial Institutions and Markets	4.0
OPM 200	Operations Management	4.0
PSY 101	General Psychology I	3.0
General Education Elective		3.0
	Term Credits	15.0

Winter

At Drexel

STAT 202, MGMT 260, MGMT 451, MGMT 370, or MGMT 371	Business Statistics II Introduction to Entrepreneurship Management Simulation For-Profit Business Consulting Nonprofit Business Consulting	4.0
FIN Elective		4.0
FIN Elective		4.0
Social Science Elective		3.0
	Term Credits	15.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

FIN Elective		4.0
FIN Elective		4.0
General Education Electives		6.0
	Term Credits	14.0

Winter

At Drexel

MGMT 450	Strategy and Competitive Advantage	4.0
UNIV B201 [WI]	Career Management	1.0
FIN Elective		4.0

Fine Arts Elective		3.0
General Education Elective		3.0
	Term Credits	15.0

Total Credit: 177.0-180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Business Administration - Major in Marketing

Drexel Degree Name: BSBA in Marketing

Community College Degree Name: A.S. in Business Administration

Sample Plan of Study - First & Second Year at Delaware County Community College

62 Credits at DCCC Transfer as 89 Credits at Drexel

First Year

Fall		Credits
At Community College		
ACCT 115	Financial Accounting Foundations (DCCC= ACC 101 [3])	4.0
BUSN 111	Foundations for Business (DCCC= BUS 100 [3])	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100[3]) English Composition I	3.0
Science Elective (DCCC= DPR 100 [3])		3.0
Society and Culture (DCCC= Diversity and Social Justice Elective [3])		3.0
	Term Credits	17.0

Spring		
At Community College		
ACCT 116	Managerial Accounting Foundations (DCCC= ACC 112 [3])	4.0
ECON 202	Principles of Macroeconomics (DCCC= ECO 210 [3])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
MATH 101	Introduction to Analysis I (DCCC= MAT 135 [3])	4.0
MKTG 201	Introduction to Marketing Management (DCCC= BUS 230 [3])	4.0
	Term Credits	22.0

Second Year

Fall		
At Community College		
BIO 100	Applied Cells, Genetics & Physiology (DCCC= BIO 100 [4])	3.0
BLAW 201	Business Law I (DCCC= BUS 243 [3])	4.0
COM 270 [WI]	Business Communication (DCCC= BUS 130 [3])	3.0
ECON 201	Principles of Microeconomics (DCCC= ECO 220 [3])	4.0
Free Elective (DCCC= BUS 210 [3])		4.5
	Term Credits	18.5

Spring		
At Community College		
CHEM 151	Applied Chemistry (DCCC= CHE 100 [4])	3.0
INTB 200	International Business (DCCC= BUS 101 [3])	4.0
MATH 102	Introduction to Analysis II (DCCC= MAT 136 [3])	4.0
PHIL 105	Critical Reasoning (DCCC= PHI 110 [3])	3.0
STAT 201	Introduction to Business Statistics (DCCC= BUS 220 [3])	4.0
Excess Free Elective Credit		13.5
	Term Credits	31.5

Third Year

Fall		
At Drexel		
COOP 101	Career Management and Professional Development	0.0
FIN 301	Introduction to Finance	4.0
OPM 200	Operations Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
English Literature Elective		3.0
	Term Credits	15.0

Winter		
At Drexel		
MIS 200	Management Information Systems	4.0
MKTG 326	Marketing Insights	4.0
UNIV B101	The Drexel Experience	1.0
HIST Elective		4.0
MKTG Elective		4.0
	Term Credits	17.0

Spring		
At Drexel		
CO-OP		
	Term Credits	0.0

Summer		
At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
CIVC 101	Introduction to Civic Engagement	1.0
PSY 101	General Psychology I	3.0
STAT 202, MGMT 260, MGMT 451, MGMT 370, or MGMT 371	Business Statistics II Introduction to Entrepreneurship Management Simulation For-Profit Business Consulting Nonprofit Business Consulting	4.0
MKTG Elective		4.0
General Education Elective		3.0
	Term Credits	15.0
Winter		
At Drexel		
MKTG 356	Consumer Behavior	4.0
STAT 202, MGMT 260, MGMT 451, MGMT 370, or MGMT 371	Business Statistics II Introduction to Entrepreneurship Management Simulation For-Profit Business Consulting Nonprofit Business Consulting	4.0
MKTG Elective		4.0
Social Science Elective		3.0
	Term Credits	15.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
MKTG 380	Seminar in Marketing Strategy	4.0
MKTG Elective		4.0
General Education Electives		6.0
	Term Credits	14.0
Winter		
At Drexel		
MGMT 450	Strategy and Competitive Advantage	4.0
UNIV B201 [WI]	Career Management	1.0
General Education Elective		3.0
MKTG Elective		4.0
Fine Arts Elective		3.0
	Term Credits	15.0

Total Credit: 180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Chemical Engineering

Drexel Degree Name: BSCHE - Chemical Engineering

Community College Degree Name: A.S. in Engineering

Sample Plan of Study - First & Second Year at Delaware County Community College

71 Credits at DCCC transfers over as 87 Credits at Drexel

Please contact the Department of Chemical and Biological Engineering **(**https://drexel.edu/engineering/academics/departments/chemical-biological-engineering/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
CHEM 101	General Chemistry I (DCCC= CHE 110 [4])	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
MATH 121	Calculus I (DCCC= MAT 160 [4])	4.0
Free Elective (DCCC= EGR 150 [1])		1.5
ENGR 111	Introduction to Engineering Design & Data Analysis (DCCC= DPR 110 [3])	3.0
	Term Credits	15.0

Spring

At Community College		
CHEM 102	General Chemistry II (DCCC= CHE 111 [4])	4.5
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
MATH 122	Calculus II (DCCC= MAT 161 [4])	4.0
PHYS 101	Fundamentals of Physics I (DCCC= PHY 131 [4])	4.0

General Education Elective (DCCC= Social Science Elective [3])		4.5
	Term Credits	23.0
Summer		
At Community College		
CHEM 241	Organic Chemistry I (DCCC= CHE 200 [5])	4.0
	Term Credits	4.0
Second Year		
Fall		
At Community College		
MATH 200	Multivariate Calculus (DCCC= MAT 260 [3])	4.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (DCCC= PHY 132 [4])	8.0
MEM 202	Statics (DCCC= EGR 200 [3])	3.0
General Education Electives (DCCC= Social Science Electives [6])		9.0
	Term Credits	24.0
Spring		
At Community College		
MATH 210	Differential Equations (DCCC= MAT 261 [3])	4.0
General Education Elective (DCCC= Humanities Elective [3])		4.5
MATH 201	Linear Algebra (DCCC= MAT 200 [3])	4.0
General Ed Elective (DCCC=COM 100 or 111 [3])		4.5
	Term Credits	17.0
Summer		
CHEM 242	Organic Chemistry II (DCCC= CHE 201 [5])	4.0
	Term Credits	4.0
Third Year		
Fall		
At Drexel		
ENGR 220	Fundamentals of Materials	4.0
CHE 211	Material and Energy Balances I	4.0
CHE 220	Computational Methods in Chemical Engineering I	3.0
ENGR 113	First-Year Engineering Design	3.0
	Term Credits	14.0
Winter		
At Drexel		
CHE 212	Material and Energy Balances II	4.0
ENGR 131	Introductory Programming for Engineers	3.0
BIO Elective		3.0
CHE 230	Chemical Engineering Thermodynamics I	4.0
CIVC 101	Introduction to Civic Engagement	1.0
	Term Credits	15.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fourth Year		
Fall		
At Drexel		
CHE 330	Chemical Engineering Thermodynamics II	4.0
CHE 350	Statistics and Design of Experiments	3.0
CHE 341	Fluid Mechanics	4.0
CHEM 356	Physical Chemistry Laboratory	2.0
	Term Credits	13.0
Winter		
At Drexel		
CHE 320	Computational Methods in Chemical Engineering II	3.0
CHE 342	Heat Transfer	4.0

CHE 343	Mass Transfer	4.0
CHE 351	Chemical Engineering Laboratory I	2.5
	Term Credits	13.5
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
CHE 471	Process Design I	4.0
CHE 331	Separation Processes	3.0
CHE 453	Chemical Engineering Laboratory III	2.5
CHE 362	Chemical Kinetics and Reactor Design	4.0
CHE 464	Process Dynamics and Control	3.0
	Term Credits	16.5
Winter		
At Drexel		
CHE 352	Chemical Engineering Laboratory II	2.5
CHE 372	Integrated Case Studies in Chemical Engineering	3.0
CHE 472	Process Design II	3.0
CHE Tech Electives		6.0
CHE 371	Engineering Economics and Professional Practice	3.0
	Term Credits	17.5
Spring		
At Drexel		
CHE 466	Chemical Process Safety	3.0
Tech Elective		3.0
Tech Elective		3.0
CHE 473	Process Design III	3.0
CHEC 353	Physical Chemistry and Applications III	4.0
	Term Credits	16.0

Total Credit: 192.5

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Chemistry

Drexel Degree Name: B.S. Chemistry

Community College Degree Name: A.S in Mathematics/Natural Science

Sample Plan of Study - First & Second Year at Delaware County Community College

67 Credits at DCCC transfer over as 85-86 Credits at Drexel

Please contact the Department of Chemistry **(**https://drexel.edu/coas/academics/departments-centers/chemistry/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
INFO 101 or CS 150	Introduction to Computing and Security Technology (DCCC= DPR 100 or DPR 101 [3]) Computer Science Principles	3.0
CHEM 121	Majors Chemistry I (DCCC= CHEM 110 [4])	5.0
MATH 121	Calculus I (DCCC= MAT 160 [4])	4.0
Liberal Studies Elective (DCCC= Any transferable Diveresity and Social Justice [3])		3.0-4.0
	Term Credits	18.0-19.0

Spring

At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
CHEM 122 & CHEM 123	Majors Chemistry II (DCCC= CHEM 111 [4])	10.5
MATH 122 & MATH 123	Calculus II (DCCC= Math Elective; *MAT 161 [4])	8.0
Liberal Studies Elective (DCCC= Global Understanding designated Humanities Course [3])		
Free Elective (DCCC= Social Science Elective [3])		3.0
	Term Credits	27.5

Second Year

Fall

At Community College		
COM 230 or 111	Techniques of Speaking (DCCC= COMM 100 or COMM 111 [3]) Principles of Communication	3.0
CHEM 246	Organic Chemistry for Majors I (DCCC= *take CHE 200 for Mathematics/Laboratory Science[5])	6.5
PHYS 101	Fundamentals of Physics I (DCCC= *take PHY 131 [4])	4.0
BIO 122	Cells and Genetics (DCCC= *Take BIO 110 [4] for open elective)	4.5
Free Elective (DCCC = Social Science Elective [3])		
	Term Credits	18.0

Spring

At Community College		
CHEM 248 & CHEM 249	Organic Chemistry for Majors II (DCCC= *Take CHE 201 [4] for Mathematics/Laboratory Science)	13.5
PHYS 102 & PHYS 201	Fundamentals of Physics II (DCCC= *Take PHY 132 [4] for Mathematics/Laboratory Science)	8.0
Free Elective (DCCC= Open Electives [3-4])		
Free Elective (DCCC= Open Electives [3-4])		
	Term Credits	21.5

Third Year

Fall

At Drexel		
CHEM 230	Quantitative Analysis	4.0
CHEM 231 [WI]	Quantitative Analysis Laboratory	2.0
CHEM 253	Thermodynamics and Kinetics	4.0
BIO 214	Principles of Cell Biology	4.0
COOP 101	Career Management and Professional Development	0.0
	Term Credits	14.0

Winter

At Drexel		
CHEM 270	Software Skills for Chemists	3.0
CHEM 357 [WI]	Physical Chemistry Laboratory I	2.5
MATH 200	Multivariate Calculus	4.0
Free Elective		6.0
	Term Credits	15.5

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
CHEM 355	Physical Chemistry IV	3.0
CHEM 367	Chemical Information Retrieval	3.0
CHEM 421	Inorganic Chemistry I	3.0
CHEM 430	Analytical Chemistry I	3.0
UNIV S201	Looking Forward: Academics and Careers	1.0
Free Elective		3.0
	Term Credits	16.0

Winter

At Drexel		
CHEM 359	Atomic and Molecular Spectroscopy	3.0
CHEM 420	Molecular Symmetry and Group Theory Applied Chemistry	3.0
CHEM 431 [WI]	Analytical Chemistry II	4.0
MATH 201	Linear Algebra	4.0
	Term Credits	14.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel		
CHEM 346	Qualitative Organic Chemistry	5.5
CHEM 358	Physical Chemistry Laboratory II	2.5
CHEM 493	Senior Research Project	3.0
BIO 311 or 404	Biochemistry Structure and Function of Biomolecules	4.0
	Term Credits	15.0

Winter

	At Drexel		
CHEM 493	Senior Research Project		3.0
BIO 306	Biochemistry Laboratory		2.0
Technical Elective			3.0
Free Elective			3.0
Free Elective			3.0
Free elective			3.0
	Term Credits		17.0
Spring			
	At Drexel		
CHEM 422	Inorganic Chemistry II		3.0
CHEM 425	Inorganic Chemistry Laboratory		4.0
CHEM 493	Senior Research Project		3.0
Technical Elective			3.0
Free elective			3.0
	Term Credits		16.0

Total Credit: 192.5-193.5

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Civil Engineering

Drexel Degree Name: B.S. Civil Engineering
Community College Degree Name: A.S in Engineering
Sample Plan of Study - First & Second Year at Delaware County Community College
59 Credits at DCCC transfer over as 82.5 Credits at Drexel

First Year

Fall		**Credits**
	At Community College	
CHEM 101	General Chemistry I (DCCC= MAT 160 [4])	3.5
CS 190	Selected Computer Language (DCCC= DPR 101 [3])	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3])	3.0
MATH 121	Calculus I (DCCC= MAT 160 [4])	4.0
Free Elective (DCCC= EGR 150 [1])		1.5
	Term Credits	15.0
Spring		
	At Community College	
CHEM 102	General Chemistry II (DCCC= CHE 111 [4])	4.5
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
MATH 122 & MATH 123	Calculus II (DCCC= ENG 112 [3])	8.0
PHYS 101	Fundamentals of Physics I (DCCC= PHY 131 [4])	4.0
	Term Credits	22.5

Second Year

Fall		
	At Community College	
MATH 200	Multivariate Calculus (DCCC= MAT 260 [4])	4.0
MEM 202	Statics (DCCC= EGR 200 [4])	3.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (DCCC= PHY 132 [4])	8.0
General Education Elective (DCCC= Any transferable Diversity and Social Justice Social Science Course [3])		4.5
General Education Elective (DCCC= Any transferable Global Understanding designated Social Science Course [3])		4.5
	Term Credits	24.0
Spring		
	At Community College	
COM T180	Special Topics in Communication Theory (DCCC= COM 100 or COM 111 [3])	4.5
MATH 210	Differential Equations	4.0
MEM 238	Dynamics (DCCC= EGR 201 [3])	4.0
General Education Elective (DCCC= Humanities Elective [3])		4.5
	Term Credits	17.0
Summer		
	At Community College	
MATH 201	Linear Algebra (DCCC= MAT 200 [3])	4.0
	Term Credits	4.0

Third Year

Fall		
	At Drexel	
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
COOP 101	Career Management and Professional Development	0.0
ENGR 111	Introduction to Engineering Design & Data Analysis	3.0

ENGR 113	First-Year Engineering Design	3.0
ENGR 220	Fundamentals of Materials	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	14.0

Winter

At Drexel

BIO 141	Essential Biology	4.5
CAEE 203	System Balances and Design in CAEE	3.0
CIVE 240 [WI]	Engineering Economic Analysis	3.0
ENGR 210	Introduction to Thermodynamics	3.0
	Term Credits	13.5

Spring

At Drexel

COOP

	Term Credits	0.0

Summer

At Drexel

COOP

	Term Credits	0.0

Fourth Year

Fall

At Drexel

CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
CIVE 320	Introduction to Fluid Flow	3.0
ENVE 300	Introduction to Environmental Engineering	3.0
MEM 230	Mechanics of Materials I	4.0
	Term Credits	14.0

Winter

At Drexel

CIVE 250	Construction Materials	4.0
CIVE 330	Hydraulics	4.0
General Education Elective		3.0
	Term Credits	11.0

Spring

At Drexel

COOP

	Term Credits	0.0

Summer

At Drexel

COOP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

CAEE 361	Statistical Analysis of Engineering Systems	3.0
CIVE 302	Structural Analysis I	4.0
CIVE 312	Soil Mechanics I	4.0
CIVE 430	Hydrology	3.0
	Term Credits	14.0

Winter

At Drexel

CIVE 303	Structural Design I	3.0
CIVE 315	Soil Mechanics II	4.0
CIVE 375	Structural Material Behavior	3.0
General Education Elective		3.0
	Term Credits	13.0

Spring

At Drexel

COOP

	Term Credits	0.0

Summer

At Drexel

COOP

	Term Credits	0.0

Sixth Year

Fall

At Drexel

CAE 491 [WI]	Senior Design Project I	3.0
CIVE 477 [WI]	Seminar	2.0
Professional Electives		6.0
	Term Credits	11.0

Winter

At Drexel

CAE 492 [WI]	Senior Design Project II	3.0
CIVE 478 [WI]	Seminar	1.0
Professional Electives		6.0
	Term Credits	10.0

Spring

At Drexel

CAE 493 [WI]	Senior Design Project III	3.0
Professional Electives		6.0
	Term Credits	9.0

Total Credit: 192.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BA in Communication - Journalism Concentration

Drexel Degree Name: B.A. Communication, Journalism Concentration

Community College Degree Name: A.A in Communication Arts; Journalism Option

Sample Plan of Study - First & Second Year at Delaware County Community College

61 Credits at DCCC transfer over as 88-90 credits at Drexel

Please contact the Department of Communication **(**https://drexel.edu/coas/academics/departments-centers/communication/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
HIST Elective (DCCC= Pick One; HIST 110, 120, 150, 160 [3])		4.0
Communication Elective (DCCC= COMM 100 [3])		3.0
MATH Elective (DCCC= Pick One MAT 120, 121, 151, 152 160 [3-4])		4.0
Foreign Language (DCCC= Humanities Elective; Foreign Language Recommended [3])		4.0
	Term Credits	18.0

Spring

At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
COM 160	Introduction to Journalism (DCCC= ENG 130 [3])	3.0
INFO 101 or CS 161	Introduction to Computing and Security Technology (DCCC= DPR 100 or DPR 101 [3]) Introduction to Computing	3.0
SOC or PSY Elective (ANY PSY or SOC Course [3])		3.0
Foreign Language (DCCC= Humanities Elective; Recommended Foreign Langage [3])		4.0
	Term Credits	19.0

Second Year

Fall

At Community College		
COM 282 [WI]	Public Relations Writing (DCCC= ENG 131 [3])	3.0
COM 150	Mass Media and Society (DCCC= COMM 104 [3])	3.0
COM 181, 340, or 335	Public Relations Principles and Theory (DCCC= Program Option Elective; Take COMM 115, IMM 110 or IMM 120 [3]) Desktop Publishing Digital Publishing	3.0
Science Elective (DCCC= Any transferable Scientific Inquiry designated science course [4])		4.0
Humanities Elective (DCCC=Humanities Elective [3])		3.0
	Term Credits	16.0

Spring

At Community College

COM 181, 340, or 335	Public Relations Principles and Theory (DCCC= Program Elective; Take COMM 115, IMM 110 or IMM 120 [3]) Desktop Publishing Digital Publishing	3.0
Science or Math Elective (DCCC=Science or Math Elective [3-4])		3.0-4.0
Social Science Elective (DCCC=Social Science Elective [3-4])		3.0-4.0
Free Elective (DCCC= Open Elective [3])		3.0
Excess Free Electives (semester to quarter)		23.0
	Term Credits	35.0-37.0

Third Year

Fall

At Drexel		
COM 101	Human Communication	3.0
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
Social Science Elective		3.0
COM 261	Advanced Journalism	3.0
Humanities Elective		3.0
	Term Credits	13.0

Winter

At Drexel		
Science Elective		3.0
COM 210	Theory and Models of Communication	3.0
COM 240	New Technologies In Communication	3.0
COM 266	Copy Editing for the Media	3.0
	Term Credits	12.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
COM 315	Investigative Journalism	3.0
TVPR 220	TV News Writing	3.0
COM 220	Qualitative Research Methods	3.0
LING 101	Introduction to Linguistics	0.0-3.0
COM Elective		3.0
	Term Credits	12.0-15.0

Winter

At Drexel		
COM 230	Techniques of Speaking	3.0
PSY 101	General Psychology I	3.0
COM 221	Quantitative Research Methods in Communication	3.0
COM Elective		3.0
COM Elective		3.0
	Term Credits	15.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel

COM 491	Senior Project in Communication I	3.0
COM 365	Journalists, the Courts, and the Law	3.0
PHIL 305	Ethics and the Media	3.0
International Studies Elective		3.0
Free Elective		4.0
	Term Credits	16.0

Winter

At Drexel

COM 492	Senior Project in Communication II	3.0
Social Science Elective		3.0
International Studies Elective		3.0
Diversity Studies Elective		3.0
	Term Credits	12.0

Spring

At Drexel

COM 400	Seminar in Communication	3.0
Interpersonal Communication		3.0
Humanities Elective		3.0
Social Media in Communication		3.0
	Term Credits	12.0

Total Credit: 180.0-185.0

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BA in Communication - Open Concentration

Drexel Degree Name: B.A. Communication, Open Concentration

Community College Degree Name: A.A in Communication Arts; Communication Studies

Sample Plan of Study - First & Second Year at Delaware County Community College

61 Credits at DCCC transfer over as 89 Credits at Drexel

Please contact the Department of Communication **(**https://drexel.edu/coas/academics/departments-centers/communication/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
CS 161	Introduction to Computing (DCCC= DPR 100 or DPR 101 [3])	3.0
HIST Elective (DCCC= Pick One; HIS 110, 120, 150 160 [3])		3.0
Foreign Language (DCCC= Humanities Elective; Foreign Language Recommended [3])		4.0
Communication Elective (DCCC= COMM 102 or COMM 105[3])		3.0
	Term Credits	16.0

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
COM 150	Mass Media and Society (DCCC= COMM 104 [3])	3.0
MATH Elective (DCCC= Pick One; MAT 120, 121, 151, 152 or 160 [3-4])		4.0
Science Elective (DCCC= Any transferable Scientific Inquiry designated science course [4])		4.0
Foreign Language (DCCC= Humanities Elective; Foreign Language Recommended [3-4])		4.0
	Term Credits	21.0

Second Year

Fall		
At Community College		
COM 230	Techniques of Speaking (DCCC= COMM 111 [3])	3.0
COM 345	Intercultural Communication (DCCC= COMM 102 or COMM 105 [3])	3.0
PSY or SOC Elective (DCCC= Any PSY or SOC Course [3])		3.0
Humanities Elective (DCCC= Humanities Elective [3])		3.0
Math or Science (DCCC= Science or Mathematics Elective [3])		3.0
	Term Credits	15.0

Spring		
At Community College		
COM T180	Special Topics in Communication Theory (DCCC= Program Electives [6])	3.0
Free Elective (DCCC= Open Elective [3])		
Social Science Elective (DCCC= Social Science Elective [3])		3.0
Humanities Elective (DCCC= Humanities Elective [3])		3.0

Excess Free Electives (Semester to Quarter)		29.0
	Term Credits	38.0
Third Year		
Fall		
At Drexel		
COM 101	Human Communication	3.0
Foreign Language		4.0
COM 181	Public Relations Principles and Theory	3.0
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
COM 160	Introduction to Journalism	3.0
	Term Credits	14.0
Winter		
At Drexel		
Science Elective		3.0
Communication Elective		3.0
Foreign Language		4.0
COM 240	New Technologies In Communication	3.0
COM 210	Theory and Models of Communication	3.0
	Term Credits	16.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fourth Year		
Fall		
At Drexel		
Communication Elective		3.0
Free Elective		3.0
COM 220	Qualitative Research Methods	3.0
LING 101	Introduction to Linguistics	0.0-3.0
COM 310 [WI]	Technical Communication	3.0
	Term Credits	12.0-15.0
Winter		
At Drexel		
Free Elective		3.0
Social Science Elective		3.0
COM 221	Quantitative Research Methods in Communication	3.0
Communication Elective		3.0
Advanced COM Elective		3.0
	Term Credits	15.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
COM 491	Senior Project in Communication I	3.0
COM 282 [WI]	Public Relations Writing	3.0
Advanced COM Elective		3.0
PHIL 305	Ethics and the Media	3.0

Free Elective		3.0
	Term Credits	15.0
Winter		
At Drexel		
COM 492	Senior Project in Communication II	3.0
International Studies Elective		3.0
Diversity Studies Elective		3.0
Interpersonal Communication		3.0
Social Media in Communication		3.0
	Term Credits	15.0

Total Credit: 177.0-180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Criminology and Justice Studies - Criminal Justice Concentration

Drexel Degree Name: B.S. Criminology and Justice Studies, Criminal Justice Concentration

Community College Degree Name: A.A in Administration of Justice

Sample Plan of Study - First & Second Year at Delaware County Community College

61 Credits at DCCC transfers over at 88.5-90 Credits at Drexel

Please contact the Department of Criminology and Justice Studies **(**https://drexel.edu/coas/academics/departments-centers/criminology-justice-studies/**) for the most current Plan of Study.**

First Year

Fall

At Community College

		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
CJS 101	Introduction to Criminal Justice (DCCC= ADJ 101 [3])	3.0
Math Elective (DCCC= Pick One; MAT 120, 121, 151, 152, 160 [3-4])		3.0-4.0
COM 230	Techniques of Speaking (DCCC= COMM 111 [3])	3.0
SOC 101 or 115	Introduction to Sociology (DCCC= SOC 110 or SOC 120 [3]) Social Problems	3.0
	Term Credits	15.0-16.0

Spring

At Community College

ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
CJS 375	Criminal Procedure (DCCC= ADJ 241 [3])	3.0
INFO 101	Introduction to Computing and Security Technology (DCCC= DPR 100 [3])	3.0
CJS 265	Criminal Investigation (DCCC= ADJ 120 [3])	3.0
Transfer Social Science (DCCC= Social Science Elective* [3])*Take either HIS or POL		3.0
	Term Credits	18.0

Second Year

Fall

At Community College

PHIL 330	Criminal Justice Ethics (DCCC= ADJ 225 [3])	3.0
CJS T180	Special Topics in Criminology & Justice Studies (DCCC= ADJ 240 [3])	3.0
CJS T180	Special Topics in Criminology & Justice Studies (DCCC= ADJ Elective [3])	3.0
Transfer Social Science (DCCC= Social Science Elective* [3])*Take either HIS or POL		3.0
Transfer Humanities (DCCC= Humanities Elective** [3])**Will count as Fine Arts Elect at Drexel		3.0
	Term Credits	15.0

Spring

At Community College

CJS 289	Terrorism (DCCC= ADJ 202 [3])	3.0
CJS 278	Introduction to Law Enforcement (DCCC= ADJ 250 [3])	3.0
CJS 277	Introduction to Correctional Practices (DCCC= ADJ 260 [3])	3.0
CJS 360	Juvenile Justice (DCCC= ADJ 261 [3])	3.0
Science Elective (DCCC= Pick One; BIO 100, 110, 150 CHE 101, 110, PHY 110 [4])		4.0
Excess Free Elective Credits from Semester to Drexel Credits		24.5-25.0
	Term Credits	40.5-41.0

Third Year

Fall

At Drexel

Math Course		3.0-4.0
CJS 100	Freshman Seminar in Crime and Justice	3.0
CJS 250	Research Methods & Analytics I	3.0
CJS 290	Crime and Public Policy	3.0
PSY 101	General Psychology I	3.0
	Term Credits	15.0-16.0

Winter

At Drexel

CJS 300	Research Methods and Analytics II	3.0
CJS 376	Sentencing	3.0
Science Course		3.0-4.0
CJS 280	Communities and Crime	3.0
CJS Elective		3.0
	Term Credits	15.0-16.0

Spring

At Drexel

CJS 276	Introduction to Computer Crime	3.0
PSCI 100	Introduction to Political Science	4.0
CJS 220	Crime and the City	3.0
CJS Elective		3.0
	Term Credits	13.0

Summer

At Drexel

CJS 260	Justice in Our Community	4.0
ANTH 101	Introduction to Cultural Diversity	3.0
CJS Elective		3.0
ENGL 200 Level or Higher		3.0
	Term Credits	13.0

Fourth Year

Fall

At Drexel

PHIL 101	Introduction to Western Philosophy	3.0
CJS 210	Race, Crime, and Justice	3.0
CIVC 101	Introduction to Civic Engagement	1.0
CJS Elective		3.0
Free Elective		3.0
	Term Credits	13.0

Winter

At Drexel

CJS 266	Crime Prevention Planning	3.0
CJS 261	Prison, Society and You	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
CJS Elective		3.0
Free Elective		3.0
	Term Credits	13.0

Spring

At Drexel

CO-OP		
	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

CJS Elective		3.0
Free Elective		3.0
Free Elective		3.0
Free Elective		3.0
	Term Credits	12.0

Total Credit: 182.5-186.0

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Culinary Arts and Science

Drexel Degree Name: B.S. Culinary Arts and Science

Community College Degree Name: A.A.S in Culinary Arts

Sample Plan of Study - First & Second Year at Delaware County Community College

61 Credits at DCCC transfers over as 70 Credits at Drexel

First Year

Fall		**Credits**
At Community College		
CULA 115	Culinary Fundamentals (DCCC= CUL 115 [3])	3.0
CULA 125	Foundations of Professional Baking (DCCC= CUL 150 [3])	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
FDSC 270	Microbial Food Safety and Sanitation (DCCC= HRM 110 [3])	4.0
MATH 100	Fundamentals of Mathematics (DCCC= BUS 104 [3])	3.0
	Term Credits	16.0

Spring

At Community College		
HRM 220	Purchasing for the Hospitality Industry (DCCC= CUL 210 [3])	3.0
HRM 350	Cost Controls in Hospitality (DCCC= CUL 215 [3])	3.0
CULA 120 & CULA 121	Techniques and Traditions I (DCCC= CUL 230 [3])	6.0
INFO 101	Introduction to Computing and Security Technology (DCCC= DPR 100 [3])	3.0
Free Elective (DCCC=Global Understanding Designated Course [3])		3.0
	Term Credits	18.0

Second Year

Fall

At Community College		
HRM 110	Introduction to the Hospitality Industry (DCCC= HRM 100 [3])	3.0
CULA 220 & CULA 225	Patisserie I (DCCC= CUL 151 [3])	6.0
CULA 325	Garde Manger Laboratory (DCCC= CUL 231 [3])	3.0
COM 270 [WI]	Business Communication (DCCC= BUS 130 [3])	3.0
Free Elective (DCCC= Scientific Inquiry Designated Science Course [4])		6.0
	Term Credits	21.0

Spring

At Community College		
CULA 290	Culinary Arts Practicum I (DCCC= CUL 199 [3])	3.0
HRM 120	Principles of Food-Service Management (DCCC= HRM 253 [3])	3.0
NFS 100 & NFS 101	Nutrition, Foods, and Health (DCCC= CUL 220 [3])	3.0
CULA 303	Global Cuisine Studio (DCCC= CUL 232 [3])	3.0
SOC 101	Introduction to Sociology (DCCC= SOC 110 [3])	3.0
	Term Credits	15.0

Third Year

Fall

At Drexel		
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
MATH 101	Introduction to Analysis I	4.0
CHEM 201	Why Things Work: Everyday Chemistry	3.0
FDSC 100	ServSafe	1.0
FDSC 120	Food and the Senses	3.0
CULA 316	Butchery Laboratory	2.0
	Term Credits	16.0

Winter

At Drexel		
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
FDSC 154	Science of Food and Cooking	4.0
FDSC 350	Experimental Foods: Product Development	3.0
CULA 235	Professional Dining Room Management	3.0
CULA 320	Advanced Culinary Studio	3.0
	Term Credits	16.0

Spring

At Drexel		
FDSC 401	Modernist Cuisine	3.0
CULA 303	Global Cuisine Studio	3.0
CULA 216	A la Carte	3.0
Minor		4.0
	Term Credits	13.0

Summer

At Drexel		
Minor		4.0
Minor		4.0
Arts and Humanities		3.0
Arts and Humanities		3.0
	Term Credits	14.0

Fourth Year

Fall

At Drexel		
Minor		4.0
HRM 150	Food & Beverage Customer Service	3.0
CULA 440	Food in the Arts	3.0
CULA 405 [WI]	Culture and Gastronomy I	3.0

CULA 421	Senior Design Project I	2.0
	Term Credits	15.0
Winter		
At Drexel		
Minor		4.0
HRM 160	Laws of the Hospitality Industry	3.0
HRM 330	Hospitality Marketing and Branding	3.0
HRM 335	Beverage Management	3.0
CULA 422	Senior Design Project II	2.0
	Term Credits	15.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
Minor		4.0
HRM 435	Wine Regions of the World	3.0
CULA 400	Directed Studies with a Master Chef	3.0
CULA 423	Senior Design Project III	2.0
	Term Credits	12.0

Total Credit: 171.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Electrical Engineering

Drexel Degree Name: B.S in Electrical Engineering

Community College Degree Name: A.S. in Engineering

Sample Plan of Study - First & Second Year at Delaware County Community College

64 Credits at DCCC transfers over as 88.5 Credits at Drexel

Please contact the Department of Electrical and Computer Engineering **(**https://drexel.edu/engineering/academics/departments/electrical-computer-engineering/**) for the most current Plan of Study.**

First Year		
Fall		**Credits**
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
CHEM 101	General Chemistry I (DCCC= CHE 110 [4])	3.5
ENGR 111	Introduction to Engineering Design & Data Analysis (DCCC= DPR 110 [3])	3.0
MATH 121	Calculus I (DCCC= MAT 160 [4])	4.0
General Education Elective (DCCC= Social Science Elective [3])		4.5
	Term Credits	18.0
Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
MATH 122 & MATH 123	Calculus II (DCCC= MAT 161 [4])	8.0
CHEM 102	General Chemistry II (DCCC= CHE 111 [4])	4.5
PHYS 101	Fundamentals of Physics I (DCCC= PHY 131 [4])	4.0
Free Elective (DCCC= EGR 150 [1])		1.5
	Term Credits	24.0
Second Year		
Fall		
At Community College		
MATH 200	Multivariate Calculus (DCCC= MAT 260 [3])	4.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (DCCC= PHY 132 [4])	8.0
General Education Elective (DCCC= Social Science Elective [3])		4.5
MATH 201 or ENGR 231	Linear Algebra (DCCC= MAT 200 [3]) Linear Engineering Systems	4.0
General Education Elective (DCCC= Social Science Elective [3])		4.5
	Term Credits	25.0
Spring		
At Community College		
General Education Elective (DCCC= COM 100 or 111 [3])		4.5
MATH 210 or ENGR 232	Differential Equations (DCCC= MAT 261 [3]) Dynamic Engineering Systems	4.0

ECE 201	Foundations of Electric Circuits I (DCCC= EGR 210 [3])	4.0
General Education Elective (DCCC= Social Science Elective [3])		4.5
General Education Elective (DCCC= Humanities Elective [3])		4.5
	Term Credits	21.5

Third Year
Fall
At Drexel

ECE 200	Digital Logic Design	4.0
ENGR 220	Fundamentals of Materials	4.0
UNIV E101	The Drexel Experience	0.0-2.0
COOP 101	Career Management and Professional Development	0.0
COM Elective		3.0
ENGR 113	First-Year Engineering Design	3.0
	Term Credits	14.0-16.0

Winter
At Drexel

CIVC 101	Introduction to Civic Engagement	1.0
MATH Elective		3.0
ENGR 131	Introductory Programming for Engineers	3.0
Sophomore Engineering Elective		3.0
Free Elective		3.0
	Term Credits	13.0

Spring
At Drexel
CO-OP

| | Term Credits | 0.0 |

Summer
At Drexel
CO-OP

| | Term Credits | 0.0 |

Fourth Year
Fall
At Drexel

ECE 301	Foundations of Electric Circuits II	4.0
ECE 361	Probability and Data Analytics for Engineers	4.0
ECE Electives		6.0
	Term Credits	14.0

Winter
At Drexel

ECE 391	Introduction to Engineering Design Methods	1.0
ECE Electives		9.0
ECES 301	Signals and Systems I	4.0
PHIL 315	Engineering Ethics	3.0
	Term Credits	17.0

Spring
At Drexel
CO-OP

| | Term Credits | 0.0 |

Summer
At Drexel
CO-OP

| | Term Credits | 0.0 |

Fifth Year
Fall
At Drexel

ECE 491 [WI]	Senior Design Project I	2.0
ECE Electives		6.0
ECEP/S/E 4XX Elective		4.0
ECE 303	ECE Laboratory	3.0
ECES 303	Signals and Systems II	3.0
	Term Credits	18.0

Winter
At Drexel

ECE 492 [WI]	Senior Design Project II	2.0
ECE Electives		6.0
ECEP/S/E 4XX Elective		4.0
	Term Credits	12.0

Spring
At Drexel

ECE 493	Senior Design Project III	4.0
ECE Elective		3.0
ECEP/S/E 4XX Elective		4.0
	Term Credits	11.0

Total Credit: 187.5-189.5

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Elementary Education/PK-4 Certification

Drexel Degree Name: B.S in Elementary Education/PK-4 Certification

Community College Degree Name: A.A in Early Childhood Education

Sample Plan of Study - First & Second Year at Delaware County Community College

66 Credits at DCCC transfer over as 90 Credits at Drexel

Please contact the School of Education **(**https://drexel.edu/soe/academics/undergraduate/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective (DCCC= ECE 100 [3])	3.0
EDUC 105 & EDUC 205 & EDUC 305	Freshman Pedagogy Seminar (DCCC= ECE 110 or 112 [3])	3.0
EDUC 120	Child Development I: Typical Development (DCCC= ECE 130 [3])	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3])	3.0
HIST 275 or 275	History of Pennsylvania (DCCC= History Elective [3]) History of Pennsylvania	3.0
Music/Art Elective (DCCC= Humanities Elective MUS 110 or ART 100 [3])		3.0
Excess Free Elective Credit		3.0
	Term Credits	21.0

Spring

At Community College		
BIO 161 & BIO 162	General Biology I (DCCC= Science Elective [4])	6.0
EDUC 335	Engaging the Learner (DCCC= EC E140 [3])	3.0
EDUC 409	Student Teaching Seminar I (DCCC= ECE 120 or ECE 215 [4-3])	9.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
PSY 101	General Psychology I ((DCCC= Psychology Elective PSY 140 [3]))	3.0
	Term Credits	27.0

Second Year

Fall

At Community College		
EDEX 142	Special Education Foundations: Referral and Assessment (DCCC= EDU 220 [3])	3.0
EDUC 210 & EDUC 236	Early Language Development (DCCC= ECE 110 or EDU 207 [3])	6.0
EDUC 335 & EDUC 236	Engaging the Learner (DCCC= ECE 111 [3])	6.0
ENGL 205 [WI]	American Literature I ((DCCC= ENG Literature Elective [3]))	3.0
MATH 172 & MATH 173	Introduction to Analysis B (DCCC= Mathematic Elective MAT 121[3])	6.0
	Term Credits	24.0

Spring

At Community College		
COM 111	Principles of Communication (DCCC= Humanities Elective COM 111 [3])	3.0

EDUC 365	Foundations in Instructing English Language Learners (DCCC= EDU 208 [3])	3.0
EDUC 411	Family and Community Partnerships (DCCC= ECE 201 [3])	3.0
MATH 171	Introduction to Analysis A (DCCC= Mathematics Elective MAT 128 [3])	3.0
NFS 100 & NFS 101	Nutrition, Foods, and Health (DCCC= ECE 121 [4])	3.0
Excess Free Elective Credit		3.0
	Term Credits	18.0

Third Year

Fall

At Drexel		
EDUC 121	Child Development II: Atypical Development	3.0
EDUC 306	Assessment of Young Children I	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
PSY 320 [WI]	Educational Psychology	3.0
	Term Credits	12.0

Winter

At Drexel		
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 314	Science Teaching Methods	3.0
PSY 330	Cognitive Psychology	3.0
	Term Credits	15.0

Spring

At Drexel		
EDEX 346	Literacy and Content Skill Development PreK-8	3.0
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 336	Early Literacy II	3.0
MTED 417	Mathematics Methods and Content: Early Childhood	3.0
SOC 335	Sociology of Education	3.0
	Term Credits	15.0

Summer

At Drexel		
ECON 201	Principles of Microeconomics	4.0
EDUC 338	Expressive Arts for PK-4	3.0
EDUC 355	Social Studies Teaching Methods	3.0
PHYS 151	Applied Physics	3.0
	Term Credits	13.0

Fourth Year

Fall

At Drexel		
CHEM 111	General Chemistry I	4.0
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
Free Electives		6.0
	Term Credits	14.0

Winter

At Drexel		
EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 410 [WI]	Student Teaching	9.0
	Term Credits	12.0

Spring

At Drexel		
EDUC 326 [WI]	Language Arts Processes	3.0
ENVS 260	Environmental Science and Society	3.0
MTED 418	Mathematics Methods and Content	3.0
	Term Credits	9.0

Total Credit: 180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Elementary Education/ PK-4 Certification [T.E.A.C.H. Subarticulation]

Drexel Degree Name: B.S in Elementary Education/PK-4 Certification [PA T.E.A.C.H. Subarticulation]

Community College Degree Name: A.A in Early Childhood Education

Sample Plan of Study - First & Second Year at Delaware County Community College

70 Credits at DCCC transfer over as 89 Credits at Drexel

Please contact the School of Education **(**https://drexel.edu/soe/academics/undergraduate/**)for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC=ENGL 100 [3])	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective (DCCC= ECE 100 [3])	3.0
EDUC 105	Freshman Pedagogy Seminar (DCCC= ECE 110 or EDU 112 [3])	3.0
EDUC 120	Child Development I: Typical Development (DCCC= ECE 130 [3])	3.0
COM 111	Principles of Communication (DCCC= Humanities Elective: COM 111 [3])	3.0
Excess Free Elective Credits		1.0
	Term Credits	16.0

Spring		
At Community College		
BIO 161 & BIO 162	General Biology I (DCCC= BIO 100 [4])	6.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
EDUC 409	Student Teaching Seminar I (DCCC= ECE 120 or EDU 215 [4-3])	9.0
EDUC 324	Current Research in Curriculum & Instruction (DCCC= ECE 140 [3])	3.0
PSY 101 & PSY 330	General Psychology I (DCCC= PSY 140 [3]	6.0
	Term Credits	30.0

Second Year

Fall		
At Community College		
ECON 201	Principles of Microeconomics (DCCC= Economics Elective; ECO 210 or 220 [3])	4.0
EDEX 142	Special Education Foundations: Referral and Assessment (DCCC= EDU 220 [3])	3.0
EDUC 210 & EDUC 236	Early Language Development (DCCC= ECE 110 or EDU 207 [3])	6.0
EDUC 335	Engaging the Learner (DCCC= ECE 111 [3])	3.0
ENGL Childrens Lit Electve (DCCC= ENG 250 [3])		3.0
MATH 172 & MATH 173	Introduction to Analysis B (DCCC= Mathematic Elective; MAT 121 [3])	6.0
	Term Credits	25.0

| | Free Elective | | 6.0 |
| | | Term Credits | 12.0 |

Total Credit: 180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

Spring

At Community College

EDUC 411	Family and Community Partnerships (DCCC= ECE 201 [3])	3.0
EDUC 365	Foundations in Instructing English Language Learners (DCCC= EDU 208 [3])	3.0
MATH 171	Introduction to Analysis A (DCCC= Mathematics Elective MAT 128 [3])	3.0
NFS 100 & NFS 101	Nutrition, Foods, and Health (DCCC= ECE 220 [4])	3.0
PHYS 151	Applied Physics (DCCC= Science Elective PHY 105 [4])	3.0
PSY 320 [WI]	Educational Psychology (DCCC= PSY 235 [3])	3.0
	Term Credits	18.0

Third Year
Fall

At Drexel

EDUC 121	Child Development II: Atypical Development	3.0
EDUC 205	Sophomore Pedagogy Seminar	1.0
EDUC 306	Assessment of Young Children I	3.0
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
ENVS 260	Environmental Science and Society	3.0
	Term Credits	13.0

Winter

At Drexel

EDUC 216	Diversity and Today's Teacher	3.0
EDUC 314	Science Teaching Methods	3.0
EDEX 346	Literacy and Content Skill Development PreK-8	3.0
PSY 330	Cognitive Psychology	3.0
Free Elective		3.0
	Term Credits	15.0

Spring

At Drexel

EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 355	Social Studies Teaching Methods	3.0
MTED 417	Mathematics Methods and Content: Early Childhood	3.0
Free Elective		3.0
	Term Credits	13.0

Summer

At Drexel

EDLT 325	Design for Learning with Digital Media	3.0
EDUC 338	Expressive Arts for PK-4	3.0
MTED 418	Mathematics Methods and Content	3.0
MUSC 130	Introduction to Music	3.0
	Term Credits	12.0

Fourth Year
Fall

At Drexel

CHEM 111	General Chemistry I	4.0
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 336	Early Literacy II	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
Free Elective		3.0
	Term Credits	14.0

Winter

At Drexel

EDUC 410 [WI]	Student Teaching	9.0
EDUC 312	Educational Policy, Law & Advocacy	3.0
	Term Credits	12.0

Spring

At Drexel

| SOC 335 | Sociology of Education | 3.0 |
| EDUC 326 [WI] | Language Arts Processes | 3.0 |

BS in Engineering Technology - Electrical Engineering Technology Concentration

Drexel Degree Name: B.S in Engineering Technology, Concentration in Electrical Engineering Technology

Community College Degree Name: A.S. in Engineering Technology

Sample Plan of Study - First & Second Year at Delaware County Community College

63 Credits at DCCC transfer over as 68 Credits at Drexel

Please contact the Department of Engineering Technology **(**https://drexel.edu/engineering/academics/departments/engineering-technology/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
PHYS 103	General Physics I (DCCC= PHYS 110 [4])	4.0
MATH 110	Precalculus (DCCC = MAT 152 (3))	3.0
Free Elective (DCCC= EGR 150 [1])		1.5
General Educ. Elective (DCCC= Social Science Elective [3])		4.5
	Term Credits	16.0

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
PHYS 104	General Physics II (DCCC= PHYS 111 [4])	4.0
MATH 121	Calculus I (DCCC = MAT 160 (4))	4.0
	Term Credits	14.0

Second Year

Fall		
At Community College		
EET 201	Circuit Analysis I (DCCC= EGT 201 [4])	4.0
EET 205	Digital Electronics (DCCC= EGT 203 [4])	4.0
MATH 122	Calculus II (DCCC = MAT 161 (4))	4.0
Gen Ed Elective (DCCC= Social Science Elective [3])		3.0
Free Elective (DCCC= DPR 101 [3])		3.0
Gen Ed Elective (DCCC= Humanities Elective [3])		3.0
	Term Credits	21.0

Spring		
At Community College		
EET 202	Circuit Analysis II (DCCC= EGT 202 [4])	4.0
EET 206	Analog Electronics I (DCCC= EGT 204 [4])	4.0
Free Elective (DCCC= Social Science Elective [3])		3.0
Free Elective (DCCC= STEM Elective [3])		3.0
Free Elective (DCCC= Humanities Elective [3])		3.0
	Term Credits	17.0

Third Year

Fall		
At Drexel		
COOP 101	Career Management and Professional Development	0.0
COM 230	Techniques of Speaking	3.0
EET 311	Modeling of Engineering Systems	4.0
MET 209	Fluid Power	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	12.0

Winter		
At Drexel		
CIVC 101	Introduction to Civic Engagement	1.0
EET 204	Introduction to Nanotechnology	3.0
EET 208	Introduction to Programming for Embedded Systems	3.0
EET 333 [WI]	Non-Destructive Evaluation of Materials	4.0
MET 100	Graphical Communication	3.0
MET 205	Robotics and Mechatronics	3.0
MHT 205	Thermodynamics I	3.0
	Term Credits	20.0

Spring		
At Drexel		
MET 101	Engineering Materials	3.0
CO-OP		
	Term Credits	3.0

Summer		
At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall		
At Drexel		
EET 206	Analog Electronics I	4.0
EET 317	Analog Electronics II	4.0
EET 325	Microprocessors	3.0
HIST 285	Technology in Historical Perspective	4.0
MET 213	Applied Mechanics	4.0
	Term Credits	19.0

Winter		
At Drexel		
EET 401	Applied Microcontrollers	4.0
INDE 240	Technology Economics	3.0
MET 204	Applied Quality Control	3.0
MHT 226	Measurement Techniques and Instrumentation	3.0
PHIL 315	Engineering Ethics	3.0
	Term Credits	16.0

Spring		
At Drexel		
CO-OP		
	Term Credits	0.0

Summer		
At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall		
At Drexel		
EET 319	PLC Fundamentals	4.0
EET 322	Energy Conversion	4.0
EET 324	Power Electronics	4.0
INDE 370	Industrial Project Management	3.0
MET 421 [WI]	Senior Design Project I	3.0

Technical Elective		3.0
	Term Credits	21.0
Winter		
At Drexel		
EET 313	Signals and Systems I	4.0
EET 323	Electrical Systems Design	3.0
MET 422	Senior Design Project II	3.0
STAT 201	Introduction to Business Statistics	4.0
	Term Credits	14.0
Spring		
At Drexel		
COM 111	Principles of Communication	3.0
EET 209	Fundamentals of Virtual Instrumentation	3.0
MET 423 [WI]	Senior Design Project III	3.0
Technical Elective		3.0
	Term Credits	12.0

Total Credit: 185.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Engineering Technology - Mechanical Engineering Technology Concentration

Drexel Degree Name: B.S in Engineering Technology, Concentration in Mechanical Engineering Technology

Community College Degree Name: A.S. in Engineering Technology

Sample Plan of Study - First & Second Year at Delaware County Community College

63 Credits at DCCC transfer over as 72.5 Credits at Drexel

Please contact the Department of Engineering Technology **(**https://drexel.edu/engineering/academics/departments/engineering-technology/**) for the most current Plan of Study.**

First Year		
Fall		**Credits**
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
MATH 110	Precalculus (DCCC = MAT 152 (3))	3.0
PHYS 103	General Physics I (DCCC= PHYS 110 [4])	4.0
Free Elective (DCCC= EGR 150 [1])		3.0
Free Elective (DCCC= Social Science Elective [3])		3.0
	Term Credits	16.0
Spring		
At Community College		
CHEM 101	General Chemistry I (DCCC= CHE 110 [4])	3.5
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
MATH 121	Calculus I (DCCC=MAT 160[4])	4.0
PHYS 104	General Physics II (DCCC= PHYS 111 [4])	4.0
	Term Credits	17.5
Second Year		
Fall		
At Community College		
EET 201	Circuit Analysis I (DCCC= EGRT 201 [4])	4.0
EET 205	Digital Electronics (DCCC=EGRT 203 [4])	4.0
MATH 122	Calculus II	4.0
Free Elective (DCCC= Social Science Elective [3])		3.0
Free Elective (DCCC= DPR 101 [3])		3.0
Free Elective (DCCC= Humanities Elective [3])		3.0
	Term Credits	21.0
Spring		
At Community College		
EET 202	Circuit Analysis II (DCCC= EGRT 202 [3])	4.0
EET 206	Analog Electronics I (DCCC= EGRT 204 [4])	4.0
Free Elective (DCCC= Social Science Elective [3])		3.0
Free Elective (DCCC= EGRT 203 [4])		4.0
Free Elective (DCCC= Humanities Elective [3])		3.0
	Term Credits	18.0

Third Year

Fall

At Drexel

CHEM 113	General Chemistry I Laboratory	1.5
COM 230	Techniques of Speaking	3.0
COOP 101	Career Management and Professional Development	0.0
EET 311	Modeling of Engineering Systems	4.0
MET 209	Fluid Power	4.0
UNIV E101	The Drexel Experience	1.0
Free Elective		3.0
	Term Credits	16.5

Winter

At Drexel

CIVC 101	Introduction to Civic Engagement	1.0
EET 204	Introduction to Nanotechnology	3.0
EET 208	Introduction to Programming for Embedded Systems	3.0
EET 333 [WI]	Non-Destructive Evaluation of Materials	4.0
MET 100	Graphical Communication	3.0
MET 205	Robotics and Mechatronics	3.0
MHT 205	Thermodynamics I	3.0
	Term Credits	20.0

Spring

At Drexel

CO-OP

MET 101	Engineering Materials	3.0
	Term Credits	3.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fourth Year

Fall

At Drexel

HIST 285	Technology in Historical Perspective	4.0
MET 316	Computer Numerical Control	3.0
MHT 206	Thermodynamics II	3.0
MHT 301	Fluid Mechanics I	3.0
MET 408	MFG Information Management	3.0
MET 213	Applied Mechanics	4.0
	Term Credits	20.0

Winter

At Drexel

EET 401	Applied Microcontrollers	4.0
INDE 240	Technology Economics	3.0
MET 204	Applied Quality Control	3.0
MHT 226	Measurement Techniques and Instrumentation	3.0
PHIL 315	Engineering Ethics	3.0
	Term Credits	16.0

Spring

At Drexel

CO-OP

STAT 201	Introduction to Business Statistics	4.0
	Term Credits	4.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

EET 319	PLC Fundamentals	4.0
INDE 370	Industrial Project Management	3.0
MET 421 [WI]	Senior Design Project I	3.0
MHT 222	Applied Dynamics I	4.0
Technical Elective		3.0
	Term Credits	17.0

Winter

At Drexel

MET 407	Manufacturing Processes	3.0
MET 422	Senior Design Project II	3.0
MHT 314	Thermo and Heat Transfer Analysis	3.0
MHT 401	Mechanical Design I	4.0
Free Elective		3.0
	Term Credits	16.0

Spring

At Drexel

COM 111	Principles of Communication	3.0
EET 209	Fundamentals of Virtual Instrumentation	3.0
MET 423 [WI]	Senior Design Project III	3.0
Technical Elective		3.0
Free Elective		3.0
	Term Credits	15.0

Total Credit: 200.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BA in English

Drexel Degree Name: B.A. in English

Community College Degree Name: A.A in English

Sample Plan of Study - First & Second Year at Delaware County Community College

62 Credits at DCCC transfer over as 83-90 Credits at Drexel

Please contact the Department of English & Philosophy **(**https://drexel.edu/coas/academics/departments-centers/english-philosophy/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
Math Course (DCCC= MAT 120, 121, 135, 151, 152, 160, 210 [3-4])		3.0-4.0
COM 101 or 230	Human Communication (DCCC= COMM 100 or COMM 111 [3]) Techniques of Speaking	3.0
INFO 101 or CS 161	Introduction to Computing and Security Technology (DCCC= DPR 100 or DPR 101 [3]) Introduction to Computing	3.0
History Elective (DCCC= HIST Elective [3])		4.0
	Term Credits	16.0-17.0

Spring

At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
English Elective (DCCC= ENG 115 [3])		3.0
MATH Elective (DCCC= MAT Course 120 or Higher [3-4])		3.0-4.0
HIST Elective (DCCC= HIS Elective [3])		4.0
Transfer Science Elective (DCCC= Natural Science not PHY 100 or PHY 107[4])		4.0
	Term Credits	20.0-21.0

Second Year

Fall

At Community College		
ENGL 211 [WI] or 212	British Literature I (DCCC= ENG 220 or ENG 221 [3]) British Literature II	3.0
ENGL 325	Topics in World Literature (DCCC= ENG 240 or ENG 241 [3])	3.0
Transfer Science Elective (DCCC= Any Natural Science Laboratory Course[4])		4.0
Social Science Elective (DCCC= Social Science Elective [3])		3.0
English Elective (DCCC= English Elective [3])		3.0
	Term Credits	16.0

Spring

At Community College		
ENGL 205 [WI] or 206 [WI]	American Literature I (DCCC= ENG 230 or ENG 231 [3]) American Literature II	3.0
English Elective (DCCC= English Elective [3])		3.0
Foreign Language Requirement (DCCC=*Take foreign language for Humanities [3])		4.0
Social and Behavioral Science (DCCC= Social Science Elective [3])		3.0
Humanities Elective (DCCC=*Not ENGL or LIT Humanities Elective [3])		3.0
Excess free elective credits from semester to Drexel credits		15.0-20.0
	Term Credits	31.0-36.0

Third Year

Fall

At Drexel		
Foreign Language Course 103		4.0
English Elective 200-216		3.0
Science & Technology in the Humanities		3.0
Free Elective		3.0
COOP 101	Career Management and Professional Development	0.0
	Term Credits	13.0

Winter

At Drexel		
Foreign Language Course		4.0
ENGL 212	British Literature II	3.0
Creative & Professional Writing Course		3.0
English Elective 310-335		3.0
	Term Credits	13.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
International Studies Elective		4.0
ENGL 490	Seminar in English and American Literature	4.0
Creative & Professional Writing Course		3.0
English Elective 305-381		3.0
	Term Credits	14.0

Winter

At Drexel		
Diversity Studies Elective		4.0
ENGL 492	Seminar in World Literature	4.0
ENGL 380	Literary Theory	3.0
Science & Technology in the Humanities		3.0
	Term Credits	14.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel		
International Studies Elective		4.0
ENGL 315 [WI]	Shakespeare	3.0
English Elective 305-381		3.0
Creative & Professional Writing Course		3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
	Term Credits	14.0

Winter

At Drexel		
Diversity Studies Elective		3.0
Creative & Professional Writing Course		3.0
Science & Technology in the Humanities		3.0

English Elective 310-335		3.0
Free Elective		3.0
	Term Credits	15.0
Spring		
At Drexel		
ENGL 495	Senior Project in Literature	3.0
Creative & Professional Writing Course		3.0
English Elective 305-381		3.0
Science & Technology in the Humanities		3.0
Free Elective		3.0
	Term Credits	15.0

Total Credit: 181.0-188.0

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BA in Entrepreneurship and Innovation

Drexel Degree Name: B.A in Entrepreneurship and Innovation

Community College Degree Name: A.A in Liberal Arts

Sample Plan of Study - First & Second Year at Delaware County Community College

61 Credits at DCCC transfers over as 65-70 credits at Drexel

Please contact the Close School of Entrepreneurship **(**https://drexel.edu/close/academics/undergraduate/BA-entrepreneurship-innovation/**) for the most current Plan of Study.**

First Year

Fall		**Credits**
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
MATH 100	Fundamentals of Mathematics (DCCC= MAT 120 [3])	3.0
COM 230	Techniques of Speaking (DCCC= COMM 111 [3])	3.0
Technology course (DCCC= DPSR 108 or DPSR 104 or DPSR 110 [3])		3.0
Social/Behavioral Elective (DCCC= History Elective [3])		3.0
	Term Credits	15.0

Spring		
At Community College		
ECON 201	Principles of Microeconomics (DCCC=ECO 220 [3])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	3.0-6.0

Science Requirement (DCCC= Natural Science Elective with Lab (CHEM, BIO, GEO, PHYS [4])		3.0-4.0
Social/Behavioral Science (DCCC= PSY 140 or SOC 110 [3])		3.0
Free Elective (DCCC= Global Understanding designated History course [3])		3.0
	Term Credits	16.0-20.0

Second Year

Fall

At Community College		
MATH 101	Introduction to Analysis I (DCCC= MAT 121-MAT 261 [4])	4.0
Any foreign language at 101 level (DCCC= any foreign language at 101 [4])		4.0
Humanities/Fine Arts (DCCC= Humanities elective [3])		3.0
Free elective (DCCC=Social Science Elective [3])		3.0
Free elective (DCCC= PSY 225 or SOC 215 [3])		3.0
	Term Credits	17.0

Spring

At Community College		
ACCT 120	Accounting Essentials for New Ventures (DCCC= ACC 111 [3])	4.0
COM 270 [WI]	Business Communication (DCCC= BUS 130 [3])	3.0
Foreign language at 102 level (DCCC= any foreign language at 102 level [4])		4.0
Humanities /Fine Arts (DCCC= any Humanities elective [3])		3.0
Science Requirement (DCCC= Natural Science Elective with Lab (CHEM, BIO, GEO, PHYS [4])		3.0-4.0
	Term Credits	17.0-18.0

Third Year

Fall

At Drexel		
ENTP 100	Innovation Ecosystem	1.0
ENTP 105	Entrepreneurship Practice & Mindset	3.0
ENTP 250	Ideation	3.0
ENTP 225 [WI]	Mindfulness & Wellbeing	3.0
Required minor course		3.0
Free elective		3.0
	Term Credits	16.0

Winter

At Drexel		
CIVC 101	Introduction to Civic Engagement	1.0
ENTP 101	Life Strategies I	3.0
ENTP 205	Ready, Set, Fail	3.0
PHIL 105	Critical Reasoning	3.0
Entrepreneurship Elective		3.0
Required minor course		3.0
	Term Credits	16.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
BLAW 346	Entrepreneurial Law	4.0
MKTG 201	Introduction to Marketing Management	4.0
Concentration requirement		3.0
Entrepreneurship elective		3.0
Required minor course		3.0
	Term Credits	17.0

Winter

At Drexel		
Ethics Requirement		3.0
Technology Requirement		3.0
Required minor course		3.0
Entrepreneurship elective		3.0
Fine Arts/Humanities course		3.0
Concentration requirement		3.0
	Term Credits	18.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
ENTP 410 [WI]	Thought Leadership	3.0
Required minor courses		6.0
Concentration requirement		3.0
Ethics course		3.0
	Term Credits	15.0
Winter		
At Drexel		
Concentration requirement		3.0
Required minor course		3.0
Entrepreneurship elective		3.0
Fine Arts/Humanities course		3.0
Free elective		3.0
	Term Credits	15.0
Spring		
ENTP 215	Building Entrepreneurial Teams	3.0
Required minor course		3.0
Free Electives		9.0
Entrepreneurship elective		3.0
	Term Credits	18.0

Total Credit: 180.0-185.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses

with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Environmental Engineering

Drexel Degree Name: B.S in Environmental Engineering

Community College Degree Name: A.S. in Engineering

Sample Plan of Study - First & Second Year at Delaware County Community College

76 Credits at DCCC transfer over as 90 Credits at Drexel

Please contact the Department of Civil, Architectural and Environmental Engineering **(**https://drexel.edu/engineering/academics/departments/civil-architectural-environmental-engineering/**) for the most current Plan of Study.**

First Year		
Fall		**Credits**
At Community College		
CHEM 101	General Chemistry I (DCCC= CHE 110 [4])	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis (DCCC = DPR 101[3])	3.0
MATH 121	Calculus I (DCCC= MAT 160 [4])	4.0
General Education Elective (DCCC= Social Science Elective [3])		4.5
	Term Credits	18.0
Spring		
At Community College		
CHEM 102	General Chemistry II (DCCC= CHE 111 [4])	4.5
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
MATH 122 & MATH 123	Calculus II (DCCC= MAT 161 [4])	8.0
PHYS 101	Fundamentals of Physics I (DCCC= PHY 131 [4])	4.0
Free Elective (DCCC= EGR 150 [1])		1.0
	Term Credits	23.5
Summer		
At Community College		

BIO 141	Essential Biology (DCCC= BIO 100 or 110 [4])	4.5
	Term Credits	4.5

Second Year

Fall

At Community College

MATH 200	Multivariate Calculus (DCCC= MAT 260 [3])	4.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (DCCC= PHY 132 [4])	8.0
CHEM 241	Organic Chemistry I (DCCC= CHE 200 [5])	4.0
General Education Elective (DCCC= Social Science Elective [4])		4.5
General Education Elective (DCCC= Social Science Elective [3])		4.5
	Term Credits	25.0

Spring

At Community College

CHEM 242	Organic Chemistry II (DCCC= CHE 201 [5])	4.0
MATH 261	Linear Algebra (DCCC= MAT 200 [3])	3.0
MATH 262 or ENGR 232	Differential Equations (DCCC= MAT 261 [3]) Dynamic Engineering Systems	3.0
General Education Elective (DCCC= COM 100 or 111 [3])		
General Education Elective (DCCC= Social Science Elective [3])		4.5
General Education Elective (DCCC= Humanities Elective [3])		4.5
	Term Credits	19.0

Third Year

Fall

At Drexel

CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
CHEM 230	Quantitative Analysis	4.0
CHEM 231 [WI]	Quantitative Analysis Laboratory	2.0
ENGR 113	First-Year Engineering Design	3.0
ENGR 220	Fundamentals of Materials	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	17.0

Winter

At Drexel

BIO 220	Essential Microbiology	3.0
CAEE 203	System Balances and Design in CAEE	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 210	Introduction to Thermodynamics	3.0
ENVS 230	General Ecology	3.0
PHIL 315	Engineering Ethics	3.0
	Term Credits	16.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fourth Year

Fall

At Drexel

CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
CHE 211	Material and Energy Balances I	4.0
CIVE 240 [WI]	Engineering Economic Analysis	3.0
CIVE 320	Introduction to Fluid Flow	3.0
ENVE 300	Introduction to Environmental Engineering	3.0
	Term Credits	17.0

Winter

At Drexel

CIVE 330	Hydraulics	4.0

ENVE 302	Environmental Transport and Kinetics	3.0
ENVE 410	Solid and Hazardous Waste	3.0
Tech Elective		3.0
	Term Credits	13.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

CIVE 430	Hydrology	3.0
ENVE 465	Indoor Air Quality	3.0
ENVE 485	Professional Environmental Engineering Practice	1.0
ENVE 491 [WI]	Senior Project Design I	3.0
ENVS 401	Chemistry of the Environment	3.0
Tech Elective		3.0
	Term Credits	16.0

Winter

At Drexel

CIVE 431	Hydrology-Ground Water	3.0
ENVE 421	Water and Waste Treatment II	3.0
ENVE 486	Environmental Engineering Processes Laboratory I	2.0
ENVE 492 [WI]	Senior Design Project II	3.0
Tech Elective		3.0
	Term Credits	14.0

Spring

At Drexel

CAEE 361	Statistical Analysis of Engineering Systems	3.0
ENVE 422	Water and Waste Treatment Design	3.0
ENVE 435	Groundwater Remediation	3.0
ENVE 487	Environmental Engineering Processes Laboratory II	2.0
ENVE 493 [WI]	Senior Design Project III	3.0
Tech Elective		3.0
	Term Credits	17.0

Total Credit: 200.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses

with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in General Studies

Drexel Degree Name: B.S. in General Studies

Community College Degree Name: A.A. in Liberal Arts

Sample Plan of Study - First & Second Year at Delaware County Community College

64 Credits at DCCC transfer over as 90 Credits at Drexel

Please contact the Goodwin College of Professional Studies **(**https://drexel.edu/goodwin/academics/degree-completion-programs/transfer-credit-apl/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3])	3.0
MATH 100	Fundamentals of Mathematics (DCCC= MAT 120 [3])	3.0
COM 230	Techniques of Speaking (DCCC= COMM 100 [3])	3.0
Transfer Humanities Elective (DCCC= Humanities Elective [3])		4.5
Transfer Humanities Elective (DCCC= History Elective [3])		4.5
	Term Credits	18.0

Spring

At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
Transfer Humanities Elective (DCCC= Humanities Elective [3])		4.5
Transfer Humanities Elective (DCCC= Social Science Elective [3])		4.5
Transfer Science Elective (DCCC= Natural Science Elective with Lab [4])		6.0
Transfer Humanities Elective (DCCC= History Elective [3])		4.5
	Term Credits	25.5

Second Year

Fall

At Community College		
Transfer Humanities Elective (DCCC= Humanities Elective [6])		9.0
Transfer Science Elective (DCCC= MAT/Natural Science Elective [3-4])		4.5-6.0
Transfer Humanities Elective (DCCC= Social Science Elective [6])		9.0
Transfer Free Elective (DCCC= Open Elective [3])		4.5
	Term Credits	27.0-28.5

Spring

At Community College		
Transfer Humanities Elective (DCCC= Social Science Elective [6])		9.0
Transfer Humanities Elective (DCCC= Humanities Elective [3])		3.0
Transfer Free Elective (DCCC= Open Electives [6])		6.0
	Term Credits	18.0

Third Year

Fall

At Drexel		
GSTD 200	Lifelong Learning Theory & Practice	3.0
MATH 171	Introduction to Analysis A	3.0
Free Elective		3.0
Free Elective - Upper Level		4.0
Free Elective		3.0
COOP 101	Career Management and Professional Development	0.0
	Term Credits	16.0

Winter

At Drexel		
GSTD 201 [WI]	Professional Applications of Emotional Intelligence	3.0
PRST 211	Computer Applications for Professionals	3.0
Free Elective		4.0
Free Elective		3.0
Free Elective - Upper Level		3.0
	Term Credits	16.0

Spring

At Drexel		
COOP EXPERIENCE		
	Term Credits	0.0

Summer

At Drexel		
COOP EXPERIENCE		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
GSTD 303	Client Relations Management	3.0
Specializaion		3.0
Free Elective [WI]		3.0
Specialization - Upper Level		3.0
Specialization		3.0
	Term Credits	15.0

Winter

At Drexel		
PRST 303	Interpersonal Skills for Virtual Teams	3.0
Specialization		3.0
Specialization - Upper Level		3.0
Free Elective		3.0
Specialization - Upper Level		3.0
	Term Credits	15.0

Spring

At Drexel		
COOP EXPERIENCE		
	Term Credits	0.0

Summer

At Drexel		
COOP EXPERIENCE		
	Term Credits	0.0

Fifth Year

Fall

At Drexel		
GSTD 491	Senior Project in General Studies	3.0

Specialization - Upper Level		3.0
Specialization - Upper Level		3.0
Specialization		3.0
Specialization		3.0
Term Credits		15.0
Winter		
At Drexel		
Specialization		3.0
Free Elective - Upper Level		3.0
Free Elective - Writing Intensive		3.0
Free Elective - Upper Level		4.0
Term Credits		13.0

Total Credit: 178.5-180.0

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

BA in Global Studies

Drexel Degree Name: B.A. Global Studies

Community College Degree Name: A.A in Global Studies

Sample Plan of Study - First & Second Year at Delaware County Community College

61 Credits at DCCC transfer over as 89-90 Credits at Drexel

Please contact the Department of **(**https://drexel.edu/coas/academics/departments-centers/global-studies-modern-languages/**)** Global Studies & Modern Languages **(**https://drexel.edu/coas/academics/departments-centers/global-studies-modern-languages/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
MATH Elective (DCCC= Pick One; MAT 120, 121, 135, 151, 152, 160 [3-4])		3.0-4.0
HIST 161	Themes in World Civilization I (DCCC= HIST 150 [3])	4.0
COM 222	Interpersonal Communication (DCCC = *take COM 100 [3])	3.0
CS 161	Introduction to Computing (DCCC = *take DPR 101 [3]	3.0
Term Credits		16.0-17.0

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
PSCI 150	International Politics (DCCC= POL 200 [3])	4.0
HIST 162 & HIST 163	Themes in World Civilization II (DCCC= HIS 160 [3])	8.0
SOC 101 or PSY 101	Introduction to Sociology (DCCC= SOC 110 or PSY 140 [3]) General Psychology I	3.0
Science Course (DCCC= Scientific Inquiry Course [4])		4.0
Term Credits		25.0

Second Year

Fall		
At Community College		
COM 345	Intercultural Communication (DCCC=COM 102 [3])	3.0
ECON 202	Principles of Macroeconomics (DCCC=*take ECO 210 Business Elective [3]	4.0
ANTH 117	Introduction to World Religions (DCCC=HUM 160 [3])	3.0
SOC 210	Race, Ethnicity and Social Inequality (DCCC=*take SOC 215 [3])	4.0
Foreign Language (DCCC= Foreign Language Elective [3])		4.0
Term Credits		18.0

Spring		
At Community College		
ARTH 101	History of Art I: Ancient to Medieval (DCCC = ART 111[3])	3.0
INTB 200	International Business (DCCC = BUS 101 [3])	4.0
Foreign Language (DCCC= Foreign Language Elective [3])		4.0
Free Electives (DCCC=*take ART 110, ART 112 or MUS 115 Humanities Elective [3])		3.0
Free Elective (DCCC = Open Elective [3])		3.0

Excess free elective credits from semester to Drexel credits		13.0
	Term Credits	30.0
Third Year		
Fall		
At Drexel		
GST 101	Becoming Global: Language and Cultural Context	3.0
Foreign Language		4.0
Math Course		4.0
ECON 201	Principles of Microeconomics	4.0
COOP 101	Career Management and Professional Development	0.0
Free elective		3.0
	Term Credits	18.0
Winter		
At Drexel		
GST 102	Understanding Global: Markets and Governance	3.0
Foreign Language		4.0
Science Elective		3.0
Free Elective		3.0
Core Concentration Course		3.0
	Term Credits	16.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fourth Year		
Fall		
At Drexel		
Core Concentration Course		3.0
Foreign Language		4.0
Concentration Distribution Course		3.0
Core Concentration Course		3.0
undefined		3.0
	Term Credits	16.0
Winter		
At Drexel		
Core Concentration Course		3.0
Foreign Language		4.0
Concentration Distribution Course		3.0
Concentration Distribution Course		3.0
GST 200+ level course		3.0
	Term Credits	16.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
Foreign Language		4.0
GST 200+ Level Course		3.0
Core Concentration Course		3.0
Concentration Distribution Course		3.0

UNIV H201	Looking Forward: Academics and Careers	1.0
	Term Credits	14.0
Winter		
At Drexel		
Concentration Distribution Course		3.0
Core Concentration Course		3.0
GST 400		3.0
Foreign Language		3.0
	Term Credits	12.0
Spring		
At Drexel		
Foreign Language		3.0
Concentration Distribution Course		3.0
Free Elective		3.0
Concentration Distribution Option		3.0
	Term Credits	12.0

Total Credit: 193.0-194.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BA in History

Drexel Degree Name: B.A. History

Community College Degree Name: A.A in History

Sample Plan of Study - First & Second Year at Delaware County Community College

58 Credits at DCCC transfer over as 81.5-89.5 Credits at Drexel

Please contact the Department of History **(**https://drexel.edu/coas/academics/departments-centers/history/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
HIST 201	United States History to 1815 (DCCC= HIS 110 [3])	4.0
PSCI 110	American Government (DCCC= POL 120 [3])	4.0
PSY 101 or SOC 101	General Psychology I (DCCC= PSY 140 or SOC 110 [3]) Introduction to Sociology	3.0
MATH T280	Special Topics in Mathematics (DCCC= Any Transferrable Quantitative Reasoning designated MAT Course MAT 120 or higher, NOT MAT 125/128/135 [3])	3.0-4.0
	Term Credits	17.0-18.0

Spring

At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
HIST 202 & HIST 203	United States History, 1815-1900 (DCCC= HIST 120 [3])	8.0
COM 230	Techniques of Speaking (DCCC= COMM 111 [3])	3.0
Transfer Social Science (DCCC= Social Science Elective [3])		3.0-4.0
CS 161	Introduction to Computing (DCCC= Any Transferable Technology designated course [3])	3.0
	Term Credits	23.0-24.0

Second Year

Fall

At Community College		
HIST 161	Themes in World Civilization I (DCCC= HIS 150 [3])	4.0
ECON 201	Principles of Microeconomics (DCCC= ECO 220 [3])	4.0
Natural Science elective (DCCC= Any transferable Scientific Inquiry designated course [4])		3.0-4.0
Fine Arts & Humanities (DCCC= Humanities Elective [3])		3.0
Foreign Language (DCCC= Foreign Language Elective [3])		4.0
	Term Credits	18.0-19.0

Spring

At Community College		
HIST 162 & HIST 163	Themes in World Civilization II (DCCC= HIS 160 [3])	8.0
Fine Arts & Humanities (DCCC= Humanities Elective [3])		3.0
Social Science elective (DCCC= Social Science Elective [3])		3.0-4.0
Free Elective (DCCC= *Take foreign language [3])		4.0
Excess free elective credits from semester to Drexel credits		5.5-9.5
	Term Credits	23.5-28.5

Third Year

Fall

At Drexel		
COOP 101	Career Management and Professional Development	0.0
HIST 296	Research Methods in History I	4.0
Foreign Language		4.0
History Pre-1700		4.0
History Elective		4.0
	Term Credits	16.0

Winter

At Drexel		
HIST T380	Special Topics in History	4.0
Foreign Language		4.0
History Elective		4.0
History Non-US		4.0
	Term Credits	16.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
HIST 301	The Study of History	4.0
Foreign Language		4.0
History/Science/Tech/Enviro Elective		4.0
History Elective		4.0
	Term Credits	16.0

Winter

At Drexel		
HIST 396	Research Methods in History II	4.0
Humanities		3.0
History Elective		4.0
Free Elective		3.0
	Term Credits	14.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel		
HIST 490 [WI]	Senior Seminar I	4.0
History Non-US		4.0
History Elective		4.0
History Elective		4.0
	Term Credits	16.0

Winter

At Drexel		
HIST 491 [WI]	Senior Seminar II	4.0
Diversity		3.0
International Studies		3.0

Free Elective		3.0
	Term Credits	13.0
Spring		
At Drexel		
History Elective		4.0
Diversity Elective		3.0
Humanities/Fine Arts Elective		3.0
Free Elective		3.0
	Term Credits	13.0

Total Credit: 185.5-193.5

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Hospitality Management

Drexel Degree Name: B.S. Hospitality Management

Community College Degree Name: A.A.S in Hotel and Restaurant Management

Sample Plan of Study - First & Second Year at Delaware County Community College

60 Credits at DCCC transfer over as 74 Credits at Drexel

* Note: File is still Pending Updates; Students need 183 credits to graduate with a B.S degree

Please contact the Department of Food and Hospitality Management **(**https://drexel.edu/cnhp/academics/departments/food-hospitality-management/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
FDSC 270	Microbial Food Safety and Sanitation (DCCC= HRM 110 [3])	4.0
HRM 110	Introduction to the Hospitality Industry (DCCC= HRM 100 [3])	3.0
INFO 101	Introduction to Computing and Security Technology (DCCC= DPR 100 [3])	3.0
MATH 181	Mathematical Analysis I (DCCC= MAT 135 [3])	3.0
	Term Credits	16.0

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC- ENG 112 [3])	6.0
ACCT 110	Accounting for Professionals (DCCC= ACC 100 [3])	4.0
SOC 101 or PSY 101	Introduction to Sociology (DCCC= SOC 110 or PSY 140 [3]) General Psychology I	3.0
HRM 125	Hotel Operations Management (DCCC= HRM 155 [3])	3.0
HRM 160	Laws of the Hospitality Industry (DCCC= HRM 162 [3])	3.0
	Term Credits	19.0

Second Year

Fall		
At Community College		
HRM 330	Hospitality Marketing and Branding (DCCC= HRM 145 [3])	3.0
HRM 120	Principles of Food-Service Management (DCCC= HRM 253 [3])	3.0
Free Elective (DCCC= HRM or CUL Elective [6])		9.0
Free Elective (DCCC= Science Elective [3])		4.5
	Term Credits	19.5

Spring		
At Community College		
HRM 455	Hospitality Human Resources Management (DCCC= HRM 165 or BUS 215 [3])	3.0
HRM 165	Introduction to the Events Industry (DCCC= HRM 254 [3])	3.0
Free Elective (DCCC= HRM 199 or CUL or HRM Electives [6])		9.0

Free Elective (DCCC= Humanities Elective [3])		4.5
	Term Credits	19.5

Third Year
Fall
    At Drexel

CULA 115	Culinary Fundamentals	3.0
FDSC 100	ServSafe	1.0
HRM 130	Introduction to Tourism	3.0
HRM 155	Hotel Customer Service	3.0
MIS 200	Management Information Systems	4.0
MATH 107	Probability and Statistics for Liberal Arts	3.0
	Term Credits	17.0

Winter
    At Drexel

HRM 131	Tourism Geography	3.0
HRM 150	Food & Beverage Customer Service	3.0
ECON 201	Principles of Microeconomics	4.0
Language		4.0
MATH 182	Mathematical Analysis II	3.0
HRM 190	Industry Hours I	1.0
	Term Credits	18.0

Spring
    At Drexel
CO-OP

	Term Credits	0.0

Summer
    At Drexel
CO-OP

	Term Credits	0.0

Fourth Year
Fall
    At Drexel

Language		4.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
MKTG 201	Introduction to Marketing Management	4.0
HRM 290	Industry Hours II	1.0
COM 181	Public Relations Principles and Theory	3.0
	Term Credits	15.0

Winter
    At Drexel

Language		4.0
COM 230	Techniques of Speaking	3.0
HRM 390	Industry Hours III	1.0
HRM 425	Hospitality Industry Administration	3.0
HRM 215	Commercial Food Production	4.0
	Term Credits	15.0

Spring
    At Drexel
CO-OP

	Term Credits	0.0

Summer
    At Drexel
CO-OP

	Term Credits	0.0

Fifth Year
Fall
    At Drexel

Arts and Humanities		3.0
COM 270 [WI]	Business Communication	3.0
HRM 490	Industry Hours IV	1.0

HRM 370	Gaming and Casino Management I	3.0
HRM 355	Resort Management	3.0
Business		4.0
	Term Credits	17.0

Winter
    At Drexel

HRM 495	Industry Hours V	1.0
HRM 335	Beverage Management	3.0
HRM 371	Gaming and Casino Management II	3.0
HRM 450	Hospitality Leadership Seminar	3.0
ORGB 300 [WI]	Organizational Behavior	4.0
	Term Credits	14.0

Total Credit: 170.0

Writing-Intensive Course Requirements

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Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Materials Science and Engineering

Drexel Degree Name: B.S in Materials Science and Engineering

Community College Degree Name: A.S in Engineering

Sample Plan of Study - First & Second Year at Delaware County Community College

61 Credits at DCCC transfer over as 83.5 Credits at Drexel

Please contact the Department of Materials Science and Engineering **(**https://drexel.edu/engineering/academics/departments/materials-science-engineering/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
CHEM 101	General Chemistry I (DCCC= CHE 110 [4])	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis (DCCC= DPR 110 [3])	3.0
MATH 121	Calculus I (DCCC= MAT 160 [4])	4.0
General Education Elective (DCCC= Social Science Elective [3])		4.5
	Term Credits	18.0

Spring

At Community College		
CHEM 102	General Chemistry II (DCCC= CHE 111 [4])	4.5
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
MATH 122 & MATH 123	Calculus II (DCCC= MAT 161 [4])	8.0
PHYS 101	Fundamentals of Physics I (DCCC= PHY 131 [4])	4.0
Free Elective (DCCC= EGR 150 [1])		1.5
	Term Credits	24.0

Second Year

Fall

At Community College		
ECON 201	Principles of Microeconomics (DCCC= ECO 210 [3])	4.0
MATH 200	Multivariate Calculus (DCCC= MAT 260 [3])	4.0
MATH 201 or ENGR 231	Linear Algebra (DCCC= MAT 200 [3]) Linear Engineering Systems	4.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (DCCC= PHY 132 [4])	8.0
General Education Elective (DCCC= Social Science Elective [3])		4.5
	Term Credits	24.5

Spring

At Community College		
ECON 202	Principles of Macroeconomics (DCCC= ECO 220 [3])	4.0
MATH 210 or ENGR 232	Differential Equations (DCCC= MAT 261 [3]) Dynamic Engineering Systems	4.0
General Education Elective (DCCC= COM 100 or 111 [3])		4.5

General Education Elective (DCCC= Humanities Elective [3])		4.5
	Term Credits	17.0

Third Year

Fall

At Drexel		
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
COOP 101	Career Management and Professional Development	0.0
ENGR 113	First-Year Engineering Design	3.0
ENGR 220	Fundamentals of Materials	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	12.0

Winter

At Drexel		
CHEM 241	Organic Chemistry I	4.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 131	Introductory Programming for Engineers	3.0
ENGR 210	Introduction to Thermodynamics	3.0
MATE 230	Fundamentals of Materials II	4.0
	Term Credits	15.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
MATE 214	Introduction to Polymers	4.0
MATE 240	Thermodynamics of Materials	4.0
MATE 355	Structure and Characterization of Crystalline Materials	3.0
MATE 370	Mechanical Behavior of Solids	3.0
	Term Credits	14.0

Winter

At Drexel		
MATE 245	Kinetics of Materials	4.0
MATE 315	Processing Polymers	3.0
MATE 341	Defects in Solids	3.0
PHIL 315	Engineering Ethics	3.0
	Term Credits	13.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel		
MATE 280	Advanced Materials Laboratory	4.0
MATE 366 [WI]	Processing of Metallic Materials	4.5
MATE 455	Biomedical Materials	3.0
Tech Elective/Track #1		3.0
	Term Credits	14.5

Winter

At Drexel		

CHEC 353	Physical Chemistry and Applications III	4.0
MATE 345	Processing of Ceramics	4.5
MATE 351	Electronic and Photonic Properties of Materials	4.0
	Term Credits	12.5
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Sixth Year		
Fall		
At Drexel		
CHE 350	Statistics and Design of Experiments	3.0
MATE 460	Engineering Computational Laboratory	4.0
MATE 491 [WI]	Senior Project Design I	2.0
Tech. Elective/Track #2		3.0
	Term Credits	12.0
Winter		
At Drexel		
MATE 492	Senior Project Design II	3.0
Tech. Elective/Track #3		3.0
	Term Credits	6.0
Spring		
At Drexel		
MATE 410	Case Studies in Materials	3.0
MATE 493 [WI]	Senior Project Design III	3.0
Tech Elective/Track #4		3.0
	Term Credits	9.0

Total Credit: 191.5

Writing-Intensive Course Requirements

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Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Mathematics

Drexel Degree Name: B.S. Mathematics

Community College Degree Name: A.S in Mathematics/Natural Science

Sample Plan of Study - First & Second Year at Delaware County Community College

63 Credits at DCCC transfers over as 87.5-90 Credits at Drexel

Please contact the Department of Mathematics (https://drexel.edu/coas/academics/departments-centers/mathematics/) for the most current Plan of Study.

First Year		
Fall		**Credits**
At Community College		
BIO 107 & BIO 108	Cells, Genetics & Physiology (DCCC= *take BIO 110 [4])	4.0
CS 164	Introduction to Computer Science (DCCC = *take DPR 101 [3])	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
MATH 121	Calculus I (DCCC = *take MAT 160 [4])	4.0
Social Science Elective (Diversity and Social Justice designated Social Science course [3])		3.0
	Term Credits	17.0
Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
MATH 122 & MATH 123	Calculus II (DCCC = *take MATH161 [4])	8.0
PHYS Course (DCCC= *take PHY 110 [4] or PHY 131[4])		4.0
Humanities Elective (DCCC = Global Understanding designated Humanities Course [3])		3.0
Social Science Elective (DCCC = Social Science Elective [3])		3.0-4.0
	Term Credits	24.0-25.0
Second Year		
Fall		
At Community College		
COM 230	Techniques of Speaking (DCCC= *take COMM 111 [3])	3.0
MATH 200	Multivariate Calculus (DCCC = MAT 260 [4])	4.0
CHEM course (DCCC= *take CHE 101 [4] or CHE 110 [4])		3.5-5.0
Social science (DCCC = Social Science Elective [3])		3.0
Free Elective (DCCC= Open Elective [3])		3.0
	Term Credits	16.5-18.0
Spring		
At Community College		
MATH 201	Linear Algebra (DCCC = *take MATH 200 [3])	4.0
MATH 210	Differential Equations (DCCC = *take MATH 261 [3])	4.0

Free Electives (Open Electives [6-8])		6.0
Excess free elective credits from semester to Drexel credits		16.0
	Term Credits	30.0
Third Year		
Fall		
At Drexel		
MATH 220 [WI]	Introduction to Mathematical Reasoning	3.0
COOP 101	Career Management and Professional Development	0.0
CS 171	Computer Programming I	3.0
MATH Elective		4.0
International Studies/Diversity Elective		3.0
Social Sciences Elective		3.0
	Term Credits	16.0
Winter		
At Drexel		
CS 172	Computer Programming II	3.0
MATH Electives		6.0
Free electives		3.0
	Term Credits	12.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fourth Year		
Fall		
At Drexel		
MATH 331	Abstract Algebra I	4.0
MATH Elective		6.0
Humanities Elective		3.0
	Term Credits	13.0
Winter		
At Drexel		
MATH 332	Abstract Algebra II	3.0
UNIV S201	Looking Forward: Academics and Careers	1.0
MATH Elective		6.0
Social Science Elective		3.0
Social Science Elective		3.0
	Term Credits	16.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
MATH 401	Elements of Modern Analysis I	3.0
MATH Elective		4.0
Free Elective		6.0
	Term Credits	13.0
Winter		
At Drexel		
MATH 402	Elements of Modern Analysis II	3.0
MATH Electives		7.0

International/Diversity Elective		3.0
	Term Credits	13.0
Spring		
At Drexel		
MATH Elective		7.0
Free Electives		5.0
	Term Credits	12.0

Total Credit: 182.5-185.0

Writing-Intensive Course Requirements

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Transfer Credits
Transfer Credits

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BS in Mechanical Engineering

Drexel Degree Name: B.S in Mechanical Engineering

Community College Degree Name: A.S in Mechanical Engineering

Sample Plan of Study - First & Second Year at Delaware County Community College

64 Credits at DCCC transfer over as 82.5 Credits at Drexel

Please contact the Department of Mechanical Engineering and Mechanics **(**https://drexel.edu/engineering/academics/departments/mechanical-engineering/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
CHEM 101	General Chemistry I (DCCC= CHE 110 [4])	3.5
CS 190	Selected Computer Language (DCCC= DPR 101 [3])	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC= ENG 100 [3]) English Composition I	3.0
MATH 121	Calculus I (DCCC= MAT 160 [4])	4.0
General Education Elective (DCCC= Social Science Elective [3])		4.5
	Term Credits	18.0

Spring

At Community College		
CHEM 102	General Chemistry II (DCCC= CHE 111 [4])	4.5
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC= ENG 112 [3])	6.0
ENGR 111[*]	Introduction to Engineering Design & Data Analysis (DCCC= EGR 150 [1])	3.0
MATH 122 & MATH 123	Calculus II (DCCC= MAT 161 [4])	8.0
PHYS 101	Fundamentals of Physics I (DCCC= PHY 131 [4])	4.0
	Term Credits	25.5

Second Year

Fall

At Community College		
MATH 200	Multivariate Calculus (DCCC= MAT 260 [3])	4.0
MEM 202	Statics (DCCC= EGR 201 [3])	3.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (DCCC= PHY 132 [4])	8.0
General Education Elective (DCCC= Social Science Elective [3])		3.0
General Education Elective (DCCC= Social Science Elective [3])		3.0
	Term Credits	21.0

Spring

At Community College		
MATH 210	Differential Equations (DCCC= MAT 261 [3])	4.0
MATH 201	Linear Algebra (DCCC= MAT 200 [3])	4.0
MEM 238	Dynamics (DCCC= EGR 202 [3])	4.0
General Education Elective (DCCC= Social Science Elective [3])		3.0
General Elective Elective (DCCC= Humanities Elective [3])		3.0
	Term Credits	18.0

Third Year

Fall

At Drexel		
COOP 101	Career Management and Professional Development	0.0
ENGR 113	First-Year Engineering Design	3.0
ENGR 220	Fundamentals of Materials	4.0
MEM 201	Foundations of Computer Aided Design	3.0
MEM 230	Mechanics of Materials I	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	15.0

Winter

At Drexel		
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 210	Introduction to Thermodynamics	3.0
MEM 220	Fluid Mechanics I	4.0
MEM 255	Introduction to Controls	4.0
MEM 331	Experimental Mechanics I	2.0
MEM 333	Mechanical Behavior of Materials	3.0
	Term Credits	17.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
MEM 310	Thermodynamic Analysis I	4.0
MEM 345	Heat Transfer	4.0
MEM 355	Performance Enhancement of Dynamic Systems	4.0
MEM 391	Introduction to Engineering Design Methods	1.0
MEM 435	Introduction to Computer-Aided Design and Manufacturing	4.0
MEM Fund Course		3.0
	Term Credits	20.0

Winter

At Drexel		
MEM 351	Dynamic Systems Laboratory I	2.0
MEM 361	Engineering Reliability	3.0
MEM Fund Course		6.0-8.0
	Term Credits	11.0-13.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel		
MEM 311	Thermal Fluid Science Laboratory	2.0
MEM 491 [WI]	Senior Design Project I	3.0
MEM Fund Course		3.0
MEM/COE Elective		3.0
MATH/SCI Elective		3.0
	Term Credits	14.0

Winter

At Drexel

Course	Title	Credits
HIST 285	Technology in Historical Perspective	4.0
MEM 492 [WI]	Senior Design Project II	3.0
MATH/SCI Elective		3.0
MEM/COE Elective		3.0
MEM Elective		3.0
	Term Credits	16.0

Spring

At Drexel

Course	Title	Credits
BIO 141	Essential Biology	4.5
CIVE 240 [WI]	Engineering Economic Analysis	3.0
MEM 493 [WI]	Senior Design Project III	3.0
PHIL 315	Engineering Ethics	3.0
MEM Elective		3.0
	Term Credits	16.5

Total Credit: 192.0-194.0

*   ENGR 111 along with DPR 101 = ENGR 111

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Sociology

Drexel Degree Name: B.S. Sociology

Community College Degree Name: A.S in Sociology

Sample Plan of Study - First & Second Year at Delaware County Community College

62 Credits at DCCC transfer over as 90 Credits at Drexel

Please contact the Department of Sociology **(**https://drexel.edu/coas/academics/departments-centers/sociology/**) for the most current Plan of Study.**

First Year

Fall

At Community College

Course	Title	Credits
SOC 101	Introduction to Sociology (DCCC=SOC 110 [3])	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (DCCC=ENG 100 [3]) English Composition I	3.0
HIST 161 or 162	Themes in World Civilization I (DCCC=HIS 150 or HIS 160 [3]) Themes in World Civilization II	4.0
Science Elective (DCCC pick one: BIO 100, 110, 150, CHE 101, 110 or PHY 110 [4])		4.0
Humanities Elective (DCCC Humanities Elective [3])		3.0
	Term Credits	17.0

Spring

At Community College

Course	Title	Credits
SOC 215, PSY T180, or SOC 210	Sociology of Work (DCCC=SOC 215, PSY 225 or SOC 219 [3]) Special Topics in Psychology Race, Ethnicity and Social Inequality	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (DCCC=ENG 112 [3])	6.0
ANTH 101	Introduction to Cultural Diversity (DCCC=SOC 210 [3])	3.0
MATH 107	Probability and Statistics for Liberal Arts (DCCC=MAT 121 [3])	3.0
Science Elective (DCCC=Lab Science Elective [4])		4.0
	Term Credits	20.0

Second Year

Fall

At Community College

Course	Title	Credits
PSY 101	General Psychology I (DCCC=PSY 140 [3])	3.0
HIST 161	Themes in World Civilization I (DCCC=HIS 150 [3])	4.0
SOC 115	Social Problems (DCCC=SOC 120 [3])	4.0
INFO 101 or CS 161	Introduction to Computing and Security Technology (DCCC=DPR 100 or DPR 101 [3]) Introduction to Computing	3.0
STAT 201	Introduction to Business Statistics (DCCC=MAT 210 [3])	4.0
	Term Credits	18.0

Spring

At Community College

Course	Title	Credits
SOC 220	Wealth and Power (DCCC=SOC 180 [3])	4.0
COM 230	Techniques of Speaking (DCCC=COMM 111 [3])	3.0
PSY 150	Introduction to Social Psychology (DCCC=SOC 220 [3])	3.0
Free Elective (DCCC=Open Elective [3])		3.0
Humanities Elective (DCCC Humanities Elective [3])		3.0
Excess Free Elective Credit (from semester to quarter conversion)		19.0
	Term Credits	35.0

Third Year

Fall

At Drexel

SOC 355 [WI]	Classical Social Theory	4.0
Research Design: Qualitative Methods		4.0
Foreign Language		4.0
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
	Term Credits	13.0

Winter

At Drexel

Sociology Elective	4.0
Research Design: Quantitative Methods	4.0
Foreign Language	4.0
Term Credits	12.0

Spring

At Drexel

CO-OP

Term Credits	0.0

Summer

At Drexel

CO-OP

Term Credits	0.0

Fourth Year

Fall

At Drexel

Foreign Language	4.0
Sociology Elective (300-level)	4.0
Humanities Elective	3.0
Free Elective	3.0
Term Credits	14.0

Winter

At Drexel

SOC 356 [WI]	Contemporary Social Theory	4.0
Sociology Elective (300-level)		4.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Foreign Language		4.0
	Term Credits	13.0

Spring

At Drexel

CO-OP

Term Credits	0.0

Summer

At Drexel

CO-OP

Term Credits	0.0

Fifth Year

Fall

At Drexel

Free Elective	3.0
Free Elective	3.0
Sociology Elective (300-level)	4.0
Diversity Elective	3.0
Term Credits	13.0

Winter

At Drexel

Sociology Elective (300-level)	4.0
Sociology Elective (400-level)	4.0
Free Elective	4.0
Free Elective	4.0
Term Credits	16.0

Spring

At Drexel

SOC 450	Capstone in Sociology	4.0
Sociology Elective		4.0
Free Elective		3.0
Free Elective		3.0
	Term Credits	14.0

Total Credit: 185.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

Montgomery County Community College

Degree Programs in the Close School of Entrepreneurship

Degree Programs in the College of Arts and Sciences

Degree Programs in the College of Business

Degree Programs in the College of Engineering

Degree Programs in the College of Nursing and Health Professions

Degree Programs in the Goodwin College of Professional Studies

Degree Programs in the School of Education

BS in Architectural Engineering, Mechanical Concentration

Drexel Degree Name: B.S in Architectural Engineering, Mechanical Concentration

Community College Degree Name: A.S. in Engineering

Sample Plan of Study - First & Second Year at Montgomery County Community College

60 Credits at MCCC transfer over as 69 Credits at Drexel

Please contact the Department of Civil, Architectural and Environmental Engineering **(**https://drexel.edu/engineering/academics/departments/civil-architectural-environmental-engineering/**) for the most current Plan of Study.**

First Year		
Fall		**Credits**
At Community College		
CS 190[*]	Selected Computer Language (MCCC = EGR 111[3])	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis (MCCC = ENGR 102 [3])	3.0
MATH 121	Calculus I (MCCC= MAT 190 [4])	4.0
PHYS 101	Fundamentals of Physics I (MCCC= PHY 151 [4])	4.0
	Term Credits	17.0
Spring		
At Community College		
MATH 122	Calculus II (MCCC= MAT 201 [4])	4.0
COM 230	Techniques of Speaking (MCCC= SPC 120 [3])	3.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 102 [3])	6.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (MCCC= PHY 152[4])	8.0
	Term Credits	21.0
Second Year		
Fall		
At Community College		
CHEM 101	General Chemistry I (MCCC= CHE 151 [4])	3.5
MATH 200	Multivariate Calculus (MCCC= MAT 202 [4])	4.0
MEM 202	Statics (MCCC= EGR 203 [3])	3.0
	Term Credits	10.5
Spring		
At Community College		
MEM 230	Mechanics of Materials I (MCCC= EGR 213 [3])	4.0
MATH 210[**]	Differential Equations (MCCC = MAT 223 [4]))	4.0
MATH 201[***]	Linear Algebra (MCCC = MAT 220[4])	4.0

MEM 238	Dynamics (MCCC= EGR 204 [3])	4.0
	Term Credits	16.0
Summer		
CHEM 102	General Chemistry II (MCCC= CHE 152 [4])	4.5
	Term Credits	4.5
Third Year		
Fall		
At Drexel		
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
CIVE 240 [WI]	Engineering Economic Analysis	3.0
COOP 101	Career Management and Professional Development	0.0
ENGR 113	First-Year Engineering Design	3.0
ENGR 220	Fundamentals of Materials	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	14.0
Winter		
At Drexel		
ARCH 191	Studio 1-AE	3.0
CAEE 203	System Balances and Design in CAEE	3.0
CIVC 101	Introduction to Civic Engagement	1.0
CIVE 250	Construction Materials	4.0
ENGR 210	Introduction to Thermodynamics	3.0
	Term Credits	14.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fourth Year		
Fall		
At Drexel		
AE 340	Architectural Illumination and Electrical Systems	3.0
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
ARCH 141	Architecture and Society I	3.0
ARCH 192	Studio 2-AE	3.0
CIVE 320	Introduction to Fluid Flow	3.0
General Education Elective		3.0
	Term Credits	19.0
Winter		
At Drexel		
AE 220	Introduction to HVAC	3.5
CIVE 330	Hydraulics	4.0
ARCH 142	Architecture and Society II	3.0
General Education Elective		3.0-6.0
	Term Credits	13.5-16.5
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
AE 390	Architectural Engineering Design I	4.0
ARCH 143	Architecture and Society III	3.0

CAEE 361	Statistical Analysis of Engineering Systems	3.0
CIVE 302	Structural Analysis I	4.0
MEM 345	Heat Transfer	4.0
	Term Credits	18.0
Winter		
At Drexel		
AE 391	Architectural Engineering Design II	4.0
CIVE 303	Structural Design I	3.0
Professional Elective		3.0
General Education Elective		3.0
	Term Credits	13.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Sixth Year		
Fall		
At Drexel		
CAE 491 [WI]	Senior Design Project I	3.0
AE 544	Building Envelope Systems	3.0
MEM 413	HVAC Loads	3.0
	Term Credits	9.0
Winter		
At Drexel		
CAE 492 [WI]	Senior Design Project II	3.0
MEM 414	HVAC Equipment	3.0
Professional Elective		3.0
General Education Elective		3.0
	Term Credits	12.0
Spring		
At Drexel		
CAE 493 [WI]	Senior Design Project III	3.0
AE 430	Control Systems for HVAC	3.0
BIO 141	Essential Biology	4.5
Professional Elective		3.0
	Term Credits	13.5

Total Credit: 195.0-198.0

*   CS 190 sub for ENGR 131 for non EE & CE majors

**   MATH 210 sub for ENGR 232

***   MATH 201 sub for ENGR 231

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Architectural Engineering, Structural Concentration

Drexel Degree Name: B.S in Architectural Engineering, Structural Concentration

Community College Degree Name: A.S. in Engineering

Sample Plan of Study - First & Second Year at Montgomery County Community College

68 Credits at MCCC transfer over as 79-80.5 Credits at Drexel

Please contact the Department of Civil, Architectural and Environmental Engineering **(**https://drexel.edu/engineering/academics/departments/civil-architectural-environmental-engineering/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
MATH 121	Calculus I (MCCC= MAT 190 [4])	4.0
PHYS 101	Fundamentals of Physics I (MCCC= PHY 151 [4])	4.0
ENGR 111	Introduction to Engineering Design & Data Analysis (MCCC = EGR 102 [3])	3.0
CS 190[*]	Selected Computer Language (MCCC = EGR 111 [3])	3.0
	Term Credits	17.0

Spring		
At Community College		
MATH 122	Calculus II (MCCC= MAT 201 [4])	4.0
COM 230	Techniques of Speaking (MCCC= SPC 120 [3])	3.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 102 [3])	6.0

PHYS 102 & PHYS 201	Fundamentals of Physics II (MCCC= PHY 152 [3])	8.0
	Term Credits	21.0

Second Year
Fall
At Community College

CHEM 101	General Chemistry I (MCCC= CHE 151 [4])	3.5
MATH 200	Multivariate Calculus (MCCC= MAT 202 [4])	4.0
MATH 201[**]	Linear Algebra (MCCC = MAT 220 [4])	4.0
MEM 202	Statics (MCCC= EGR 203 [3])	3.0
TGFE Free Elective (MCCC= Core Goal 10: Exercise & Health Science [2-3])		3.0-4.5
	Term Credits	17.5-19.0

Spring
At Community College

HIST 161	Themes in World Civilization I (MCCC= HIS 101 [4])	4.0
MATH 210[***]	Differential Equations (MCCC = MAT 223 [4])	4.0
MEM 230	Mechanics of Materials I (MCCC= EGR 213 [3])	4.0
MEM 238	Dynamics (MCCC= EGR 204 [3])	4.0
PHIL 251	Ethics (MCCC= PHI 101 [3])	3.0
	Term Credits	19.0

Summer
At Community College

CHEM 102	General Chemistry II (MCCC= CHE 152 [4])	4.5
	Term Credits	4.5

Third Year
Fall
At Drexel

CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
COOP 101	Career Management and Professional Development	0.0
ENGR 220	Fundamentals of Materials	4.0
UNIV E101	The Drexel Experience	1.0
ENGR 113	First-Year Engineering Design	3.0
ARCH 141	Architecture and Society I	3.0
	Term Credits	14.0

Winter
At Drexel

ARCH 191	Studio 1-AE	3.0
CAEE 203	System Balances and Design in CAEE	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 210	Introduction to Thermodynamics	3.0
ARCH 142	Architecture and Society II	3.0
	Term Credits	13.0

Spring
At Drexel

CO-OP		
	Term Credits	0.0

Summer
At Drexel

CO-OP		
	Term Credits	0.0

Fourth Year
Fall
At Drexel

AE 340	Architectural Illumination and Electrical Systems	3.0
ARCH 192	Studio 2-AE	3.0
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
CIVE 320	Introduction to Fluid Flow	3.0
	Term Credits	13.0

Winter
At Drexel

AE 220	Introduction to HVAC	3.5

CIVE 330	Hydraulics	4.0
CAEE 361	Statistical Analysis of Engineering Systems	3.0
CIVE 250	Construction Materials	4.0
	Term Credits	14.5

Spring

At Drexel

CO-OP

| | Term Credits | 0.0 |

Summer

At Drexel

CO-OP

| | Term Credits | 0.0 |

Fifth Year

Fall

At Drexel

AE 390	Architectural Engineering Design I	4.0
ARCH 143	Architecture and Society III	3.0
CIVE 302	Structural Analysis I	4.0
CIVE 312	Soil Mechanics I	4.0
	Term Credits	15.0

Winter

At Drexel

AE 391	Architectural Engineering Design II	4.0
CIVE 315	Soil Mechanics II	4.0
CIVE 303	Structural Design I	3.0
Professional Elective		3.0
	Term Credits	14.0

Spring

At Drexel

CO-OP

| | Term Credits | 0.0 |

Summer

At Drexel

CO-OP

| | Term Credits | 0.0 |

Sixth Year

Fall

At Drexel

AE 544	Building Envelope Systems	3.0
CAE 491 [WI]	Senior Design Project I	3.0
CIVE 400	First Principles of Structural Design	3.0
	Term Credits	9.0

Winter

At Drexel

CAE 492 [WI]	Senior Design Project II	3.0
CIVE 401	Structural Design II	3.0
	Term Credits	6.0

Spring

At Drexel

CAE 493 [WI]	Senior Design Project III	3.0
CIVE 402	Structural Design III	3.0
	Term Credits	6.0

Total Credit: 183.5-185.0

*   CS 190 sub for ENGR 131 for non EE & CE majors

**   MATH 201 sub for ENGR 231

*** MATH 210 sub for ENGR 232

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Business Administration - Major in Accounting

Drexel Degree Name: BSBA in Accounting

Community College Degree Name: A.S. in Business Administration

Sample Plan of Study - First & Second Year at Montgomery County Community College

62 Credits at MCCC Transfer as 81 Credits at Drexel

First Year

Fall		Credits
At Community College		
ACCT 115	Financial Accounting Foundations (MCCC= ACCT 115 [4])	4.0
ECON 202	Principles of Macroeconomics (MCCC= ECO 121 [3])	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
MATH 101	Introduction to Analysis I (MCCC= MAT 140 [3])	4.0
CS 161	Introduction to Computing (MCCC= CIS 110 [3])	3.0
	Term Credits	18.0

Spring

At Community College

ACCT 116	Managerial Accounting Foundations (MCCC= ACCT 116 [3])	4.0
ECON 201	Principles of Microeconomics (MCCC= ECO 122 [3])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 102 [3])	6.0
MATH 102	Introduction to Analysis II (MCCC= MAT 142 [3])	4.0
General Education Elective (MCCC= Elective [3])		3.0
	Term Credits	21.0

Second Year
Fall
  At Community College

BIO 100	Applied Cells, Genetics & Physiology (MCCC= Core Goal 8; Physical and Life Sciences [4])	3.0
STAT 201	Introduction to Business Statistics (MCCC= MAT 131 [3])	4.0
TGFE 099 (MCCC= MGT 111 [3])		3.0
General Education Electives (MCCC= Core Goal 1B; Oral Communication Skills [3])		3.0
General Education Elective (MCCC= Elective [3])		3.0
	Term Credits	16.0

Spring
  At Community College

MKTG 201	Introduction to Marketing Management (MCCC= MKT 111 [3])	4.0
STAT 202	Business Statistics II (MCCC= MAT 132 [3])	4.0
TGFE 099 (MCCC= ACC 150 [3])		3.0
TGFE 099 (MCCC= Core Goal 10: Exercise & Health Sciences [2-3])		3.0
General Education Elective (MCCC= Elective [3])		3.0
Excess Free Elective Credits		9.0
	Term Credits	26.0

Third Year
Fall
  At Drexel

ACCT 321	Financial Reporting I	4.0
BUSN 111	Foundations for Business	4.0
COOP 101	Career Management and Professional Development	0.0
MIS 200	Management Information Systems	4.0
English Literature Elective		3.0
	Term Credits	15.0

Winter
  At Drexel

ACCT 322	Financial Reporting II	4.0
FIN 301	Introduction to Finance	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
UNIV B101	The Drexel Experience	1.0
HIST Elective		4.0
	Term Credits	17.0

Spring
  At Drexel
  CO-OP

	Term Credits	0.0

Summer
  At Drexel
  CO-OP

	Term Credits	0.0

Fourth Year
Fall
  At Drexel

ACCT 323	Financial Reporting III	4.0
ACCT 331	Cost Accounting	4.0
BLAW 201	Business Law I	4.0
CHEM 151 or PHYS 151	Applied Chemistry Applied Physics	3.0
OPM 200	Operations Management	4.0
	Term Credits	19.0

Winter
  At Drexel

PSY 101	General Psychology I	3.0
ACCT 341	Principles of Auditing	4.0
TAX 341	Individual Income Taxes	4.0
CIVC 101	Introduction to Civic Engagement	1.0
BUSN Elective (MGMT 260, MGMT 451, MGMT 370, MGMT 371)		4.0
	Term Credits	16.0

Spring
  At Drexel
  CO-OP

	Term Credits	0.0

Summer
  At Drexel
  CO-OP

	Term Credits	0.0

Fifth Year
Fall
  At Drexel

ACCT 329	Advanced Accounting	4.0
COM 270 [WI]	Business Communication	3.0
INTB 200	International Business	4.0
PHIL 105	Critical Reasoning	3.0
TAX 342	Business Income Taxes	4.0
	Term Credits	18.0

Winter
  At Drexel

MGMT 450	Strategy and Competitive Advantage	4.0
UNIV B201 [WI]	Career Management	1.0
Fine Arts		3.0
Society & Culture		3.0
Social Science Elective		3.0
	Term Credits	14.0

Total Credit: 180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Business Administration - Major in Finance

Drexel Degree Name: BSBA in Finance

Community College Degree Name: A.S. Business Administration

Sample Plan of Study - First & Second Year at Montgomery County Community College

62 Credits at MCCC Transfer as 81 Credits at Drexel

Please contact the Department of Finance **(**https://www.lebow.drexel.edu/faculty-and-research/disciplines/finance/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
ACCT 115	Financial Accounting Foundations (MCCC= ACC 115 [4])	4.0
CS 161	Introduction to Computing (MCCC= CIS 110 [3])	3.0
ECON 202	Principles of Macroeconomics (MCCC= ECO 121 [3])	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
MATH 101	Introduction to Analysis I (MCCC= MAT 140 [3])	4.0
	Term Credits	18.0

Spring

At Community College		
ACCT 116	Managerial Accounting Foundations (MCCC= ACC 116 [3])	4.0
ECON 201	Principles of Microeconomics (MCCC= ECO 122 [3])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 102 [3])	6.0
MATH 102	Introduction to Analysis II (MCCC= MAT 142 [3])	4.0
General Education Elective (MCCC= Core Goal 6: Intellectural Heritage 7 Core Goal 7: Aesthetic Sensibility & the Arts [3])		3.0
	Term Credits	21.0

Second Year

Fall

At Community College		
Free Elective (MCCC= MGT 111 [3])		
STAT 201	Introduction to Business Statistics (MCCC= MAT 131 [3])	4.0
General Education Elective (MCCC= Core Goal 1B [3])		3.0
BIO 100	Applied Cells, Genetics & Physiology (MCCC= Core Goal 8; Physical and Life Sciences [4])	3.0

General Education Elective (MCCC= Elective [3])		3.0
	Term Credits	13.0

Spring

At Community College		
MKTG 201	Introduction to Marketing Management (MCCC= MKT 111 [3])	4.0
STAT 202	Business Statistics II (MCCC= MAT 132 [3])	4.0
Free Elective (MCCC= ACC 150 [3])		3.0
Free Elective (MCCC= Core Goal 10: Exercise & Health Sciences [2-3])		3.0
General Education Elective (MCCC= Elective [3])		3.0
Excess Free Elective Credits		12.0
	Term Credits	29.0

Third Year

Fall

At Drexel		
BUSN 111	Foundations for Business	4.0
COOP 101	Career Management and Professional Development	0.0
FIN 301	Introduction to Finance	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
English Literature Elective		3.0
UNIV B101	The Drexel Experience	1.0
	Term Credits	16.0

Winter

At Drexel		
FIN 302	Intermediate Corporate Finance	4.0
FIN 321	Investment Securities & Markets	4.0
MIS 200	Management Information Systems	4.0
HIST Elective		4.0
	Term Credits	16.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
BLAW 201	Business Law I	4.0
CHEM 151 or PHYS 151	Applied Chemistry Applied Physics	3.0
FIN 325	Financial Institutions and Markets	4.0
OPM 200	Operations Management	4.0
PSY 101	General Psychology I	3.0
	Term Credits	18.0

Winter

At Drexel		
CIVC 101	Introduction to Civic Engagement	1.0
Finance Elective		4.0
Finance Elective		4.0
Social Science Elective		3.0
BUSN Elective (MGMT 260, MGMT 451, MGMT 370, MGMT 371)		4.0
	Term Credits	16.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
COM 270 [WI]	Business Communication	3.0
INTB 200	International Business	4.0
PHIL 105	Critical Reasoning	3.0
Finance Elective		4.0
Finance Elective		4.0
	Term Credits	18.0
Winter		
At Drexel		
MGMT 450	Strategy and Competitive Advantage	4.0
UNIV B201 [WI]	Career Management	1.0
Society and Culture		3.0
Finance Elective		4.0
Fine Arts		3.0
	Term Credits	15.0

Total Credit: 180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Business Administration - Major in Marketing

Drexel Degree Name: BSBA in Marketing

Community College Degree Name: A.S. in Business Administration

Sample Plan of Study - First & Second Year at Montgomery County Community College

62 Credits at MCCC Transfers as 81 Credits at Drexel

Please contact the Department of Marketing **(**https://www.lebow.drexel.edu/faculty-and-research/disciplines/marketing/**) for the most current Plan of Study.**

First Year		
Fall		**Credits**
At Community College		
ACCT 115	Financial Accounting Foundations (MCCC= ACC 115 [4])	4.0
ECON 202	Principles of Macroeconomics (MCCC= ECO 121 [3])	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
MATH 101	Introduction to Analysis I (MCCC= MAT 140 [3])	4.0
CS 161	Introduction to Computing (MCCC= CIS 110 [3])	3.0
	Term Credits	18.0
Spring		
At Community College		
ACCT 116	Managerial Accounting Foundations (MCCC= ACC 116 [3])	4.0
ECON 201	Principles of Microeconomics (MCCC= ECO 122 [3])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 102 [3])	6.0
MATH 102	Introduction to Analysis II (MCCC= MAT 142[3])	4.0
General Education Elective (MCCC= Core Goal 6: Intellectual Heritage and Core Goal 7: Aesthetic Sensibility & the Arts [3])		3.0
	Term Credits	21.0
Second Year		
Fall		
At Community College		
BIO 100	Applied Cells, Genetics & Physiology (MCCC= Core Goal 8; Physical and Life Sciences [4])	3.0
STAT 201	Introduction to Business Statistics (MCCC= MAT 131 [3])	4.0
Transfer Free Elective (MCCC= MGT 111 [3])		3.0
General Education Elective (MCCC= Core Goal 1B: Oral Communication Skills [3])		3.0
General Education Elective (MCCC= Elective [3])		3.0
	Term Credits	16.0
Spring		
At Community College		
MKTG 201	Introduction to Marketing Management (MCCC= MKT 111 [3])	4.0
STAT 202	Business Statistics II (TGFE 099 (MCCC= ACC 150 [3]))	4.0
Transfer Free Elective (MCCC= Core Goal 10: Exercise & Health Sciences [2-3])		3.0
Transfer Free Elective (MCCC= ACC 150 [3])		3.0
General Education Elective (MCCC= Elective [3])		3.0
Excess Free Elective Credits		9.0
	Term Credits	26.0

Third Year

Fall

At Drexel

BUSN 111	Foundations for Business	4.0
COOP 101	Career Management and Professional Development	0.0
MIS 200	Management Information Systems	4.0
MKTG 326	Marketing Insights	4.0
English Literature Elective		3.0
UNIV B101	The Drexel Experience	1.0
	Term Credits	16.0

Winter

At Drexel

FIN 301	Introduction to Finance	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
MKTG 356	Consumer Behavior	4.0
HIST Elective		4.0
	Term Credits	16.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fourth Year

Fall

At Drexel

BLAW 201	Business Law I	4.0
CHEM 151 or PHYS 151	Applied Chemistry or Applied Physics	3.0
OPM 200	Operations Management	4.0
PSY 101	General Psychology I	3.0
MKTG Elective[*]		4.0
	Term Credits	18.0

Winter

At Drexel

CIVC 101	Introduction to Civic Engagement	1.0
MKTG Elective[*]		8.0
Social Science Elective		3.0
BUSN Elective (MCC= MGMT 260, MGMT 451, MGMT 370, MGMT 371)		4.0
	Term Credits	16.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

MKTG 380	Seminar in Marketing Strategy	4.0
COM 270 [WI]	Business Communication	3.0
PHIL 105	Critical Reasoning	3.0
INTB 200	International Business	4.0
MKTG Elective[*]		4.0
	Term Credits	18.0

Winter

At Drexel

MGMT 450	Strategy and Competitive Advantage	4.0
UNIV B201 [WI]	Career Management	1.0
Society and Culture		3.0
MKTG Elective[*]		4.0
Fine Arts		3.0
	Term Credits	15.0

Total Credit: 180.0

[*]   MKTG elective options are MKTG 321, MKTG 322, MKTG 324, MKTG 326, MKTG 344, MKTG 347, MKTG 348, MKTG 351, MKTG 355, MKTG 356, MKTG 357, MKTG 362, MKTG 364

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Chemical Engineering

Drexel Degree Name: B.S in Chemical Engineering

Community College Degree Name: A.S in Engineering Science

Sample Plan of Study - First & Second Year at Montgomery County Community College

62 Credits at MCCC transfers over as 74-79.5 Credits at Drexel

Please contact the Department of Chemical and Biological Engineering **(**https://drexel.edu/engineering/academics/departments/chemical-biological-engineering/**) for the most current Plan of Study.**

First Year

Fall

At Community College		Credits
CS 190[*]	Selected Computer Language (MCCC= EGR 111 [3])	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis (MCCC= EGR 102 [3])	3.0
MATH 121	Calculus I (MCCC= MAT 190 [4])	4.0
PHYS 101	Fundamentals of Physics I (MCCC= PHY 151 [4])	4.0
	Term Credits	17.0

Spring

At Community College		
COM 230	Techniques of Speaking (MCCC= SPC 120 [3] And DU Free Elective	4.5
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 102 [3])	6.0
MATH 122 & MATH 123	Calculus II (MCCC= MAT 201 [4])	8.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (MCCC= PHY 152 [4])	8.0
	Term Credits	26.5

Second Year

Fall

At Community College		
CHEM 101	General Chemistry I (MCCC= CHE 151 [4])	3.5
MATH 210	Differential Equations (MCCC= MAT 223 [4])	4.0
MEM 202	Statics (MCCC= EGR 203 [3])	3.0
TGFE 099 (MCCC= Core Goal 10; Exercise and Health Science [2-3])		3.0-4.5
	Term Credits	13.5-15.0

Spring

At Community College		
HIST 161	Themes in World Civilization I (MCCC= HIS 101 [3])	4.0
MATH 200	Multivariate Calculus (MCCC= MAT 202 [4])	4.0
MEM 230	Mechanics of Materials I (MCCC= EGR 213 [3])	0.0-4.0
PHIL 251	Ethics (MCCC= PHI 101 [3]) and Free Elective	4.5
	Term Credits	12.5-16.5

Summer

At Community College

CHEM 102	General Chemistry II (MCCC= CHE 152 [4])	4.5
	Term Credits	4.5

Third Year

Fall

At Drexel		
CHE 211	Material and Energy Balances I	4.0
CHE 220	Computational Methods in Chemical Engineering I	3.0
CHEM 241	Organic Chemistry I	4.0
COOP 101	Career Management and Professional Development	0.0
ENGR 113	First-Year Engineering Design	3.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	15.0

Winter

At Drexel		
CHE 212	Material and Energy Balances II	4.0
CHE 230	Chemical Engineering Thermodynamics I	4.0
CHEM 242	Organic Chemistry II	4.0
CIVC 101	Introduction to Civic Engagement	1.0
MATH 201	Linear Algebra	4.0
General Education Elective		3.0
	Term Credits	20.0

Spring

At Drexel		
CO-OP		
General Education Elective		3.0
	Term Credits	3.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
CHE 330	Chemical Engineering Thermodynamics II	4.0
CHE 341	Fluid Mechanics	4.0
CHE 350	Statistics and Design of Experiments	3.0
CHEM 356	Physical Chemistry Laboratory	2.0
ENGR 220	Fundamentals of Materials	4.0
	Term Credits	17.0

Winter

At Drexel		
CHE 320	Computational Methods in Chemical Engineering II	3.0
CHE 342	Heat Transfer	4.0
CHE 343	Mass Transfer	4.0
CHE 351	Chemical Engineering Laboratory I	2.5
	Term Credits	13.5

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel		
CHE 331	Separation Processes	3.0
CHE 362	Chemical Kinetics and Reactor Design	4.0
CHE 453	Chemical Engineering Laboratory III	2.5
CHE 464	Process Dynamics and Control	3.0

CHE 471	Process Design I	4.0
	Term Credits	16.5
Winter		
At Drexel		
CHE 352	Chemical Engineering Laboratory II	2.5
CHE 371	Engineering Economics and Professional Practice	3.0
CHE 372	Integrated Case Studies in Chemical Engineering	3.0
CHE 472	Process Design II	3.0
CHE Technical Electives		3.0
	Term Credits	14.5
Spring		
At Drexel		
CHE 466	Chemical Process Safety	3.0
CHE 473	Process Design III	3.0
CHEC 353	Physical Chemistry and Applications III	4.0
BIO Elective		3.0
Tech Elective		3.0
	Term Credits	16.0

Total Credit: 189.5-195.0

*   Replaces ENGR 131 for non ECE majors

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Civil Engineering

Drexel Degree Name: B.S in Civil Engineering

Community College Degree Name: A.S in Engineering Science

Sample Plan of Study - First & Second Year at Montgomery County Community College

66 Credits at MCCC transfers over as 73 Credits at Drexel

Please contact the Department of Civil, Architectural and Environmental Engineering **(**https://drexel.edu/engineering/academics/departments/civil-architectural-environmental-engineering/**) for the most current Plan of Study.**

First Year		
Fall		**Credits**
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis (MCCC= EGR 111[3])	3.0
MATH 121	Calculus I (MCCC= MAT 190 [4])	4.0
PHYS 101	Fundamentals of Physics I (MCCC= PHY 151 [4])	4.0
	Term Credits	14.0
Spring		
At Community College		
COM 230	Techniques of Speaking (MCCC= SPC 120 [3])	4.5
and Free Elective		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 102 [3])	6.0
MATH 122 & MATH 123	Calculus II (MCCC= MAT 201 [4])	4.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (MCCC= PHY 152 [4])	8.0
	Term Credits	22.5
Second Year		
Fall		
At Community College		
CHEM 101	General Chemistry I (MCCC= CHE 151 [4])	3.5
MATH 201	Linear Algebra (MCCC = MAT 220 [4])	4.0
MATH 262 or ENGR 232	Differential Equations (MCCC= MAT 233 [4]) Dynamic Engineering Systems	3.0
MEM 202	Statics (MCCC= EGR 203 [3])	3.0
TGFE 099 (MCCC= Core Goal 10; Exercise and Health Science [2-3])		3.0-4.5
	Term Credits	16.5-18.0
Spring		
At Community College		
MATH 200	Multivariate Calculus (MCCC= MAT 202 [4])	4.0
HIST 161	Themes in World Civilization I (MCCC= HIS 101 [3])	4.0
PHIL 251	Ethics (MCCC= PHI 101 [3])	3.0
MEM 230	Mechanics of Materials I (MCCC= EGR 214 [3])	0.0-4.0
Free Elective (MCCC= EGR 214 [4])		4.5
	Term Credits	15.5-19.5
Summer		

	At Community College	
CHEM 102	General Chemistry II (MCCC= CHE 152 [4])	4.5
	Term Credits	4.5
Third Year		
Fall		
	At Drexel	
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
ENGR 220	Fundamentals of Materials	4.0
UNIV E101	The Drexel Experience	0.0-2.0
ENGR 113	First-Year Engineering Design	3.0
CIVE 240 [WI]	Engineering Economic Analysis	3.0
	Term Credits	13.0-15.0
Winter		
	At Drexel	
CAEE 203	System Balances and Design in CAEE	3.0
CIVE 250	Construction Materials	4.0
MEM 238	Dynamics	4.0
ENGR 210	Introduction to Thermodynamics	3.0
CIVC 101	Introduction to Civic Engagement	1.0
	Term Credits	15.0
Spring		
	At Drexel	
	CO-OP	
	Term Credits	0.0
Summer		
	At Drexel	
	CO-OP	
	General Education Elective	3.0
	Term Credits	3.0
Fourth Year		
Fall		
	At Drexel	
ENVE 300	Introduction to Environmental Engineering	3.0
CAEE 361	Statistical Analysis of Engineering Systems	3.0
CIVE 320	Introduction to Fluid Flow	3.0
CIVE 302	Structural Analysis I	4.0
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
	Term Credits	17.0
Winter		
	At Drexel	
CIVE 330	Hydraulics	4.0
CIVE 303	Structural Design I	3.0
CIVE 375	Structural Material Behavior	3.0
BIO 141	Essential Biology	4.5
	Term Credits	14.5
Spring		
	At Drexel	
	CO-OP	
	Term Credits	0.0
Summer		
	At Drexel	
	CO-OP	
	General Education Elective	3.0
	Term Credits	3.0
Fifth Year		
Fall		
	At Drexel	
CAE 491 [WI]	Senior Design Project I	3.0
CIVE 312	Soil Mechanics I	4.0
CIVE 430	Hydrology	3.0
CIVE 477 [WI]	Seminar	2.0

	Professional Elective	3.0
	Professional Elective	3.0
	Term Credits	18.0
Winter		
	At Drexel	
CAE 492 [WI]	Senior Design Project II	3.0
CIVE 315	Soil Mechanics II	4.0
CIVE 478 [WI]	Seminar	1.0
	Professional Elective	3.0
	Professional Elective	3.0
	Term Credits	14.0
Spring		
	At Drexel	
CAE 493 [WI]	Senior Design Project III	3.0
	Professional Elective	3.0
	Professional Elective	3.0
	General Education Elective	3.0
	Term Credits	12.0

Total Credit: 182.5-190.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BA in Communication - Open Concentration

Drexel Degree Name: B.A. Communication, Open Concentration

Community College Degree Name: A.A. in Mass Media Concentration in Mass Media Production

Sample Plan of Study - First & Second Year at Montgomery County Community College

61 Credits at MCCC transfer over as 89-90 Credits at Drexel

Please contact the Department of Communication **(**https://drexel.edu/coas/academics/departments-centers/communication/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
COM 150	Mass Media and Society (MCCC= COM 111 [3])	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
COM 230	Techniques of Speaking (MCCC= SPC 120 [3])	3.0
PSY 101	General Psychology I (MCCC= PSY 101 [3])	3.0
Math Elective (MCCC= MAT 106 or MAT 131 [3])		3.0
	Term Credits	15.0

Spring

At Community College		
FMVD T180	Special Topics in Game Film & Video (MCCC= COM 107 [3])	3.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 102 [3])	6.0
FMVD 120	Basic Sound (MCCC= SRT 104 [3])	3.0
INFO 101	Introduction to Computing and Security Technology (MCCC= CIS 110 or OFM 101 [3])	3.0
Science Elective (MCCC= Core Goal 8: Physical and Life Science [4])		4.0
	Term Credits	19.0

Second Year

Fall

At Community College		
PHIL 305	Ethics and the Media (MCCC= COM 200 [3])	3.0
COM T280 or SCRP 270 [WI]	Special Topics in Communication Theory (MCCC= COM 125 [3]) Screenwriting I	3.0
ANTH 101, SOC 101, or PSCI 100	Introduction to Cultural Diversity (MCCC = ANT 104, SOC 101 or POL 101 [3]) Introduction to Sociology Introduction to Political Science	3.0
Humanties and Fine Arts Elective or International Studies Elective (MCCC= ENG 221 or MUS 110 [3])		3.0
Science Elective (MCCC= Core Goal 10 Exercies and Health Science [2-3])		3.0
	Term Credits	15.0

Spring

At Community College		
COM T280	Special Topics in Communication Theory (MCCC= COM 291 [3])	3.0

COM Elective (MCCC= COM 278, 225, 230, 268 or SRT 250 [3])		3.0
COM 160, ENGL 323, HIST 161, or HIST 162	Introduction to Journalism (MCCC= ENG 165, 238 or HIS 101 or 102 [3]) Literature and Other Arts Themes in World Civilization I Themes in World Civilization II	3.0-4.0
Math Elective (MCCC= MAT 106 or MAT 131 [3]		3.0
Fine Arts Elective (MCCC= ART 101, 148, 151 or 155 [3]		3.0
Excess Free Elective (Semester to quarter)		25.0
	Term Credits	40.0-41.0

Third Year

Fall

At Drexel		
COM 101	Human Communication	3.0
Foreign Language		4.0
COM 181	Public Relations Principles and Theory	3.0
COOP 101	Career Management and Professional Development	0.0
Science Elective		3.0-4.0
COM 261	Advanced Journalism	3.0
	Term Credits	16.0-17.0

Winter

At Drexel		
Science Elective		3.0
Communication Elective		3.0
Foreign Language		4.0
COM 240	New Technologies In Communication	3.0
COM 210	Theory and Models of Communication	3.0
CIVC 101	Introduction to Civic Engagement	1.0
	Term Credits	17.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
Communication Elective		3.0
Foreign Language		4.0
COM 220	Qualitative Research Methods	3.0
LING 101	Introduction to Linguistics	0.0-3.0
COM 310 [WI]	Technical Communication	3.0
	Term Credits	13.0-16.0

Winter

At Drexel		
Social Science Elective		3.0
International Studies Elective		3.0
COM 221	Quantitative Research Methods in Communication	3.0
Communication Elective		3.0
Advanced COM Elective		3.0
	Term Credits	15.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel

COM 400	Seminar in Communication	3.0
COM 491	Senior Project in Communication I	3.0
Advanced COM Elective		3.0
Studies in Diversity Elective		3.0
Humanities and Fine Arts Elective		3.0
	Term Credits	15.0

Winter

At Drexel

COM 492	Senior Project in Communication II	3.0
International Studies Elective		3.0
Interpersonal Communication		3.0
Diversity Studies Elective		3.0
Social Media in Communication		3.0
	Term Credits	15.0

Total Credit: 180.0-185.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Computer Engineering

Drexel Degree Name: B.S in Computer Engineering

Community College Degree Name: A.S in Engineering Science

Sample Plan of Study - First & Second Year at Montgomery County Community College

66 Credits at MCCC transfers over as 84-85.5 Credits at Drexel

Please contact the Department of Electrical and Computer Engineering **(**https://drexel.edu/engineering/academics/departments/electrical-computer-engineering/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
ENGR 111[*]	Introduction to Engineering Design & Data Analysis (MCCC= EGR 111 [3])	3.0
MATH 121	Calculus I (MCCC= MAT 190 [4])	4.0
PHYS 101	Fundamentals of Physics I (MCCC= PHYS 101 [4])	4.0
	Term Credits	14.0

Spring		
At Community College		
COM 230	Techniques of Speaking (MCCC= SPC 120 [3])	4.5
and Free Elective		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 102 [3])	6.0
MATH 122 & MATH 123	Calculus II (MCCC= MAT 201 [4])	8.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (MCCC= PHY 152 [4])	8.0
Free Elective (MCCC= EGR 115 [3])		4.5
	Term Credits	31.0

Second Year

Fall		
At Community College		
CHEM 101	General Chemistry I (MCCC= CHE 151 [4])	3.5
MATH 210	Differential Equations (MCCC= MAT 223 [4])	4.0
ECE 201	Foundations of Electric Circuits I (MCCC= EGR 211 [3])	4.0
Free Elective (MCCC= Core Goal 10; Exercise and Health Science [2-3])		3.0-4.5
	Term Credits	14.5-16.0

Spring		
At Community College		
MATH 200	Multivariate Calculus (MCCC= MAT 202 [4])	4.0
HIST 161	Themes in World Civilization I (MCCC= HIS 101 [3])	4.5
PHIL 251	Ethics (MCCC= PHI 101 [3])	4.5
ECE 200	Digital Logic Design (MCCC= EGR 210 [4])	4.0
Free Elective (MCCC= EGR 214 [4])		4.5
	Term Credits	21.5

Summer

CS 190	Selected Computer Language (MCCC= CIS 111B [4])	3.0
	Term Credits	3.0
Third Year		
Fall		
At Drexel		
COOP 101	Career Management and Professional Development	0.0
ECEC 201	Advanced Programming for Engineers	3.0
ECE 105	Programming for Engineers II	3.0
ENGR 113	First-Year Engineering Design	3.0
MATH 201[**]	Linear Algebra	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	14.0
Winter		
At Drexel		
MATH 221	Discrete Mathematics	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ECEC 204	Design with Microcontrollers	3.0
PHIL 315	Engineering Ethics	3.0
Free Elective		3.0
	Term Credits	13.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fourth Year		
Fall		
At Drexel		
ECEC 357	Introduction to Computer Networks	3.0
ECEC 302	Digital Systems Projects	3.0
ECE 301	Foundations of Electric Circuits II	4.0
ECE 361	Probability and Data Analytics for Engineers	4.0
CS 265	Advanced Programming Tools and Techniques	3.0
	Term Credits	17.0
Winter		
At Drexel		
ECES 301	Signals and Systems I	4.0
ECEC 355	Computer Organization & Architecture	3.0
ECE 391	Introduction to Engineering Design Methods	1.0
CS 260	Data Structures	3.0
undefined		
	Term Credits	11.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
ECE 303	ECE Laboratory	3.0
ECE Electives		9.0
ECEC 4XX Elective		3.0
ECE 491 [WI]	Senior Design Project I	2.0

Gen Ed Elec		3.0
	Term Credits	20.0
Winter		
At Drexel		
ECE Elective		6.0
ECEC 4XX Elective		3.0
General Education Elective		3.0
ECE 492 [WI]	Senior Design Project II	2.0
	Term Credits	14.0
Spring		
At Drexel		
ECE 493	Senior Design Project III	4.0
ECEC 4XX Elective		3.0
ECE Elective		3.0
	Term Credits	10.0

Total Credit: 183.0-184.5

*   along with ENGR 102 = ENGR 111

**   MATH 201 sub for ENGR 231

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Criminology and Justice Studies - Criminal Justice Concentration

Drexel Degree Name: B.S. Criminology and Justice Studies, Criminal Justice Concentration

Community College Degree Name: A.S. in Criminal Justice

Sample Plan of Study - First & Second Year at Montgomery County Community College

64 Credits at MCCC transfers over as 90 Credits at Drexel

Please contact the Department of Criminology and Justice Studies **(**https://drexel.edu/coas/academics/departments-centers/criminology-justice-studies/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
CJS 101	Introduction to Criminal Justice (MCCC= CJS 100 [3])	3.0
BLAW 342	Criminal Law (MCCC= CJS 105 [3])	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
HIST 203	United States History since 1900 (MCCC= HIS 205 [3])	4.0
COM 230	Techniques of Speaking (MCCC= CMS 110 or CMS 120 [3])	3.0
	Term Credits	17.0

Spring

At Community College		
CJS 375	Criminal Procedure (MCCC= CJS 107 [3])	3.0
PHIL 330	Criminal Justice Ethics (MCCC= CJS 205 [3])	3.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 115 or ENG 102 [3]) English Composition II	3.0
ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres (MCCC= ENG 115 or ENG 102 [3]) English Composition III	3.0
Free Elective (MCCC= ESW 245 [3])		3.0
MATH 100	Fundamentals of Mathematics (MCCC= MAT 106A [3])	3.0
SOC 101	Introduction to Sociology (MCCC= SOC 101 [3])	3.0
	Term Credits	21.0

Second Year

Fall

At Community College		
Fine Arts (MCCC= Aesthetic Sensibility Elective [3])		3.0
CJS 200	Criminology (MCCC= CJS 220 [3])	3.0
Science (MCCC= CORE-SCI [4])		4.0
HIST 201	United States History to 1815 (MCCC= HIS 203 [3])	4.0
Free Elective (MCCC= Open Elective [3])		3.0
	Term Credits	17.0

Spring

At Community College

CJS 360	Juvenile Justice (MCCC= CJS 235 [3])	3.0
CJS 277	Introduction to Correctional Practices (MCCC= CJS 240 [3])	3.0
PSCI 110	American Government (MCCC= POL 124 [3])	4.0
CJS Elective (MCCC= CJS Elective [3])		3.0
Excess Free Elective Credit from Semester to Drexel Credits		22.0
	Term Credits	35.0

Third Year

Fall

At Drexel		
CJS 100	Freshman Seminar in Crime and Justice	3.0
CJS 250	Research Methods & Analytics I	3.0
CJS 210	Race, Crime, and Justice	3.0
ANTH 101	Introduction to Cultural Diversity	3.0
PHIL 101	Introduction to Western Philosophy	3.0
	Term Credits	15.0

Winter

At Drexel		
CJS 300	Research Methods and Analytics II	3.0
CJS 260	Justice in Our Community	4.0
MATH		4.0
CJS Elective		3.0
	Term Credits	14.0

Spring

At Drexel		
CJS 261	Prison, Society and You	3.0
CJS 220	Crime and the City	3.0
Science		4.0
CJS Elective		3.0
	Term Credits	13.0

Summer

At Drexel		
CJS Elective		3.0
CJS Elective		3.0
PSY 101	General Psychology I	3.0
ENGL at 200 level or higher		3.0
	Term Credits	12.0

Fourth Year

Fall

At Drexel		
CJS 290	Crime and Public Policy	3.0
CJS 276	Introduction to Computer Crime	3.0
CIVC 101	Introduction to Civic Engagement	1.0
CJS Elective		3.0
Free Elective		3.0
	Term Credits	13.0

Winter

At Drexel		
CJS 376	Sentencing	3.0
CJS 266	Crime Prevention Planning	3.0
CJS 278	Introduction to Law Enforcement	3.0
CJS 280	Communities and Crime	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
	Term Credits	13.0

Spring

At Drexel		
CJS Elective		3.0
CJS Elective		3.0
CJS Elective		3.0

Free Elective		3.0
	Term Credits	12.0

Total Credit: 182.0

Transfer Credits

Transfer Credits

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BS in Culinary Arts and Science

Drexel Degree Name: B.S. in Culinary Arts and Science

Community College Degree Name: A.A.S in Culinary Arts

Sample Plan of Study - First & Second Year at Montgomery County Community College

68 Credits at MCCC transfers over as 76 Credits at Drexel

Please contact the Department of Food and Hospitality Management (https://drexel.edu/cnhp/academics/departments/food-hospitality-management/) for the most current Plan of Study.

First Year

Fall

Credits

At Community College

CULA 115	Culinary Fundamentals (MCCC= CUL 101 [3])	3.0
HRM 110	Introduction to the Hospitality Industry (MCCC= CUL 102 [3])	3.0
CULA 120 & CULA 121	Techniques and Traditions I (MCCC= CUL 120 [3])	6.0
CULA 125	Foundations of Professional Baking (MCCC= BPA 120 [3])	3.0
MATH 100	Fundamentals of Mathematics (MCCC= ACC 110 [3])	3.0
INFO 101	Introduction to Computing and Security Technology (MCCC= OFM 101 [3])	3.0
	Term Credits	21.0

Spring

At Community College

HRM 150	Food & Beverage Customer Service (MCCC= CUL 114 [3])	3.0
CULA 303	Global Cuisine Studio (MCCC= CUL 125 [3])	3.0
HRM 220	Purchasing for the Hospitality Industry (MCCC= CUL 151 [3])	3.0
HRM 455	Hospitality Human Resources Management (MCCC= CUL 170 [3])	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
COM 230	Techniques of Speaking (MCCC= SPC 120 [3])	3.0
	Term Credits	18.0

Second Year

Fall

At Community College

HRM 120	Principles of Food-Service Management (MCCC= CUL 220 [3])	3.0
CULA 303	Global Cuisine Studio (MCCC= CUL 250 [3])	3.0
HRM 125	Hotel Operations Management (MCCC= CUL 221 [3])	3.0
HRM 215	Commercial Food Production (MCCC= CUL 282 [4])	4.0
NFS 100 & NFS 101	Nutrition, Foods, and Health (ESW 206 [3])	3.0
	Term Credits	16.0

Spring

At Community College

CULA 303	Global Cuisine Studio (MCCC= CUL 260 [3])	3.0
CULA 303	Global Cuisine Studio (MCCC= CUL 261 [3])	3.0
Free Elective (MCCC= CUL 270 [3])		4.5
Free Elective (MCCC= Core Goal 8: Physical and Life Sciences [4])		6.0
Free Elective (MCCC= Core Goal 6; Intellectual Heritage; Core Goal 9: Behavioral and Social Sciences, Core Goal 12: Global Perspectives and Diversity and Core Goal 13: Ethical Reasoning and Behavior [3])		4.5
	Term Credits	21.0

Third Year

Fall

At Drexel

FDSC 100	ServSafe	1.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing English Composition II	3.0
FDSC 154	Science of Food and Cooking	4.0
CHEM 201	Why Things Work: Everyday Chemistry	3.0
MATH 101	Introduction to Analysis I	4.0
	Term Credits	15.0

Winter

At Drexel

ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres English Composition III	3.0
Minor Class		4.0
FDSC 120	Food and the Senses	3.0
CULA 235	Professional Dining Room Management	3.0
Minor Class		4.0
	Term Credits	17.0

Spring

At Drexel

CULA 216	A la Carte	3.0
Arts and Humanities		3.0
Minor Class		4.0
HRM 160	Laws of the Hospitality Industry	3.0
	Term Credits	13.0

Summer

At Drexel

Minor Class		4.0
CULA 291	Culinary Arts Practicum II	6.0
CULA 400	Directed Studies with a Master Chef	3.0
FDSC 350	Experimental Foods: Product Development	3.0
	Term Credits	16.0

Fourth Year

Fall

At Drexel

CULA 440	Food in the Arts	3.0
CULA 405 [WI]	Culture and Gastronomy I	3.0
FDSC 270	Microbial Food Safety and Sanitation	4.0
FDSC 401	Modernist Cuisine	3.0

CULA 421	Senior Design Project I	2.0
	Term Credits	15.0
Winter		
At Drexel		
HRM 335	Beverage Management	3.0
Arts and Humanities		3.0
HRM 350	Cost Controls in Hospitality	3.0
HRM 330	Hospitality Marketing and Branding	3.0
CULA 422	Senior Design Project II	2.0
CULA 316	Butchery Laboratory	2.0
	Term Credits	16.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
HRM 435	Wine Regions of the World	3.0
Minor Class		4.0
CULA 423	Senior Design Project III	2.0
HRM 320	Hospitality Management Information Systems	3.0
Minor Class		4.0
	Term Credits	16.0

Total Credit: 184.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not

be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Electrical Engineering

Drexel Degree Name: B.S in Electrical Engineering

Community College Degree Name: A.S in Engineering Science

Sample Plan of Study - First & Second Year at Montgomery County Community College

63 Credits at MCCC transfers over as 81-82.5 Credits at Drexel

Please contact the Department of Electrical and Computer Engineering **(**https://drexel.edu/engineering/academics/departments/electrical-computer-engineering/**) for the most current Plan of Study.**

First Year		
Fall		**Credits**
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
MATH 121	Calculus I (MCCC= MAT 190 [4])	4.0
ENGR 111[along with EGR 102 = ENGR 111]	Introduction to Engineering Design & Data Analysis (MCCC= EGR 111 [3])	3.0
PHYS 101	Fundamentals of Physics I (MCCC= PHY 151 [4])	4.0
	Term Credits	14.0
Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 102 [3])	6.0
MATH 122 & MATH 123	Calculus II (MCCC= MAT 201 [4])	8.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (MCCC= PHY 152 [4])	8.0
COM 230 & Free Elective	Techniques of Speaking (MCCC= SPC 120 [3])	4.5
Free Elec (MCCC= EGR 115 [3])		4.5
	Term Credits	31.0
Second Year		
Fall		
At Community College		
CHEM 101	General Chemistry I (MCCC= CHE 151 [4])	3.5
MATH 210 or ENGR 232	Differential Equations (MCCC= MAT 223 [4]) Dynamic Engineering Systems	4.0
ECE 201	Foundations of Electric Circuits I (MCCC= EGR 211 [4])	4.0
TGFE 099 (MCCC= Core Goal 10; Exercise and Health Science [2-3])		4.5
	Term Credits	16.0
Spring		
At Community College		

MATH 200	Multivariate Calculus (MCCC= MAT 202 [4])	4.0
HIST 161 & TGFE 099	Themes in World Civilization I (MCCC= HIS 101 [3])	4.5
PHIL 251 & TGFE 099	Ethics (MCCC= PHI 101 [3])	4.5
ECE 200	Digital Logic Design (MCCC= EGR 210 [4])	4.0
TGFE 099 (MCCC= EGR 214 [4])		4.5
	Term Credits	21.5

Third Year
Fall
   At Drexel

UNIV E101	The Drexel Experience	1.0
COOP 101	Career Management and Professional Development	0.0
ENGR 113	First-Year Engineering Design	3.0
ENGR 220	Fundamentals of Materials	4.0
MATH 201 or ENGR 231	Linear Algebra Linear Engineering Systems	4.0
	Term Credits	12.0

Winter
   At Drexel

CIVC 101	Introduction to Civic Engagement	1.0
ENGR 131	Introductory Programming for Engineers	3.0
MATH Elective		3.0
Free Elective		3.0
General Education Elective		3.0
Sophomore Engr Elective		3.0
	Term Credits	16.0

Spring
   At Drexel
CO-OP

	Term Credits	0.0

Summer
   At Drexel
CO-OP

	Term Credits	0.0

Fourth Year
Fall
   At Drexel

ECE 105	Programming for Engineers II	3.0
ECE 301	Foundations of Electric Circuits II	4.0
ECE 361	Probability and Data Analytics for Engineers	4.0
ECE Electives		6.0
	Term Credits	17.0

Winter
   At Drexel

ECES 301	Signals and Systems I	4.0
ECE Electives		6.0
PHIL 315	Engineering Ethics	3.0
ECE 391	Introduction to Engineering Design Methods	1.0
Science Elective		4.5
	Term Credits	18.5

Spring
   At Drexel
CO-OP

	Term Credits	0.0

Summer
   At Drexel
CO-OP

	Term Credits	0.0

Fifth Year
Fall

   At Drexel

ECE 491 [WI]	Senior Design Project I	2.0
ECE Elective		9.0
ECEP/S/E 4XX Elective		4.0
	Term Credits	15.0

Winter
   At Drexel

ECE 492 [WI]	Senior Design Project II	2.0
ECE Elective		3.0
ECEP/S/E 4XX Elective		4.0
ECES 303	Signals and Systems II	3.0
	Term Credits	12.0

Spring
   At Drexel

ECE 493	Senior Design Project III	4.0
ECE Elective		3.0
ECEP/S/E 4XX Elective		4.0
	Term Credits	11.0

Total Credit: 184.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Elementary Education/PK-4 Certification

Drexel Degree Name: B.S in Elementary Education/PK-4 Certification

Community College Degree Name: A.A in Education in the Early Years

Sample Plan of Study - First & Second Year at Montgomery County Community College

62 Credits at MCCC transfer as 82 Credits at Drexel

Please contact the School of Education **(**https://drexel.edu/soe/academics/undergraduate/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
EDEX 142	Special Education Foundations: Referral and Assessment (MCCC= EDU 213 [3])	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3])	3.0
EDUC 101	Foundations in Education I: A Historical and Philosophical Perspective (MCCC= EDU 100 [3])	3.0
Free Elective (MCCC= HIS 203 or 205 [3])		4.5
Free Elective (MCCC= MAT 103 [3])		4.5
Excess Free Elective Credit		1.5
	Term Credits	19.5

Spring		
At Community College		
COM 111	Principles of Communication (MCCC= SPC 120 [3])	3.0
EDUC 335	Engaging the Learner (MCCC= EDU 210 [3])	3.0
EDUC 411	Family and Community Partnerships (MCCC= EDU 245 [3])	3.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 221 or 222 [3])	6.0
MATH 107 or 173	Probability and Statistics for Liberal Arts (MCCC= MAT 104 [3]) Introduction to Analysis C	3.0
Excess Free Elective Credit		3.0
	Term Credits	21.0

Second Year

Fall		
At Community College		
BIO 161 & BIO 162	General Biology I (See Note (MCCC= Core Goal 8: Physical and Life Sciences [4]))	6.0
EDUC 236	Early Literacy I (MCCC= EDU 225 [3])	3.0
EDUC 365	Foundations in Instructing English Language Learners (MCCC= EDU 240 [3])	3.0
MUSC 130	Introduction to Music (See Note (MCCC= ART 101, 102, 103, 111, 121 or MUS 110 [3]))	3.0
Free Elective (MCCC= PSY 200 [4])		6.0
	Term Credits	21.0

Spring		
At Community College		
EDUC 105 & EDUC 205	Freshman Pedagogy Seminar (MCCC= EDU 233 [3])	4.0
EDUC 338	Expressive Arts for PK-4 (MCCC= EDU 226 Elective [3])	3.0
EDUC 409	Student Teaching Seminar I (MCCC= EDU 250 [6])	9.0

Free Elective (MCCC= EDU 233 [3])		4.5
	Term Credits	20.5

Third Year

Fall		
At Drexel		
EDUC 120	Child Development I: Typical Development	3.0
EDUC 210	Early Language Development	3.0
EDUC 305 [WI]	Junior Pedagogy Seminar	1.0
EDUC 306	Assessment of Young Children I	3.0
PSY 101	General Psychology I	3.0
MATH 171	Introduction to Analysis A	3.0
	Term Credits	16.0

Winter		
At Drexel		
EDEX 344	Inclusionary Practices for Exceptional Students	3.0
EDLT 325	Design for Learning with Digital Media	3.0
EDUC 121	Child Development II: Atypical Development	3.0
EDUC 314	Science Teaching Methods	3.0
EDUC 324	Current Research in Curriculum & Instruction	3.0
	Term Credits	15.0

Spring		
At Drexel		
EDEX 346	Literacy and Content Skill Development PreK-8	3.0
EDUC 308	Creating a Positive Classroom Climate	3.0
EDUC 336	Early Literacy II	3.0
MTED 417	Mathematics Methods and Content: Early Childhood	3.0
Literature Elective (ENGL 200-320)		3.0
	Term Credits	15.0

Summer		
At Drexel		
ECON 201	Principles of Microeconomics	4.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 355	Social Studies Teaching Methods	3.0
HIST 275	History of Pennsylvania	3.0
NFS 100 & NFS 101	Nutrition, Foods, and Health	3.0
PSY 320 [WI]	Educational Psychology	3.0
	Term Credits	19.0

Fourth Year

Fall		
At Drexel		
EDUC 316	Teaching in Urban Contexts	3.0
EDUC 405	Senior Pedagogy Seminar	1.0
CHEM 111	General Chemistry I	4.0
PHYS 151	Applied Physics	3.0
	Term Credits	11.0

Winter		
At Drexel		
EDUC 312	Educational Policy, Law & Advocacy	3.0
EDUC 410 [WI]	Student Teaching	9.0
	Term Credits	12.0

Spring		
At Drexel		
EDUC 326 [WI]	Language Arts Processes	3.0
ENVS 260	Environmental Science and Society	3.0
MTED 418	Mathematics Methods and Content	3.0
SOC 335	Sociology of Education	3.0
	Term Credits	12.0

Total Credit: 182.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Engineering Technology - Electrical Engineering Technology Concentration

Drexel Degree Name: B.S in Engineering Technology, Concentration in Electrical Engineering Technology (EET)

Community College Degree Name: A.A.S in Engineering Technology - Electrical Concentration

Sample Plan of Study - First & Second Year at Montgomery County Community College

74 Credits at MCCC transfer as 68-76 Credits at Drexel

Please contact the Department of Engineering Technology **(**https://drexel.edu/engineering/academics/departments/engineering-technology/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
MATH 110	Precalculus (MCCC= MAT 161 [4])	3.0
MET 100	Graphical Communication (MCCC= EGR 115 [3])	3.0
PHYS 103	General Physics I (MCCC= PHYS 121 [4])	0.0-4.0
TGFE 099 (MCCC= EGT 190 [3])		3.0
	Term Credits	12.0-16.0

Spring

At Community College		
PHYS 104	General Physics II (MCCC= PHYS 122 [4])	0.0-4.0
Transfer Free Elective (MCCC= ENG 115 or 117 [3])		3.0
Transfer Free Elective (MCCC= MAT 162 [4])		3.0
Transfer Free Elective (MCCC= EGR 111 [3])		3.0
Transfer Free Elective (MCCC= ESW 245 [3])		3.0
	Term Credits	12.0-16.0

Summer

At Community College		
MATH 121	Calculus I (MCCC= MATH 190 [4])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 102 [3])	6.0
	Term Credits	10.0

Second Year

Fall

At Community College		
COM 230	Techniques of Speaking (MCCC= SPC 120[3])	3.0
EET 201	Circuit Analysis I (MCCC= EGT 211 [4])	4.0
EET 205	Digital Electronics (MCCC= EGT 210 [4])	4.0
EET 206	Analog Electronics I (MCCC= EGT 230 [4])	4.0
	Term Credits	15.0

Spring

At Community College		
Transfer Free Elective (MCCC= PHI 101 [3])		4.5
Transfer Free Elective (MCCC= EGT 235 [4])		3.0
Transfer Free Elective (MCCC= HIST 101 [3])		4.5
Transfer Free Elective (MCCC= EGT 240 [4])		3.0
	Term Credits	15.0

Summer

At Community College		
MATH 122	Calculus II (MCCC= MAT 201 [4])	4.0
	Term Credits	4.0

Third Year

Fall

At Drexel		
CHEM 111	General Chemistry I	4.0
CHEM 113	General Chemistry I Laboratory	1.5
COOP 101	Career Management and Professional Development	0.0
EET 202	Circuit Analysis II	4.0
EET 311	Modeling of Engineering Systems	4.0
MET 209	Fluid Power	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	18.5

Winter

At Drexel		
CIVC 101	Introduction to Civic Engagement	1.0
EET 204	Introduction to Nanotechnology	3.0
EET 208	Introduction to Programming for Embedded Systems	3.0
EET 333 [WI]	Non-Destructive Evaluation of Materials	4.0
MET 205	Robotics and Mechatronics	3.0
MHT 205	Thermodynamics I	3.0
	Term Credits	17.0

Spring

At Drexel		
MET 101	Engineering Materials	3.0
CO-OP		
	Term Credits	3.0

Summer

At Drexel		
CO-OP		
STAT 201	Introduction to Business Statistics	4.0
	Term Credits	4.0

Fourth Year

Fall

At Drexel		
EET 209	Fundamentals of Virtual Instrumentation	3.0
EET 317	Analog Electronics II	4.0
EET 319	PLC Fundamentals	4.0
EET 322	Energy Conversion	4.0
EET 325	Microprocessors	3.0
	Term Credits	18.0

Winter

At Drexel		
EET 401	Applied Microcontrollers	4.0
INDE 240	Technology Economics	3.0
MET 204	Applied Quality Control	3.0
MHT 226	Measurement Techniques and Instrumentation	3.0
	Term Credits	13.0

Spring

At Drexel		
PHIL 315	Engineering Ethics	3.0
CO-OP		
	Term Credits	3.0

Summer

At Drexel	

CO-OP

	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
MET 421 [WI]	Senior Design Project I	3.0
EET 324	Power Electronics	4.0
HIST 285	Technology in Historical Perspective	4.0
Technical Elective		3.0
	Term Credits	14.0
Winter		
At Drexel		
MET 422	Senior Design Project II	3.0
EET 313	Signals and Systems I	4.0
EET 323	Electrical Systems Design	3.0
INDE 370	Industrial Project Management	3.0
	Term Credits	13.0
Spring		
At Drexel		
COM 111	Principles of Communication	3.0
MET 423 [WI]	Senior Design Project III	3.0
Technical Elective		3.0
Free Elective		3.0
	Term Credits	12.0

Total Credit: 183.5-191.5

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Engineering Technology - Mechanical Engineering Technology Concentration

Drexel Degree Name: B.S in Engineering Technology, Concentration in Mechanical Engineering Technology

Community College Degree Name: A.A.S in Engineering Technology - Mechanical Concentration

Sample Plan of Study - First & Second Year at Montgomery County Community College

79 Credits at MCCC transfer over as 72-80 Credits at Drexel

Please contact the Department of Engineering Technology **(**https://drexel.edu/engineering/academics/departments/engineering-technology/**) for the most current Plan of Study.**

First Year		
Fall		**Credits**
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
MATH 110	Precalculus (MCCC= MAT 161 [4])	3.0
MET 100	Graphical Communication (MCCC= EGR 115 [3])	3.0
PHYS 103	General Physics I (MCCC= PHY 121 [4])	0.0-4.0
Transfer Free Elective (MCCC= EGT 190 [3])		3.0
	Term Credits	12.0-16.0
Spring		
At Community College		
PHYS 104	General Physics II (MCCC= PHY 122 [4])	0.0-4.0
Transfer Free Elective (MCCC= ENG 115 or 117 [3])		3.0
Transfer Free Elective (MCCC= MAT 162 [4])		3.0
Transfer Free Elective (MCCC= EGR 111 [3])		3.0
Transfer Free Elective (MCCC= ESW 245 [3])		3.0
	Term Credits	12.0-16.0
Summer		
At Community College		
MATH 121	Calculus I (MCCC= MAT 190 [4])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 102 [4])	6.0
	Term Credits	10.0
Second Year		
Fall		
At Community College		
COM 230	Techniques of Speaking (MCCC= SPC 120 [3])	3.0
EET 201	Circuit Analysis I (MCCC= EGT 211 [4])	4.0
MET 209	Fluid Power (MCCC+ EGT 212 [4])	4.0
MET 213	Applied Mechanics (MCCC_ EGT 203 [4])	4.0
MHT 222	Applied Dynamics I (MCCC+ EGT 204 [4])	4.0
	Term Credits	19.0

Spring

At Community College

MHT 205	Thermodynamics I (MCCC= EGT 215 [4])	3.0
Transfer Free Elective (MCCC= PHI 101 [3])		4.5
Transfer Free Elective (MCCC= EGT 213 [4])		3.0
Transfer Free Elective (MCC= HIST 101 [3])		4.5
	Term Credits	15.0

Summer

At Community College

MATH 122	Calculus II (MCCC= MTH 201 [4])	4.0
	Term Credits	4.0

Third Year

Fall

At Drexel

CHEM 111	General Chemistry I	4.0
CHEM 113	General Chemistry I Laboratory	1.5
COOP 101	Career Management and Professional Development	0.0
EET 102	Introduction to Engineering Technology	3.0
EET 202	Circuit Analysis II	4.0
EET 205	Digital Electronics	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	17.5

Winter

At Drexel

CIVC 101	Introduction to Civic Engagement	1.0
EET 204	Introduction to Nanotechnology	3.0
EET 208	Introduction to Programming for Embedded Systems	3.0
EET 209	Fundamentals of Virtual Instrumentation	3.0
EET 333 [WI]	Non-Destructive Evaluation of Materials	4.0
MET 205	Robotics and Mechatronics	3.0
	Term Credits	17.0

Spring

At Drexel

MET 101	Engineering Materials	3.0
CO-OP		
	Term Credits	3.0

Summer

At Drexel

CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel

MET 316	Computer Numerical Control	3.0
MET 408	MFG Information Management	3.0
MHT 206	Thermodynamics II	3.0
MHT 301	Fluid Mechanics I	3.0
STAT 201	Introduction to Business Statistics	4.0
	Term Credits	16.0

Winter

At Drexel

EET 311	Modeling of Engineering Systems	4.0
EET 401	Applied Microcontrollers	4.0
INDE 240	Technology Economics	3.0
MET 204	Applied Quality Control	3.0
MHT 206	Thermodynamics II	3.0
	Term Credits	17.0

Spring

At Drexel

PHIL 315	Engineering Ethics	3.0

CO-OP		
	Term Credits	3.0

Summer

At Drexel

CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel

MET 421 [WI]	Senior Design Project I	3.0
EET 319	PLC Fundamentals	4.0
INDE 370	Industrial Project Management	3.0
Technical Elective		3.0
HIST 285	Technology in Historical Perspective	4.0
	Term Credits	17.0

Winter

At Drexel

MET 422	Senior Design Project II	3.0
MHT 401	Mechanical Design I	4.0
MET 407	Manufacturing Processes	3.0
MHT 314	Thermo and Heat Transfer Analysis	3.0
	Term Credits	13.0

Spring

At Drexel

COM 111	Principles of Communication	3.0
MET 423 [WI]	Senior Design Project III	3.0
Technical Elective		3.0
Free Elective		3.0
	Term Credits	12.0

Total Credit: 187.5-195.5

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not

be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BA in Entrepreneurship and Innovation

Drexel Degree Name: B.A. in Entrepreneurship and Innovation

Community College Degree Name: A.A. in Liberal Studies

Sample Plan of Study - First & Second Year at Montgomery County Community College

60 Credits at MCCC transfer over as 75 Credits at Drexel

Please contact the Close School of Entrepreneurship **(**https://drexel.edu/close/academics/undergraduate/BA-entrepreneurship-innovation/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
COM 230	Techniques of Speaking (MCCC= Oral Communication elective, recommend SPC 230 [3])	3.0
CS 161	Introduction to Computing (MCCC= Core Goal 4, recommend CIS 110 or CIS 111 [3])	3.0
MATH 100	Fundamentals of Mathematics (MCCC= Quantitative Reasoning Elective, recommend MATH 106 [3])	3.0
Social/behavioral (MCCC= social science elective [3])		3.0
	Term Credits	15.0

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENGL 102 [3]	6.0
Social/Behavioral (MCCC= HIS 101 or HIS 102 [3])		3.0
Science (MCCC= Physical/ Life Sciences elective [3])		4.0
Any 101-level foreign language (MCCC= Any foreign language [3])		4.0
MATH 101 (MCCC= open elective, recommend MAT 125, 131, 140, or 161)		4.0
	Term Credits	21.0

Second Year

Fall		
At Community College		
Ethics (MCCC= Core Goal 13: Ethical Reasoning & Behavior, recommend COM 200, HCP 114, HCP 120, HSW 105, MGT 210, PHI 100, PHI 101, PHI 115, PHI 120, SOC 103, SOC 105 [3])		3.0
Humanities/Fine Arts (MCCC= Cultural awareness/Diversity, recommend ART 101-171, ENG 212, ENG 222, ENG 246, ENG 255, PHI 101, PHIL 115, PHI 120, SPC 111, THA 114 [3])		3.0
Science course (MCCC= any physical/life sciences course [3])		4.0
Humanities/Fine Arts (MCCC= Elective, recommend any ART courses or ENG 115-ENG 285 [3])		3.0

Any 102-level foreign language in sequence with prior language (MCCC= Any 102-level foreign language [3])		8.0
	Term Credits	21.0

Spring		
At Community College		
ACCT 120	Accounting Essentials for New Ventures (MCCC= Open elective; ACC 115 [3])	4.0
BLAW 346	Entrepreneurial Law (MCCC= Open elective; ACC 151 [3])	4.0
MKTG 201	Introduction to Marketing Management (MCCC= Open elective; ETP 211 [3])	4.0
PHIL 105	Critical Reasoning (MCCC= Open elective; PHI 115 [3])	3.0
Free elective (MCCC= Open elective [3])		3.0
	Term Credits	18.0

Third Year

Fall		
At Drexel		
ENTP 100	Innovation Ecosystem	1.0
ECON 201	Principles of Microeconomics	4.0
ENTP 105	Entrepreneurship Practice & Mindset	3.0
ENTP 250	Ideation	3.0
ENTP 225 [WI]	Mindfulness & Wellbeing	3.0
Free elective		3.0
	Term Credits	17.0

Winter		
At Drexel		
ENTP 101	Life Strategies I	3.0
ENTP 205	Ready, Set, Fail	3.0
CIVC 101	Introduction to Civic Engagement	1.0
Entrepreneurship elective		3.0
Free elective		3.0
Required minor course		3.0
	Term Credits	16.0

Spring		
At Drexel		
CO-OP		
	Term Credits	0.0

Summer		
At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall		
At Drexel		
Required minor courses		6.0
Concentration requirement		3.0
Entrepreneurship elective		3.0
Free elective		3.0
	Term Credits	15.0

Winter		
At Drexel		
Ethics Course		3.0
Concentration Requirement		3.0
Entrepreneurship elective		3.0
Required minor course		3.0
Fine Arts/Humanities elective		3.0
	Term Credits	15.0

Spring		
At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
ENTP 410 [WI]	Thought Leadership	3.0
ENTP Elective		3.0
Concentration Requirement		3.0
Required minor course		3.0
Technology course		3.0
	Term Credits	15.0
Winter		
At Drexel		
Concentration requirement		3.0
Free Elective		3.0
Required minor courses		6.0
Non-major writing-intensive course		3.0
	Term Credits	15.0
Spring		
At Drexel		
ENTP 215	Building Entrepreneurial Teams	3.0
Required minor course		3.0
Entrepreneurship elective		3.0
Free Elective		6.0
	Term Credits	15.0

Total Credit: 183.0

Writing-Intensive Course Requirements

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Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Environmental Engineering

Drexel Degree Name: B.S in Environmental Engineering

Community College Degree Name: A.S in Engineering Science

Sample Plan of Study - First & Second Year at Montgomery County Community College

70 Credits at MCCC transfer over as 83.5-85 Credits at Drexel

Please contact the Department of Civil, Architectural and Environmental Engineering **(**https://drexel.edu/engineering/academics/departments/civil-architectural-environmental-engineering/**) for the most current Plan of Study.**

First Year		
Fall		**Credits**
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis (MCCC = EGR 111 & 102[6])	3.0
MATH 121	Calculus I (MCCC= MAT 190 [4])	4.0
PHYS 101	Fundamentals of Physics I (MCCC= PHY 151 [4])	4.0
	Term Credits	14.0
Spring		
At Community College		
COM 230 and Transfer Free Elective	Techniques of Speaking (MCCC= SPC 120 [3])	4.5
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC+ ENG 102 [3])	6.0
MATH 122 & MATH 123	Calculus II (MCCC= MAT 201 [4])	8.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (MCCC= PHY 152 [4])	8.0
	Term Credits	26.5
Summer		
At Community College		
BIO 141	Essential Biology (MCCC= BIO 121 or 151 [4])	4.5
	Term Credits	4.5
Second Year		
Fall		
At Community College		
CHEM 101	General Chemistry I (MCCC= CHE 151 [4])	3.5
MATH 200	Multivariate Calculus (MCCC= MAT 202 [4])	4.0
MATH 201 sub for ENGR 231	Linear Algebra (MCCC = MAT 220[4])	4.0
MEM 202	Statics (MCCC= EGR 203 [3])	3.0
TGFE 099 (MCCC= Core Goal 10; Exercise and Health Science [2-3])		3.0-4.5
	Term Credits	17.5-19.0
Spring		

At Community College		
BIO 141	Essential Biology (MC3 = BIO 100 or 110[3])	4.5
HIST 161	Themes in World Civilization I (MCCC= HIS 101 [4])	4.5
and Transfer Free Elective		
MATH 262	Differential Equations (MCCC= MAT 223 [4])	3.0
or ENGR 232	Dynamic Engineering Systems	
PHIL 251	Ethics (MCCC= PHI 101 [3])	4.5
and Transfer Free Elective		
	Term Credits	16.5
Summer		
At Community College		
CHEM 102	General Chemistry II (MCCC= CHE 152 [4])	4.5
	Term Credits	4.5
Third Year		
Fall		
At Drexel		
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
CHEM 241	Organic Chemistry I	4.0
COOP 101	Career Management and Professional Development	0.0
ENGR 113	First-Year Engineering Design	3.0
ENGR 220	Fundamentals of Materials	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	15.0
Winter		
At Drexel		
CAEE 203	System Balances and Design in CAEE	3.0
CHEM 242	Organic Chemistry II	4.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 210	Introduction to Thermodynamics	3.0
ENVS 230	General Ecology	3.0
	Term Credits	14.0
Spring		
At Drexel		
CO-OP		
PHIL 315	Engineering Ethics	3.0
	Term Credits	3.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fourth Year		
Fall		
At Drexel		
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
CHE 211	Material and Energy Balances I	4.0
CIVE 320	Introduction to Fluid Flow	3.0
ENVE 300	Introduction to Environmental Engineering	3.0
ENVS 401	Chemistry of the Environment	3.0
	Term Credits	17.0
Winter		
At Drexel		
BIO 220	Essential Microbiology	3.0
CIVE 330	Hydraulics	4.0
ENVE 302	Environmental Transport and Kinetics	3.0
Technical Elective		3.0
General Education Elective		3.0
	Term Credits	16.0
Spring		
At Drexel		
CO-OP		

CIVE 240 [WI]	Engineering Economic Analysis	3.0
	Term Credits	3.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
CIVE 430	Hydrology	3.0
CHEM 230	Quantitative Analysis	4.0
CHEM 231 [WI]	Quantitative Analysis Laboratory	2.0
ENVE 465	Indoor Air Quality	3.0
or 460	Fundamentals of Air Pollution Control	
ENVE 485	Professional Environmental Engineering Practice	1.0
ENVE 491 [WI]	Senior Project Design I	3.0
Technical Elective		
	Term Credits	16.0
Winter		
At Drexel		
CIVE 431	Hydrology-Ground Water	3.0
ENVE 410	Solid and Hazardous Waste	3.0
ENVE 421	Water and Waste Treatment II	3.0
ENVE 486	Environmental Engineering Processes Laboratory I	2.0
ENVE 492 [WI]	Senior Design Project II	3.0
Technical Elective		3.0
	Term Credits	17.0
Spring		
At Drexel		
CAEE 361	Statistical Analysis of Engineering Systems	3.0
ENVE 422	Water and Waste Treatment Design	3.0
ENVE 435	Groundwater Remediation	3.0
ENVE 487	Environmental Engineering Processes Laboratory II	2.0
ENVE 493 [WI]	Senior Design Project III	3.0
	Term Credits	14.0

Total Credit: 198.5-200.0

Writing-Intensive Course Requirements

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Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BA in Environmental Studies and Sustainability

Drexel Degree Name: B.A. Environmental Studies and Sustainability

Community College Degree Name: A.S in Environmental Studies

Sample Plan of Study - First & Second Year at Montgomery County Community College

70 Credits at MCCC transfer over as 90 Credits at Drexel

First Year

Fall

At Community College		Credits
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
BIO 107 & BIO 108	Cells, Genetics & Physiology (MCCC= *take BIO 121 [4])	4.0
ENVS 260	Environmental Science and Society (MCCC= BIO 115 [3])	3.0
MATH 101	Introduction to Analysis I (MCCC = MAT 161 [4])	4.0
CHEM 111 & CHEM 113	General Chemistry I (MCCC = * take CHE 121 [4])	5.5
	Term Credits	19.5

Spring

At Community College		
BIO 109 & BIO 110	Biological Diversity, Ecology & Evolution (MCCC= * take BIO 122 [4])	4.0
CHEM 112 & CHEM 114	General Chemistry II (MCCC = * take CHE 122 [4])	5.5
MATH 102	Introduction to Analysis II (MCCC = *take MAT 162 [4])	4.0
Foreign Language (MCCC= *take Foreign Language [3])		4.0
	Term Credits	17.5

Second Year

Fall

At Community College		
ENVS 230	General Ecology (MCCC= BIO 256 [4])	3.0
GEO 306	Environmental Geology (MCCC = GLG 115 [4])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC = *take ENGL 102 [3])	6.0
ENSS Elective or Diversity Elective (MCCC = ECO 117 [3] or GEO 130 [3])		3.0
Elective (MCCC = CMS 110 [3] or CMS 120 [3])		3.0
COM 101 or 230	Human Communication (Humanities and Fine Arts Elective (MCCC = CMS 110 [3] or CMS 120 [3])) Techniques of Speaking	3.0
	Term Credits	22.0

Spring

At Community College		
ENSS 275	Global Climate Change (MCCC = GLG 125 [4])	3.0
ENVS 308 or ENSS Elective (MCCC= GEO 210 or GEO 220 [3])		3.0
MATH 107	Probability and Statistics for Liberal Arts (MCCC = MAT 130 [4])	3.0
Free Elective (MCCC= ESW 245 [3])		3.0
Foreign Language (MCCC = Foreign Language [3])		4.0
Excess free elective credits from semester to Drexel quarter credits		15.0
	Term Credits	31.0

Third Year

Fall

At Drexel		
ENVS 101	Introduction to Environmental Science	5.0
ENSS 120	Introduction to Environmental Studies	3.0
ENSS 283	Introduction to Environmental Policy	3.0
PSCI 110	American Government	4.0
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
	Term Credits	16.0

Winter

At Drexel		
PSCI 284	Environmental Politics	4.0
GEO 201 [WI]	Earth Systems Processes	3.0
PSY 101	General Psychology I	3.0
SOC 101 or ANTH 101	Introduction to Sociology Introduction to Cultural Diversity	3.0
Humanities/Fine Arts Elective		3.0
	Term Credits	16.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
SOC 355 [WI]	Classical Social Theory	4.0
ENSS 285	Introduction to Urban Planning	3.0
ECON 201	Principles of Microeconomics	4.0
UNIV H201	Looking Forward: Academics and Careers	1.0
SOC 241	Research Design: Qualitative Methods	4.0
	Term Credits	16.0

Winter

At Drexel		
ENSS 244	Sociology of the Environment	4.0
PHIL 340 or 341	Environmental Ethics Environmental Philosophy	3.0
SOC 242	Research Design: Quantitative Methods	4.0
ECON 202	Principles of Macroeconomics	4.0
	Term Credits	15.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel

ENVS 441 [WI]	Issues in Global Change I: Seminar	2.0
ENSS 346	Environmental Justice	4.0
ENSS Elective		3.0
SOC/Beh elective		3.0
Diversity Elective		3.0
	Term Credits	15.0

Winter

At Drexel

ENVS 442	Issues in Global Change II: Research	2.0
ENSS 326	Cities and Sustainability	3.0
ENSS Elective		3.0
Humanities/Fine Arts Elective		3.0
International Elective		3.0
	Term Credits	14.0

Spring

At Drexel

ENVS 443	Issues in Global Change III: Synthesis	2.0
ENSS Elective		4.0
ENSS Elective		3.0
Diversity Elective		3.0
	Term Credits	12.0

Total Credit: 194.0

Writing-Intensive Course Requirements

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Transfer Credits
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BS in General Studies

Drexel Degree Name: B.S. in General Studies

Community College Degree Name: A.A. in Liberal Arts

Sample Plan of Study - First & Second Year at Montgomery County Community College

60 Credits at MCCC transfer over as 90 Credits at Drexel

Please contact the Goodwin College of Professional Studies **(**https://drexel.edu/goodwin/academics/degree-completion-programs/transfer-credit-apl/**) for the most current Plan of Study.**

First Year

Fall		**Credits**
At Community College		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3])	3.0
COM 230	Techniques of Speaking (MCCC= Core Goal 1B: Oral Communication Skills [3])	3.0
MATH 100	Fundamentals of Mathematics (MCCC= Core Goal 3: Quantitative Skills [3])	3.0
PRST 211	Computer Applications for Professionals (MCCC= Core Goal 4: Computer Fluency [3])	3.0
Transfer Humanities Elective (MCCC= Core Goal 9: Behavior and Social Science [3])		4.5
	Term Credits	16.5

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 102 [3])	6.0
HIST 161	Themes in World Civilization I (MCCC= HIS 101 or HIS 102 [3])	4.0
Transfer Science Elective (MCCC= Core Goal 8: Physical and Life Sciences [4])		6.0
Transfer Free Elective (MCCC= Core Goal 10: Exercise and Health Sciences [2])		3.0
Transfer Humanities Elective (MCCC= Core Goal 7: Aesthetic Sensibility and the Arts [3])		4.5
	Term Credits	23.5

Second Year

Fall		
At Community College		
Transfer Free Elective (MCCC= Core Goal 11: Civic Responsibility [3])		4.5
Transfer Humanities Elective (MCCC= Core Goal 12: Global Perspectives and Diversity [3])		4.5
Transfer Humanities Elective (MCCC= Core Goal 13: Ethical Reasoning and Behavior [3])		4.5
Transfer Free Elective (MCCC= Elective [3])		4.5
Transfer Free Elective (MCCC= Elective [3])		4.5
	Term Credits	22.5

Spring		
At Community College		
Transfer Free Elective (MCCC= Elective [3])		4.5
Transfer Free Elective (MCCC= Elective [3])		4.5
Transfer Free Elective (MCCC= Elective [3])		4.5
Transfer Free Elective (MCCC= Elective [3])		4.5

Transfer Free Elective (MCCC= Elective [3])		4.5
	Term Credits	22.5

Third Year
Fall
At Drexel

GSTD 200	Lifelong Learning Theory & Practice	3.0
MATH 171	Introduction to Analysis A	3.0
Specialization		3.0
Free Elective		3.0
Liberal Study - Upper Level		3.0
undefined		
COOP 101	Career Management and Professional Development	0.0
	Term Credits	15.0

Winter
At Drexel

GSTD 201 [WI]	Professional Applications of Emotional Intelligence	3.0
Free Elective		4.0
Liberal Study		3.0
Specialization		3.0
Free Elective - Upper Level		3.0
	Term Credits	16.0

Spring
At Drexel
COOP EXPERIENCE

	Term Credits	0.0

Summer
At Drexel
COOP EXPERIENCE

	Term Credits	0.0

Fourth Year
Fall
At Drexel

GSTD 303	Client Relations Management	3.0
Specialization		3.0
Free Elective - Writing Intensive		3.0
Specialization - Upper Level		3.0
Specialization		3.0
	Term Credits	15.0

Winter
At Drexel

PRST 303	Interpersonal Skills for Virtual Teams	3.0
Specialization		3.0
Liberal Study - Upper Level		3.0
Free Elective		4.0
Specialization - Upper Level		3.0
	Term Credits	16.0

Spring
At Drexel
COOP EXPERIENCE

	Term Credits	0.0

Summer
At Drexel
COOP EXPERIENCE

	Term Credits	0.0

Fifth Year
Fall
At Drexel

GSTD 491	Senior Project in General Studies	3.0
Specialization - Upper Level		3.0
Free Elective - Upper Level		3.0
Specialization		3.0

Specialization		3.0
	Term Credits	15.0

Winter
At Drexel

Specialization		3.0
Free Elective - Writing Intensive		3.0
Specialization		3.0
Liberal Study - Upper Level		3.0
	Term Credits	12.0

Total Credit: 174.0

Transfer Credits

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Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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BA in History

Drexel Degree Name: B.A. History

Community College Degree Name: A.A in History

Sample Plan of Study - First & Second Year at Montgomery County Community College

62 Credits at MCCC transfer over as 90 Credits at Drexel

Please contact the Department of History **(**https://drexel.edu/coas/academics/departments-centers/history/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
HIST 161	Themes in World Civilization I (MCCC= HIS 101 [3])	4.0
MATH Elective (MCCC=MAT 103A, 106A, 140 or 190 [3])		3.0
Foreign Language (MCCC= Foreign Language [3])		4.0
PSY 101	General Psychology I (MCCC= PSY 101 [3])	3.0
	Term Credits	17.0

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 102 [3])	6.0
HIST 162	Themes in World Civilization II (MCCC= *take HIS 122 [3])	8.0
ANTH 101 or SOC 101	Introduction to Cultural Diversity (MCCC= ANT 101 or SOC 101 [3] Introduction to Sociology	3.0
Foreign Language (MCCC= Foreign Language Elective [3])		4.0
History Elective (MCCC= History Elective [3])		4.0
	Term Credits	25.0

Second Year

Fall		
At Community College		
COM 230	Techniques of Speaking (MCCC= SPC 120 [3])	3.0
PSCI 100	Introduction to Political Science (MCCC= POL 101 or POL 124 [3])	4.0
Science Elective (MCCC= BIO 121 [4] or CHE 121 [4] or PHY 121 [4])		4.0
HIST 201	United States History to 1815 (MCCC= HIS 203 [3])	4.0
History Elective (MCCC=History Elective [3])		4.0
	Term Credits	19.0

Spring		
At Community College		
HIST 202 & HIST 203	United States History, 1815-1900 (MCCC= HIS 205 [3])	8.0
Social Science Elective (MCCC = Geography [3])		3.0
Science Elective (MCCC= Lab Science [4])		4.0
Free Elective (MCCC = Technological Fluency Elective [3])		3.0
Humanities/Fine Arts elective (MCCC = Aesthetics Sensibility [3])		3.0
Excess free elective credits from semester to Drexel quarter credits		8.0
	Term Credits	29.0

Third Year

Fall

At Drexel

HIST 296	Research Methods in History I	4.0
Math		3.0
Foreign Language		4.0
History pre-1700		4.0
Humanities HFA		3.0
COOP 101	Career Management and Professional Development	0.0
	Term Credits	18.0

Winter		
At Drexel		
History/Science/Tech/Enviro		4.0
Foreign Language		4.0
History		4.0
Humanities HFA		3.0
	Term Credits	15.0

Spring		
At Drexel		
CO-OP		
	Term Credits	0.0

Summer		
At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall		
At Drexel		
HIST 301	The Study of History	4.0
History T380		4.0
HFA		3.0
History Elective		4.0
	Term Credits	15.0

Winter		
At Drexel		
HIST 396	Research Methods in History II	4.0
HIST non-US		4.0
History Elective		4.0
History Elective		4.0
	Term Credits	16.0

Spring		
At Drexel		
CO-OP		
	Term Credits	0.0

Summer		
At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall		
At Drexel		
HIST 490 [WI]	Senior Seminar I	4.0
History Elective		3.0
Diversity		3.0
INTL Studies		3.0
	Term Credits	13.0

Winter		
At Drexel		
HIST 491 [WI]	Senior Seminar II	4.0
Diversity		3.0
INTL Studies		3.0
Free Elective		3.0
	Term Credits	13.0

Spring

At Drexel	
Social Science	3.0
Humanities/Fine Arts Elective	3.0
History Elective	4.0
Free Elective	3.0
Term Credits	13.0

Total Credit: 193.0

Writing-Intensive Course Requirements

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Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Hospitality Management

Drexel Degree Name: B.A. in Hospitality Management

Community College Degree Name: A.A.S in Hospitality

Sample Plan of Study - First & Second Year at Montgomery County Community College

67 Credits at MCCC transfer over as 73.5 Credits at Drexel

Please contact the Department of Food and Hospitality Management **(**https://drexel.edu/cnhp/academics/departments/food-hospitality-management/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
CULA 115	Culinary Fundamentals (MCCC= CUL 101 [3])	3.0
HRM 110	Introduction to the Hospitality Industry (MCCC= CUL 102 [3])	3.0
CULA 120 & CULA 121	Techniques and Traditions I (MCCC= CUL 120 [3])	6.0
HRM 125	Hotel Operations Management (MCCC= HOS 111 [3])	3.0
INFO 101	Introduction to Computing and Security Technology (MCCC= OFM 101 [3])	3.0
MATH 100	Fundamentals of Mathematics (MCCC= ACC 110 [3])	3.0
	Term Credits	21.0

Spring		
At Community College		
HRM 150	Food & Beverage Customer Service (MCCC= CUL 114 [3])	3.0
HRM 220	Purchasing for the Hospitality Industry (MCCC= CUL 151 [3])	3.0
HRM 455	Hospitality Human Resources Management (MCCC= CUL 170 [3])	3.0
HRM 155	Hotel Customer Service (MCCC= HOS 185 [3])	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
PSY 101	General Psychology I (MCCC= PSY 137 [3])	3.0
	Term Credits	18.0

Second Year

Fall		
At Community College		
HRM 120	Principles of Food-Service Management (MCCC= CUL 220 [3])	3.0
HRM 165	Introduction to the Events Industry (MCCC= HOS 214 [3])	3.0
HRM 330	Hospitality Marketing and Branding (MCCC= HOS 231 [3])	3.0
HRM 130	Introduction to Tourism (MCCC= HOS 251 [3])	3.0
COM 230	Techniques of Speaking (MCCC= SPC 120 [3])	3.0
	Term Credits	15.0

Spring		
At Community College		
HRM 399	Hospitality Practicum Experience (MCCC= HOS 297 [3])	3.0
PHIL 105	Critical Reasoning (MCCC= MGT 210 [3])	3.0
NFS 100 & NFS 101	Nutrition, Foods, and Health (MCCC= ESW 206, ESW 207, ESW 245 [3])	3.0
Free Elective (MCCC= Any Core Goal 6: Intellectual Heritage Course [3])		4.5

Free Elective (MCCC= Any Core Goal 8: Physical and Life Science Course [4])		6.0
	Term Credits	19.5

Third Year

Fall

At Drexel

ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing / English Composition II	3.0
MATH 181	Mathematical Analysis I	0.0-3.0
FDSC 100	ServSafe	1.0
HRM 160	Laws of the Hospitality Industry	3.0
HRM 370	Gaming and Casino Management I	3.0
HRM 190	Industry Hours I	1.0
	Term Credits	11.0-14.0

Winter

At Drexel

ENGL 103 or 113	Composition and Rhetoric III: Themes and Genres / English Composition III	3.0
MATH 182	Mathematical Analysis II	3.0
HRM 131	Tourism Geography	3.0
HRM 215	Commercial Food Production	4.0
HRM 371	Gaming and Casino Management II	3.0
HRM 290	Industry Hours II	1.0
	Term Credits	17.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fourth Year

Fall

At Drexel

MATH 107	Probability and Statistics for Liberal Arts	3.0
HRM 390	Industry Hours III	1.0
Social Science		3.0
Language		4.0
ACCT 110	Accounting for Professionals	4.0
HRM 355	Resort Management	3.0
	Term Credits	18.0

Winter

At Drexel

HRM 490	Industry Hours IV	1.0
Language		4.0
MIS 200	Management Information Systems	4.0
HRM 425	Hospitality Industry Administration	3.0
ECON 201	Principles of Microeconomics	4.0
	Term Credits	16.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

HRM 495	Industry Hours V	1.0
Language		4.0
MKTG 201	Introduction to Marketing Management	4.0
COM 181	Public Relations Principles and Theory	3.0
HRM 335	Beverage Management	3.0
	Term Credits	15.0

Winter

At Drexel

ORGB 300 [WI]	Organizational Behavior	4.0
COM 270 [WI]	Business Communication	3.0
Social Science		3.0
HRM 450	Hospitality Leadership Seminar	3.0
Business Course		4.0
	Term Credits	17.0

Total Credit: 167.5-170.5

Writing-Intensive Course Requirements

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Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Materials Science and Engineering

Drexel Degree Name: B.S in Material Science and Engineering

Community College Degree Name: A.S in Engineering Science

Sample Plan of Study - First & Second Year at Montgomery County Community College

63 Credits at MCCC transfer over as 77-78.5 Credits at Drexel

Please contact the Department of Materials Science and Engineering **(**https://drexel.edu/engineering/academics/departments/materials-science-engineering/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis (MCCC= EGR 111 [3]) + (MCCC= EGR 102 [3])	3.0
MATH 121	Calculus I (MCCC= MAT 190 [4])	4.0
PHYS 101	Fundamentals of Physics I (MCCC= PHY 151 [4])	4.0
	Term Credits	14.0

Spring

At Community College		
COM 230	Techniques of Speaking (MCCC= SPC 120 [3])	3.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 102 [3])	6.0
MATH 122 & MATH 123	Calculus II (MCCC= MAT 201 [4])	8.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (MCCC= PHY 152 [4])	8.0
Excess Transfer Credit		1.5
	Term Credits	26.5

Second Year

Fall

At Community College		
CHEM 101	General Chemistry I (MCCC= CHE 151 [4])	3.5
ECE 201	Foundations of Electric Circuits I (MCCC= EGR 211 [4])	4.0
MATH 210	Differential Equations (MCCC= MAT 223 [4])	4.0
Transfer Free Elective (MCCC= Core Goal 10; Exercise and Health Science [2-3])		3.0-4.5
	Term Credits	14.5-16.0

Spring

At Community College		
CHEM 102	General Chemistry II (MCCC= CHE 152 [4])	4.5
HIST 161	Themes in World Civilization I (MCCC= HIS 101 [3])	4.0
MATH 200	Multivariate Calculus (MCCC= MAT 202 [4])	4.0
PHIL 251	Ethics (MCCC= PHI 101 [3])	3.0
Transfer Free Elective (MCCC= EGR 214 [4])		4.5
Excess Transfer Free Elective Credit		2.0
	Term Credits	22.0

Third Year

Fall

At Drexel		
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
COOP 101	Career Management and Professional Development	0.0
ENGR 113	First-Year Engineering Design	3.0
ENGR 220	Fundamentals of Materials	4.0
MATH 201 or ENGR 231	Linear Algebra Linear Engineering Systems	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	16.0

Winter

At Drexel		
CHEM 241	Organic Chemistry I	4.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 131	Introductory Programming for Engineers	3.0
ENGR 210	Introduction to Thermodynamics	3.0
MATE 230	Fundamentals of Materials II	4.0
	Term Credits	15.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
ECON 201	Principles of Microeconomics	4.0
MATE 214	Introduction to Polymers	4.0
MATE 240	Thermodynamics of Materials	4.0
MATE 355	Structure and Characterization of Crystalline Materials	3.0
MATE 370	Mechanical Behavior of Solids	3.0
	Term Credits	18.0

Winter

At Drexel		
ECON 202	Principles of Macroeconomics	4.0
MATE 245	Kinetics of Materials	4.0
MATE 315	Processing Polymers	0.0-4.5
MATE 341	Defects in Solids	3.0
	Term Credits	11.0-15.5

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel		
MATE 280	Advanced Materials Laboratory	4.0
MATE 366 [WI]	Processing of Metallic Materials	4.5
MATE 455	Biomedical Materials	3.0
Tech/Track Elective		3.0
	Term Credits	14.5

Winter

At Drexel		
CHEC 353	Physical Chemistry and Applications III	4.0
MATE 345	Processing of Ceramics	4.5
MATE 351	Electronic and Photonic Properties of Materials	4.0
PHIL 315	Engineering Ethics	3.0
	Term Credits	15.5
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Sixth Year		
Fall		
At Drexel		
CHE 350	Statistics and Design of Experiments	3.0
MATE 460	Engineering Computational Laboratory	4.0
MATE 491 [WI]	Senior Project Design I	2.0
Tech/Track Elective		3.0
	Term Credits	12.0
Winter		
At Drexel		
MATE 492	Senior Project Design II	3.0
Tech/Track Elective		3.0
	Term Credits	6.0
Spring		
At Drexel		
MATE 410	Case Studies in Materials	3.0
MATE 493 [WI]	Senior Project Design III	3.0
Tech/Track Elective		3.0
	Term Credits	9.0

Total Credit: 194.0-200.0

Writing-Intensive Course Requirements

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Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Mechanical Engineering

Drexel Degree Name: B.S in Mechanical Engineering

Community College Degree Name: A.S in Engineering Science; Electrical OR Mechanical Engineering Concentration

Sample Plan of Study - First & Second Year at Montgomery County Community College

67 Credits at MCCC transfer over as 85-86.5 Credits at Drexel

Please contact the Department of Mechanical Engineering and Mechanics **(**https://drexel.edu/engineering/academics/departments/mechanical-engineering/**) for the most current Plan of Study.**

First Year

Fall		**Credits**
At Community College		
CS 190	Selected Computer Language (MCCC= EGR 111 [3])	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
ENGR 111 or 131[*]	Introduction to Engineering Design & Data Analysis (MCCC= EGR 102 [3]) Introductory Programming for Engineers	3.0
MATH 121	Calculus I (MCCC= MAT 190 [4])	4.0
PHYS 101	Fundamentals of Physics I (MCCC= PHY 151 [4])	4.0
	Term Credits	17.0

Spring		
At Community College		
COM 230	Techniques of Speaking (MCCC= SPC 120 [3])	4.5
and Transfer Free Elective		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 102 [3])	6.0
MATH 122 & MATH 123	Calculus II (MCCC= MAT 201 [4])	8.0
MEM 201	Foundations of Computer Aided Design (MCCC= EGR 115 [3])	3.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (MCCC= PHY 152 [4])	8.0
	Term Credits	29.5

Second Year

Fall		
At Community College		
CHEM 101	General Chemistry I (MCCC= CHE 151 [4])	3.5

ECE 201	Foundations of Electric Circuits I (MCCC= EGR 211 [4])	4.0
MATH 200	Multivariate Calculus (MCCC= MAT 202 [4])	4.0
MEM 202	Statics (MCCC= EGR 203 [3])	3.0
TGFE 099 (MCCC= Core Goal 10; Exercise and Health Science [2-3])		3.0-4.5
	Term Credits	17.5-19.0

Spring

At Community College

HIST 161	Themes in World Civilization I (MCCC= HIS 101 [3])	4.5
and Transfer Free Elective		
MATH 210	Differential Equations (MCCC= MAT 223 [4])	4.0
MEM 230	Mechanics of Materials I (MCCC= EGR 213 [3])	4.0
MEM 238	Dynamics (MCCC= EGR 204 [3])	4.0
PHIL 251	Ethics (MCCC= PHI 101 [3])	4.5
and Transfer Free Elective		
	Term Credits	21.0

Third Year

Fall

At Drexel

ENGR 113	First-Year Engineering Design	3.0
ENGR 220	Fundamentals of Materials	4.0
HIST 285	Technology in Historical Perspective	4.0
MATH 201	Linear Algebra	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	16.0

Winter

At Drexel

CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 210	Introduction to Thermodynamics	3.0
MEM 255	Introduction to Controls	4.0
MEM 331	Experimental Mechanics I	2.0
MEM 333	Mechanical Behavior of Materials	3.0
	Term Credits	17.5

Spring

At Drexel

CO-OP

PHIL 315	Engineering Ethics	3.0
	Term Credits	3.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fourth Year

Fall

At Drexel

MEM 310	Thermodynamic Analysis I	4.0
MEM 345	Heat Transfer	4.0
MEM 355	Performance Enhancement of Dynamic Systems	4.0
MEM 435	Introduction to Computer-Aided Design and Manufacturing	4.0
MEM Fundamental Course		3.0
	Term Credits	19.0

Winter

At Drexel

CIVE 240 [WI]	Engineering Economic Analysis	3.0
MEM 220	Fluid Mechanics I	4.0
MEM 351	Dynamic Systems Laboratory I	2.0
MEM 391	Introduction to Engineering Design Methods	1.0
MEM Fundamental Course		3.0
MEM Fundamental Course		3.0
	Term Credits	16.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

MEM 311	Thermal Fluid Science Laboratory	2.0
MEM 491 [WI]	Senior Design Project I	2.0
MEM or COE Elective		3.0
MEM Fundamental Course		3.0
MATH/SCI Course		3.0
	Term Credits	13.0

Winter

At Drexel

MEM 361	Engineering Reliability	3.0
MEM 492 [WI]	Senior Design Project II	3.0
MEM Elective 300+		3.0
MEM or COE Elective		3.0
MATH/Science Course		3.0
	Term Credits	15.0

Spring

At Drexel

CIVE 240 [WI]	Engineering Economic Analysis	3.0
BIO 141	Essential Biology	4.5
MEM 493 [WI]	Senior Design Project III	3.0
MEM Elective 300+		
	Term Credits	10.5

Total Credit: 195.0-196.5

*   Along with EGR 111 = ENGR 111

Writing-Intensive Course Requirements

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Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Psychology

Drexel Degree Name: B.S. Psychology

Community College Degree Name: A.S in Psychology

Sample Plan of Study - First & Second Year at Montgomery County Community College

61 Credits at MCCC Transfers as 90 Credits to Drexel

Contact the Department of Psychology (https://drexel.edu/coas/academics/departments-centers/psychology/) for the most current Plan of Study

First Year

Fall

		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (MCCC= ENG 101 [3]) English Composition I	3.0
HIST 161	Themes in World Civilization I (MCCC= HIS 101 [3])	4.0
MATH 101	Introduction to Analysis I (MCCC= MAT 106 [3])	4.0
PSY 101	General Psychology I (MCCC= PSY 101 [3])	3.0
Free Electives (MCCC= Technological Fluency Elective [3])		3.0
	Term Credits	17.0

Spring

At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (MCCC= ENG 102 [3])	6.0
HIST 162	Themes in World Civilization II (MCCC= HIS 102 [3])	4.0
SOC 101	Introduction to Sociology (MCCC= SOC 101 or ANT 104 [3])	3.0
PSY 120	Developmental Psychology (MCCC= PSY 206 [3])	3.0
PSY Elective (PSY Elective [3])		3.0
	Term Credits	19.0

Second Year

Fall

At Community College		
COM 230	Techniques of Speaking (MCCC= CMS 110 or CMS 120 [3])	3.0
PSCI 110	American Government (MCCC= POL 124 [3])	4.0
BIO 107 & BIO 108	Cells, Genetics & Physiology (MCCC= BIO 120 or BIO 121 [4])	4.0
STAT 201	Introduction to Business Statistics (MCCC= MATH 130 [3])	4.0
PSY 240 [WI]	Abnormal Psychology (MCCC= PSY 215 [3])	3.0
	Term Credits	18.0

Spring

At Community College		
PSY Elective (MCCC= PSY 231 [3])		3.0
PSY Elective (MCCC= PSY Elective [3])		3.0
PSY Elective (MCCC= PSY Elective [3])		3.0
Free Elective (MCCC= Foreign Language [3])		4.0
Free Elective (MCCC= Aesthetic Sensibility Elective [3])		3.0
Excess Free Elective Credit from Semester to Drexel credits		20.0
	Term Credits	36.0

Third Year

Fall

At Drexel		
COOP 101	Career Management and Professional Development	0.0
PSY 140	Approaches to Personality	3.0
PSY 150	Introduction to Social Psychology	3.0
PSY 264	Computer-Assisted Data Analysis I	3.0
PSY 290	History and Systems of Psychology	3.0
Fine Arts Elective		3.0
	Term Credits	15.0

Winter

At Drexel		
PSY Elective		3.0
CIVC 101	Introduction to Civic Engagement	1.0
PSY 265	Computer-Assisted Data Analysis II	3.0
BIO 109 & BIO 110	Biological Diversity, Ecology & Evolution	4.0
MATH 102	Introduction to Analysis II	4.0
	Term Credits	15.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
PSY 212	Physiological Psychology	3.0
PSY 360 [WI]	Experimental Psychology	3.0
PSY Elective		3.0
PSY Elective		3.0
PSY 325	Psychology of Learning	3.0
	Term Credits	15.0

Winter

At Drexel		
PSY Elective		3.0
Anthropology or Sociology Elective		3.0
PSY 330	Cognitive Psychology	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
PSY 280	Psychological Research I	3.0
Free Elective		3.0
	Term Credits	16.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
Literature Elective		3.0
Philosophy Elective		3.0
PSY 380	Psychological Testing and Assessment	3.0
Free Elective		3.0
Free Elective		3.0
	Term Credits	15.0
Winter		
At Drexel		
Literature Elective		3.0
Free Elective		4.0
Free Elective		4.0
Free Elective		3.0
	Term Credits	14.0

Total Credit: 180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

Rowan College at Burlington County

Degree Programs in the Close School of Entrepreneurship

Degree Programs in the College of Arts and Sciences

Degree Programs in the College of Business

Degree Programs in the College of Engineering

Degree Programs in the College of Nursing and Health Professions

Degree Programs in the Goodwin College of Professional Studies

BA in Communication - Open Concentration

Drexel Degree Name: B.A. Communication, Open Concentration

Community College Degree Name: A.A in Communication Arts

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

Please contact the Department of Communication **(**https://drexel.edu/coas/academics/departments-centers/communication/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC fulfilled by=ENG 101 [3]) English Composition I	3.0
MATH Elective (RCBC=Mathematics [3])		3.0
PSCI 110	American Government (RCBC=POL 101 [3])	4.0
ENGL T280	Special Topics in English (RCBC=ENG 252 [3])	3.0
HIST Elective (RCBC=History Elective [3])		4.0
	Term Credits	17.0

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC=ENG 102 [3])	6.0
Arts & Humanities Elective (RCBC=Arts & Humanities [3])		3.0
CS 161	Introduction to Computing (RCBC=CIS 101 or CIS 161 [3])	3.0
COM 246	Media and Identity (RCBC=SOC 207 [3])	3.0
Free Elective (RCBC=Technology [3])		3.0
Social Science Elective (RCBC=Social Science [3])		3.0
	Term Credits	21.0

Second Year

Fall		
At Community College		
COM 230	Techniques of Speaking (RCBC=SPE 102 [3])	3.0
Science Elective (RCBC=Natural Science [3-4])		4.0
COM Elective (RCBC=Program Elective [3])		3.0
Diversity Elective (RCBC=Diversity Course [3])		3.0
History Elective (RCBC=History Elective [3])		4.0
Arts & Humanities Elective (RCBC=Arts & Humanities [3])		3.0
	Term Credits	20.0

Spring		
At Community College		
Arts & Humanities (RCBC=Arts & Humanities [3])		3.0
Science Elective (RCBC=Natural Science [3-4])		4.0
COM Elective (RCBC=Program Elective [3])		3.0
Free Elective (RCBC=Elective [3])		3.0
Free Elective (RCBC=Elective [3])		3.0
Excess Free Elective Credit (from semester to quarter conversion)		16.0
	Term Credits	32.0

Third Year

Fall

At Drexel

COM 101	Human Communication	3.0
COOP 101	Career Management and Professional Development	0.0
COM 181	Public Relations Principles and Theory	3.0
COM 150	Mass Media and Society	3.0
Modern Language		4.0
Mathematics		3.0
	Term Credits	16.0

Winter

At Drexel

COM 210	Theory and Models of Communication	3.0
COM 160	Introduction to Journalism	3.0
COM 240	New Technologies In Communication	3.0
PSY 101	General Psychology I	3.0
CIVC 101	Introduction to Civic Engagement	1.0
Modern Language		4.0
	Term Credits	17.0

Spring

At Drexel

CO-OP		
	Term Credits	0.0

Summer

At Drexel

CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel

COM 220	Qualitative Research Methods	3.0
LING 102	Language and Society	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
COM Elective		3.0
Modern Language		4.0
	Term Credits	14.0

Winter

At Drexel

COM 282 [WI]	Public Relations Writing	3.0
COM 221	Quantitative Research Methods in Communication	3.0
COM 300+ Elective		3.0
Diversity Elective		3.0
International Elective		3.0
	Term Credits	15.0

Spring

At Drexel

CO-OP		
	Term Credits	0.0

Summer

At Drexel

CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel

COM 491	Senior Project in Communication I	3.0
COM 300+ Elective		3.0
Social Science Elective		3.0
International Elective		3.0
	Term Credits	12.0

Winter

At Drexel

COM 492	Senior Project in Communication II	3.0
PHIL 305	Ethics and the Media	3.0
COM Elective		3.0
COM Elective		3.0
COM Elective		3.0
	Term Credits	15.0

Spring

COM 400	Seminar in Communication	3.0
COM 310 [WI]	Technical Communication	3.0
Interpersonal Communication		3.0
Social Media in Communication		3.0
COM Elective		3.0
	Term Credits	15.0

Total Credit: 194.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BA in Communication - Journalism Concentration

Drexel Degree Name: B.A. Communication, Journalism Concentration

Community College Degree Name: A.A in Communication Arts

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

63 Credits at RCBC transfer over as 90 Credits at Drexel

Please contact the Department of Communication (https://drexel.edu/coas/academics/departments-centers/communication/) for the most current Plan of Study.

First Year

Fall

		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC=ENG 101 [3]) English Composition I	3.0
Math Elective (RCBC=Mathematics [3])		3.0
PSCI 110	American Government (RCBC=POL 101 [3])	4.0
ENGL T280	Special Topics in English (RCBC=ENG 252 [3])	3.0
HIST Elective (RCBC=History Elective [3])		3.0
	Term Credits	16.0

Spring

At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC=ENG 102 [3])	6.0
Arts & Humanities (RCBC=Arts and Humanities [3])		3.0
COM 246	Media and Identity (RCBC=SOC 207 [3])	3.0
Free Elective (RCBC=Technology [3])		3.0
Social Science Elective (RCBC=Social Science [3])		3.0
CS 161	Introduction to Computing (RCBC=CIS 101 [3])	3.0
	Term Credits	21.0

Second Year

Fall

At Community College		
COM 230	Techniques of Speaking (RCBC=SPE 102 [3])	3.0
Science Elective (RCBC=Natural Science [3-4])		4.0
COM Elective (RCBC=Program Elective [3])		3.0
Free Elective (RCBC=Diversity Course [3])		3.0
History Elective (RCBC=History Elective [3])		4.0
Arts & Humanities Elective (RCBC=Arts & Humanities [3])		3.0
	Term Credits	20.0

Spring

At Community College		
Arts & Humanities (RCBC=Arts & Humanities [3])		3.0
Science Elective (RCBC=Natural Science [3-4])		4.0
COM Elective (RCBC=Program Elective [3])		3.0
Free Elective (RCBC=Elective [3])		3.0
Free Elective (RCBC=Elective [3])		3.0

Excess Free Elective Credit (from semester to quarter conversion)		17.0
	Term Credits	33.0

Third Year

Fall

At Drexel		
COM 101	Human Communication	3.0
COM 160	Introduction to Journalism	3.0
COM 150	Mass Media and Society	3.0
COOP 101	Career Management and Professional Development	0.0
Mathematics		3.0
Modern Language		4.0
	Term Credits	16.0

Winter

At Drexel		
COM 261	Advanced Journalism	3.0
COM 210	Theory and Models of Communication	3.0
CIVC 101	Introduction to Civic Engagement	1.0
COM 181	Public Relations Principles and Theory	3.0
Modern Language		4.0
	Term Credits	14.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
COM 220	Qualitative Research Methods	3.0
COM 266	Copy Editing for the Media	3.0
COM 365	Journalists, the Courts, and the Law	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Interpersonal Communication		3.0
Modern Language		4.0
	Term Credits	17.0

Winter

At Drexel		
COM 221	Quantitative Research Methods in Communication	3.0
COM 315	Investigative Journalism	3.0
PSY 101	General Psychology I	3.0
Social Media in Communication		3.0
International Elective		3.0
	Term Credits	15.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel		
COM 491	Senior Project in Communication I	3.0
TVPR 220	TV News Writing	3.0
LING 102	Language and Society	3.0
COM Elective		3.0

		Credits
Social Science Elective		3.0
	Term Credits	15.0
Winter		
At Drexel		
COM 492	Senior Project in Communication II	3.0
COM 240	New Technologies In Communication	3.0
Diversity Elective		3.0
International Elective		3.0
	Term Credits	12.0
Spring		
COM 400	Seminar in Communication	3.0
PHIL 305	Ethics and the Media	3.0
COM Elective		3.0
COM Elective		3.0
Diversity Elective		3.0
	Term Credits	15.0

Total Credit: 194.0

Transfer Credits

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BA in Communication - Public Relations

Drexel Degree Name: B.A. Communication, Public Relations Concentration

Community College Degree Name: A.A in Communication Arts

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

66 Credits at RCBC transfer over as 88-90 Credits at Drexel

Please contact the Department of Communication **(**https://drexel.edu/coas/academics/departments-centers/communication/**) for the most current Plan of Study.**

First Year

Fall		**Credits**
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC=ENG 101 [3]) English Composition I	3.0
PSCI 110	American Government (RCBC=POL 101 [3])	4.0
ENGL T280	Special Topics in English (RCBC=ENG 252 [3])	3.0
MATH Elective (RCBC=Mathematics [3])		3.0-4.0
HIST Elective (RCBC=History Elective [3])		4.0
	Term Credits	17.0-18.0
Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC=ENG 102 [3])	6.0
COM 246	Media and Identity (RCBC=SOC 207 [3])	3.0
CS 161	Introduction to Computing (RCBC=CIS 101 or CIS 161 [3])	3.0
Arts & Humanities Elective (RCBC=Arts & Humanities [3])		3.0
Social Science Elective (RCBC=Social Science [3])		3.0
Free Elective (RCBC=Technology [3])		3.0
	Term Credits	21.0

Second Year

Fall		
At Community College		
COM 230	Techniques of Speaking (RCBC=SPE 102 [3])	3.0
Science Elective (RCBC=Natural Science [3-4])		4.0
COM Elective (RCBC=Program Elective [3])		3.0
Diversity Elective (RCBC=Diversity Course [3])		3.0
History Elective (RCBC=History Elective [3])		4.0
Arts & Humanities Elective (RCBC=Arts & Humanities [3])		3.0
	Term Credits	20.0
Spring		
At Community College		
Arts & Humanities Elective (RCBC=Arts & Humanities [3])		3.0
Science Elective (RCBC=Natural Science [3-4])		3.0-4.0
COM Elective (RCBC=Program Elective [3])		3.0
Free Elective (RCBC=Elective [3])		3.0
Free Elective (RCBC=Elective [3])		3.0
Excess Free Elective Credit (from semester to quarter conversion)		15.0
	Term Credits	30.0-31.0

Third Year

Fall		
At Drexel		
COM 101	Human Communication	3.0
COM 181	Public Relations Principles and Theory	3.0
COM 150	Mass Media and Society	3.0
CIVC 101	Introduction to Civic Engagement	1.0
COOP 101	Career Management and Professional Development	0.0
Modern Language		4.0
	Term Credits	14.0
Winter		
At Drexel		
COM 210	Theory and Models of Communication	3.0
COM 160	Introduction to Journalism	3.0
COM Elective		3.0
Modern Language		4.0
Math Elective		3.0
	Term Credits	16.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall		
At Drexel		

COM 220	Qualitative Research Methods	3.0
COM 282 [WI]	Public Relations Writing	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Interpersonal Communication		3.0
Modern Language		4.0
	Term Credits	14.0
Winter		
At Drexel		
COM 282 [WI]	Public Relations Writing	3.0
COM 284	Public Relations Research, Measurement and Evaluation	3.0
PSY 101	General Psychology I	3.0
LING 102	Language and Society	3.0
	Term Credits	12.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
COM 400	Seminar in Communication	3.0
COM 286	Public Relations Strategies and Tactics	3.0
COM 240	New Technologies In Communication	3.0
COM Elective		3.0
Social Science Elective		3.0
	Term Credits	15.0
Winter		
At Drexel		
COM 491	Senior Project in Communication I	3.0
COM 386	Public Relations Campaign Planning	3.0
MKTG 201	Introduction to Marketing Management	4.0
COM 335 or 340	Digital Publishing Desktop Publishing	3.0
International Elective		3.0
	Term Credits	16.0
Spring		
At Drexel		
COM 492	Senior Project in Communication II	3.0
PHIL 305	Ethics and the Media	3.0
Diversity Elective		3.0
Social Media in Communication		3.0
International Elective		3.0
	Term Credits	15.0

Total Credit: 190.0-192.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BA in English

Drexel Degree Name: B.A. English

Community College Degree Name: A.A in English

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

60 Credits at RCBC transfer over as 81-89.5 Credits at Drexel

Please contact the Department of English & Philosophy **(**https://drexel.edu/coas/academics/departments-centers/english-philosophy/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3]) English Composition I	3.0
MATH Elective (RCBC= Mathematics [3])		3.0-4.0
ENGL 211 [WI]	British Literature I (RCBC= LIT 207 [3])	3.0
Social and Behavioral Science (RCBC= Social Science [3])		3.0
Social and Behavioral Science (RCBC= History course [3])		3.0-4.0
Foreign Language (RCBC= *Take foreign language for Arts & Humanities elective [3])		4.0
	Term Credits	19.0-21.0
Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3])	6.0
Social and Behavioral Science course (RCBC = Social Science [3])		3.0
CS 164 or 161	Introduction to Computer Science (RCBC= *Take CIS 161 [3]) Introduction to Computing	3.0
Foreign Language (RCBC= *Take foreign language for Arts & Humanities elective [3])		4.0

ENGL 212	British Literature II (RCBC= LIT 208 [3])	3.0
Humanities course (RCBC = Arts & Humanities course [3])		3.0
	Term Credits	22.0

Second Year
Fall
At Community College

COM 230	Techniques of Speaking (RCBC= SPE 102 [3])	3.0
ENGL 205 [WI]	American Literature I (RCBC= LIT 209 [3])	3.0
Science Course (RCBC = Natural Science course [3-4])		3.0-4.0
Studies in Diversity course (RCBC = Diversity course [3])		3.0
	Term Credits	12.0-13.0

Spring
At Community College

ENGL 206 [WI]	American Literature II (RCBC= LIT 210 [3])	3.0
Science Course (RCBC = Natural Science course [3-4])		3.0-4.0
History Elective (RCBC= History [3])		3.0
ENGL elective (RCBC = *Take LIT elective [3])		3.0
Excess free elective credits from semester to Drexel credits		16.0-20.5
	Term Credits	28.0-33.5

Third Year
Fall
At Drexel

Mathematics Course		3.0-4.0
ENGL 310-335		3.0
Foreign Language Course: Completing Level 201		4.0
International Studies Elective		3.0
COOP 101	Career Management and Professional Development	0.0
	Term Credits	13.0-14.0

Winter
At Drexel

ENGL 200-216		3.0
ENGL 305-395		3.0
Foreign Language Course: Completing Level 201		4.0
Studies in Diversity Elective		3.0
	Term Credits	13.0

Spring
At Drexel
CO-OP

Term Credits	0.0

Summer
At Drexel
CO-OP

Term Credits	0.0

Fourth Year
Fall
At Drexel

ENGL 315 [WI]	Shakespeare	3.0
ENGL 200-216		3.0
International Studies Elective		3.0
ENGL 305-395		3.0
Free Elective		3.0
	Term Credits	15.0

Winter
At Drexel

ENGL 380	Literary Theory	3.0
ENGL 200-216		3.0
ENGL 310-335		3.0
Creative & Professional Writing Course		3.0
Free Elective		3.0
	Term Credits	15.0

Spring
At Drexel
CO-OP

Term Credits	0.0

Summer
At Drexel
CO-OP

Term Credits	0.0

Fifth Year
Fall
At Drexel

ENGL 490	Seminar in English and American Literature	4.0
ENGL 310-335		3.0
Creative & Professional Writing Course		3.0
Science & Tech Humanities Course		3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
	Term Credits	14.0

Winter
At Drexel

ENGL 492	Seminar in World Literature	4.0
ENGL 305-395		3.0
Creative & Professional Writing Course		3.0
Science & Tech Humanities Course		3.0
Free Elective		3.0
	Term Credits	16.0

Spring
At Drexel

ENGL 495	Senior Project in Literature	3.0
Science & Tech Humanities Course		3.0
Creative & Professional Writing Course		3.0
Science & Tech Humanities Course		3.0
	Term Credits	12.0

Total Credit: 179.0-188.5

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BA in Entrepreneurship and Innovation

Drexel Degree Name: B.A. in Entrepreneurship and Innovation

Community College Degree Name: A.S in Liberal Arts and Sciences

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

60 Credits at RCBC transfer over as 76 Credits at Drexel

Please contact the Close School of Entrepreneurship **(**https://drexel.edu/close/academics/undergraduate/BA-entrepreneurship-innovation/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
ECON 201	Principles of Microeconomics (RCBC= Social Science; ECON 203 [3])	4.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3]) English Composition I	3.0
MATH 100	Fundamentals of Mathematics (RCBC= Mathematics; recommend MTH 107 or MTH 111 [3])	3.0
Science requirment (RCBC= Natural Science; recommend BIO, CHEM, PHYS [3-4])		4.0
Any foreign language at 101-level (RCBC= Free elective; any foreign language at 101-level [3])		4.0
	Term Credits	18.0

Spring

At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC ENG 102 [3])	6.0
MATH 101	Introduction to Analysis I (RCBC= Program course; recommend MTH 112 or 113 [3])	4.0
Any foreign language at 102-level in sequence to prior language course taken (RCBC= Free elective; any foreign language at 102-level [3])		8.0
Science Requirement (RCBC= Natural Science [3-4])		4.0
Social/Behavioral (RCBC= History Course [3])		3.0
	Term Credits	25.0

Second Year

Fall

At Community College		
ACCT 120	Accounting Essentials for New Ventures (RCBC= Program Course; recommend ACCT 112 [3])	4.0
COM 230	Techniques of Speaking (RCBC= Program Course; Recommend SPE 102 [3])	3.0
PHIL 105	Critical Reasoning (RCBC= Elective; recommend PHI 105 [3])	3.0
Social/Behavioral (RCBC= Social Science [3])		3.0
Technology Elective (RCBC= Program Course; recommend CIS 101 or 111 [3])		3.0
	Term Credits	16.0

Spring

At Community College		
BLAW 346	Entrepreneurial Law (RCBC= Program course; BUA 205 [3])	4.0
MKTG 201	Introduction to Marketing Management (RCBC Program Course; BUA 220 [3])	4.0
Ethics (RCBC= Program Course; recommend PHI 205 [3])		3.0
Humanities/Fine Arts (RCBC= Diversity elective, recommend LIT 203, 206, 211, 216, 270 or PHI 112 [3])		3.0
Humanities/Fine Arts (RCBC= Arts & Humanities [3])		3.0
	Term Credits	17.0

Third Year

Fall

At Drexel		
ENTP 100	Innovation Ecosystem	1.0
ENTP 105	Entrepreneurship Practice & Mindset	3.0
ENTP 250	Ideation	3.0
ENTP 225 [WI]	Mindfulness & Wellbeing	3.0
Required minor course		3.0
Free elective		3.0
	Term Credits	16.0

Winter

At Drexel		
CIVC 101	Introduction to Civic Engagement	1.0
ENTP 101	Life Strategies I	3.0
ENTP 205	Ready, Set, Fail	3.0
Required minor courses		6.0
Entrepreneurship elective		3.0
	Term Credits	16.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
Concentration requirement		3.0
Entrepreneurship elective		3.0
Fine Arts/Humanities course		3.0
Required minor course		3.0
Technology course		3.0
	Term Credits	15.0

Winter

At Drexel		
Concentration requirement		3.0
Entrepreneurship elective		3.0
Free elective		3.0
Non-major writing-intensive course		3.0
Required minor course		3.0
	Term Credits	15.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

ENTP 410 [WI]	Thought Leadership	3.0
Concentration requirement		3.0
Entrepreneurship elective		3.0
Free elective		3.0
Required minor course		3.0
	Term Credits	15.0

Winter

At Drexel

Concentration requirement		3.0
Ethics course		3.0
Free electives		6.0
Required minor course		3.0
	Term Credits	15.0

Spring

At Drexel

ENTP 215	Building Entrepreneurial Teams	3.0
Required minor course		3.0
Free electives		6.0
Entrepreneurship elective		3.0
	Term Credits	15.0

Total Credit: 183.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must

have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BA in Philosophy

Drexel Degree Name: B.A. Philosophy

Community College Degree Name: A.A in Philosophy

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

60 Credits at RCBC transfer over as 86-90 Credits at Drexel

Please contact the Department of English & Philosophy **(**https://drexel.edu/coas/academics/departments-centers/english-philosophy/**) for the most current Plan of Study.**

First Year

Fall		**Credits**
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3]) English Composition I	3.0
MATH Elective (RCBC= Mathematics 107 or higher [3])		3.0
PHIL 105 or 102	Critical Reasoning (RCBC= PHIL 105 or PHIL 112 [3]) Introduction to Eastern Philosophy	3.0
History Elective (RCBC= History [3])		4.0
Social Science elective (RCBC=*ECO not recommended)		3.0-4.0
	Term Credits	16.0-17.0

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3])	6.0
PHIL 101	Introduction to Western Philosophy (RCBC = Arts and Humanities, PHI 101 [3] required)	3.0
CS 164	Introduction to Computer Science (RCBC= *take CIS 161 [3])	3.0
PHIL 251	Ethics (RCBC= PHI 205 [3])	3.0
Social Science elective (RCBC = Social Science [3], ECO not recommended)		3.0-4.0
ARTH 101	History of Art I: Ancient to Medieval (RCBC = Arts and Humanities *take ART 250 [3])	3.0
	Term Credits	21.0-22.0

Second Year

Fall		
At Community College		
COM 230	Techniques of Speaking (RCBC= SPE 102 [3])	3.0
Natural Science Elective (RCBC= Natural Science [3-4])		3.0-4.0
PHIL 340 or T280	Environmental Ethics (RCBC= PHI 220 [3] or PHI 210 [3]) Special Topics in Philosophy	3.0
ANTH 101	Introduction to Cultural Diversity (RCBC= *take ANTH 102 for Diversity Course [3])	3.0
Elective (RCBC + *take foreign language [3])		4.0
	Term Credits	16.0-17.0

Spring

At Community College		
ARTH 102 & ARTH 103	History of Art II: Renaissance to Romanticism (RCBC= *take ART 251[3] for Arts & Humanities [3])	6.0
Natural Science Elective (RCBC= Natural Science [3-4])		3.0-4.0
PHIL 391	Philosophy of Religion (RCBC= REL 205 [3])	3.0
Elective (RCBC = *take foreign language [3])		4.0
Excess free elective credits from semester to Drexel credits		17.0
	Term Credits	33.0-34.0
Third Year		
Fall		
At Drexel		
Mathematics Course		3.0-4.0
PHIL 215	Contemporary Philosophy	3.0
Foreign Language Course - Completing Level 201		4.0
Studies in Diversity Elective		3.0
COOP 101	Career Management and Professional Development	0.0
	Term Credits	13.0-14.0
Winter		
At Drexel		
PHIL 211	Metaphysics: Philosophy of Reality	3.0
PHIL 212	Ancient Philosophy	3.0
Foreign Language Course - Completing Level 201		4.0
International Studies Elective		3.0
	Term Credits	13.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fourth Year		
Fall		
At Drexel		
PHIL 214	Modern Philosophy	3.0
Professional Ethics Elective		3.0
Philosophy Concentration Course		3.0
Free Elective		3.0
Free Elective		3.0
	Term Credits	15.0
Winter		
At Drexel		
PHIL 221	Epistemology: Philosophy of Knowledge	3.0
Philosophy Concentration Course		3.0
International Studies Elective		3.0
Free Elective		3.0
	Term Credits	12.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
PHIL 421 [WI]	Seminar in Ancient Philosophy	3.0
Thesis or Non-Thesis Course		3.0
Philosophy Concentration Course		3.0
Philosophy Concentration Course		3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
	Term Credits	13.0
Winter		
At Drexel		
PHIL 431 [WI]	Seminar in Modern Philosophy	3.0
Thesis or Non-Thesis Course		3.0
Philosophy Concentration Course		3.0
Philosophy Concentration Course		3.0
	Term Credits	12.0
Spring		
At Drexel		
PHIL 461 [WI]	Seminar in Contemporary Philosophy	3.0
Thesis or Non-Thesis Course		3.0
Philosophy Concentration Course		3.0
Free Elective		3.0
Free Elective		3.0
Free Elective		3.0
	Term Credits	18.0

Total Credit: 182.0-187.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BA in Political Science

Drexel Degree Name: B.A. Political Science

Community College Degree Name: A.A in Political Science

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

63 Credits at RCBC transfers over as 88-90 Credits at Drexel

First Year

Fall		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC=ENG 101 [3]) English Composition I	3.0
MATH 107	Probability and Statistics for Liberal Arts (RCBC=MTH 107 [3])	3.0
Social Science Elective (RCBC=Social Science [3])		3.0
HIST 201 or Foreign Language 1 (RCBC=HIS 101 or Foreign Language 1 [3])		4.0
PSCI 110	American Government (RCBC=POL 101 [3])	4.0
	Term Credits	17.0

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC=ENG 102 [3])	6.0
Humanities/Fine Arts Elective (RCBC=Arts & Humanities Elective [3])		3.0
CS 161	Introduction to Computing (RCBC=CIS 101 or CIS 161 [3])	3.0
HIST 201	United States History to 1815 (RCBC=POL 103 [3])	4.0
Social Science Elective (RCBC=Social Science [3])		3.0
	Term Credits	19.0

Second Year

Fall		
At Community College		
COM 230	Techniques of Speaking (RCBC=SPE 102 [3])	3.0
Science Elective (RCBC=Natural Science [3-4])		3.0-4.0
PSCI 220, 120, or 150	Constitutional Law I (RCBC=POL Elective; POL 215, 220 or 250 [3]) History of Political Thought International Politics	4.0
Diversity Elective (RCBC=Diversity Course [3])		3.0
Math (RCBC=Technology - Replace with Math 2 [3])		3.0
Free Elective (RCBC=Elective [3])		3.0
	Term Credits	19.0-20.0

Spring		
At Community College		
Humanities/Fine Arts Elective (RCBC=Arts & Humanities [3])		3.0
Science Elective (RCBC=Natural Science [3-4])		3.0-4.0
PSCI 220, 120, or 150	Constitutional Law I (RCBC=POL Elective; POL 215, 220 or 250 [3]) History of Political Thought International Politics	4.0
Free Elective (RCBC=Elective [3])		3.0
HIST 202, HIST 203, or Foreign Language 2 (RCBC=HIST 102 or Foreign Language 2 [3])		4.0
Excess Free Elective Credit (from semester to quarter conversion)		16.0
	Term Credits	33.0-34.0

Third Year

Fall		
At Drexel		
PSCI 150	International Politics	4.0
PSCI 260 [WI]	Power in Protest: Social Movements in Comparative Perspective	4.0
Foreign Language 3		4.0
CIVC 101	Introduction to Civic Engagement	1.0
Social Science Elective		3.0
	Term Credits	16.0

Winter		
At Drexel		
PSCI Elective		4.0
PSCI 140	Comparative Politics I	4.0
Foreign Language 4		4.0
Social Science Elective		3.0
	Term Credits	15.0

Spring		
At Drexel		
PSCI 131 [WI]	Research Design for Political Science	4.0
PSCI Elective		4.0
PSCI Elective		4.0
PSCI Elective		4.0
	Term Credits	16.0

Fourth Year

Fall		
At Drexel		
International Studies Elective 1		3.0
PSCI 231	Qualitative and Mixed-Methods Research in Political Science	4.0
PSCI Elective		4.0
PSCI Elective		4.0
	Term Credits	15.0

Winter		
At Drexel		
International Studies Elective 2		3.0
PSCI 232	Quantitative Research Methods in Political Science	4.0
PSCI Elective		4.0
PSCI Elective		4.0
UNIV H201	Looking Forward: Academics and Careers	1.0
	Term Credits	16.0

Spring		
At Drexel		
PSCI Elective		4.0
Free Elective		3.0
Free Elective		3.0
PSCI Elective		4.0
Diversity Studies Elective 2		3.0
	Term Credits	17.0

Total Credit: 183.0-185.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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program/). (http://drexel.edu/coas/academics/departments-centers/
english-philosophy/university-writing-program/drexel-writing-center/)
Students scheduling their courses can also conduct a search for courses
with the attribute "WI" to bring up a list of all writing-intensive courses
available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent
to courses offered in the desired curriculum at Drexel and students must
have completed the courses with a grade of C (C=2.0) or better. The
transfer courses listed should be used as a general guide and might not
be acceptable for every major at the University. Drexel University makes
every effort to keep this guide current, but cannot guarantee that every
course will be acceptable for transfer. The number of credits a student can
transfer will be determined by the academic department once the student
has been accepted into the program.

BA in Sociology

Drexel Degree Name: B.A. Sociology

Community College Degree Name: A.A in Sociology

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

63 Credits at RCBC transfer over as 88-90 Credits at Drexel

Please contact the Department of Sociology **(**https://drexel.edu/coas/academics/departments-centers/sociology/**) for the most current Plan of Study.**

First Year

Fall		**Credits**
At Community College	
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC=ENG 101 [3]) English Composition I	3.0
MATH 107	Probability and Statistics for Liberal Arts (RCBC=MTH 107 [3])	3.0
ANTH 101	Introduction to Cultural Diversity (RCBC=ANTH 102 [3])	3.0
HIST 203	United States History since 1900 (RCBC=HIS 102 [3])	4.0
SOC 101	Introduction to Sociology (RCBC=SOC 101 [3])	3.0
	Term Credits	16.0

Spring | |
--- | --- | ---
At Community College | |
ENGL 102 & ENGL 103 | Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC=ENG 102 [3]) | 6.0
Humanities/Arts Elective (RCBC=Arts & Humanities [3]) | | 3.0
CS 161 | Introduction to Computing (RCBC=CIS 101 or CIS 161 [3]) | 3.0
SOC Elective (RCBC=SOC Course [3]) | | 4.0
PSY 101 | General Psychology I (RCBC=PSY 101 [3]) | 3.0
 | Term Credits | 19.0

Second Year

Fall | |
--- | --- | ---
At Community College | |
COM 230 | Techniques of Speaking (RCBC=SPE 102 [3]) | 3.0

Science Elective (RCBC=Natural Science [3-4])	3.0-4.0
SOC Elective (RCBC=SOC Course [3])	4.0
Diversity Elective (RCBC=Diversity Course [3])	3.0
Free Elective (RCBC=Technology [3])	3.0
Free Elective (RCBC=Elective [3])	3.0
Term Credits	19.0-20.0

Spring |
--- | ---
At Community College |
Humanities/Arts Elective (RCBC=Humanities/Arts Elective [3]) | 3.0
Science Elective (RCBC=Natural Science [3-4]) | 3.0-4.0
SOC Elective (RCBC=SOC Course [3]) | 4.0
Free Elective (RCBC=Elective [3]) | 3.0
HIST 259   History of Europe in the 20th Century (RCBC=HIS 104 [3]) | 4.0
Excess Free Elective Credit (from semester to quarter conversion) | 17.0
Term Credits | 34.0-35.0

Third Year

Fall |
--- | ---
At Drexel |
Math | 3.0
Modern Language 1 | 4.0
SOC 355 [WI]   Classical Social Theory | 4.0
Qualitative Research Methods | 4.0
Term Credits | 15.0

Winter |
--- | ---
At Drexel |
Modern Language 2 | 4.0
SOC Elective | 4.0
SOC Elective | 4.0
Quantitative Research Methods | 4.0
Term Credits | 16.0

Spring |
--- | ---
At Drexel |
CO-OP |
Term Credits | 0.0

Summer |
--- | ---
At Drexel |
CO-OP |
Term Credits | 0.0

Fourth Year

Fall |
--- | ---
At Drexel |
Modern Language 3 | 4.0
SOC Elective (300+ level) | 4.0
Free Elective | 3.0
UNIV H201   Looking Forward: Academics and Careers | 1.0
CIVC 101   Introduction to Civic Engagement | 1.0
Term Credits | 13.0

Winter |
--- | ---
At Drexel |
Modern Language 4 | 4.0
SOC Elective (300+ level) | 4.0
International Elective | 3.0
SOC Elective | 4.0
Term Credits | 15.0

Spring |
--- | ---
At Drexel |
CO-OP |
Term Credits | 0.0

Summer |
--- | ---
At Drexel |

CO-OP

	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
Free Elective		3.0
Social Science Elective		3.0
SOC 356 [WI]	Contemporary Social Theory	4.0
Free Elective		3.0
	Term Credits	13.0
Winter		
At Drexel		
SOC Elective (300+ level)		4.0
International Elective		3.0
SOC Elective (400+ level)		4.0
Free Elective		3.0
	Term Credits	14.0
Spring		
At Drexel		
SOC 450	Capstone in Sociology	4.0
Social Science Elective		3.0
Free Elective		3.0
	Term Credits	10.0

Total Credit: 184.0-186.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Architectural Engineering, Mechanical Concentration

Drexel Degree Name: B.S in Architectural Engineering, Mechanical Concentration

Community College Degree Name: A.S in Engineering

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

69 Credits at RCBC transfer over as 79 Credits at Drexel

Please contact the Department of Civil, Architectural and Environmental Engineering **(**https://drexel.edu/engineering/academics/departments/civil-architectural-environmental-engineering/**) for the most current Plan of Study.**

First Year		
Fall		**Credits**
At Community College		
MATH 121	Calculus I (RCBC= MTH 118 [4])	4.0
CHEM 101	General Chemistry I (RCBC= CHEM 115 & 116 [4])	3.5
ENGR 111	Introduction to Engineering Design & Data Analysis (RCBC= CSE 135 [3])	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3])	3.0
	Term Credits	13.5
Spring		
At Community College		
MATH 122	Calculus II (RCBC= MTH 119 [4])	4.0
PHYS 101	Fundamentals of Physics I (RCBC= PHYS 210 & 211 [4])	4.0
CHEM 102	General Chemistry II (CHEM 117 & 118 [4])	4.5
ENGR 113	First-Year Engineering Design (RCBC= EGR 104 [4])	3.0
	Term Credits	15.5
Summer		
At Community College		
MATH 200	Multivariate Calculus (RCBC= MTH 200 [4])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3])	6.0
ENGR 100	Beginning Computer Aided Drafting for Design (RCBC = EGR 110 [3])	1.0
	Term Credits	11.0
Second Year		
Fall		
At Community College		
MEM 202	Statics (RCBC= EGR 201 [3])	3.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (RCBC= PHY 212 & 213 [4])	8.0
ENGR 220	Fundamentals of Materials (RCBC= EGR 212 [3])	4.0
Free Elective (RCBC= Diversity Elective [3])		4.5
	Term Credits	19.5
Spring		
At Community College		
MATH 262	Differential Equations (RCBC= MTH 230 [4])	3.0
Free Elective (RCBC= Social Science Group B [3])		4.5

Free Elective (RCBC= Arts/Humanities Elective [3])		4.5
Free Elective (RCBC= History Elective [3])		4.5
	Term Credits	16.5

Summer

At Community College

MATH 261	Linear Algebra (RCBC= MTH 201 [3])	3.0
	Term Credits	3.0

Third Year

Fall

At Drexel

ARCH 141	Architecture and Society I	3.0
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
COOP 101	Career Management and Professional Development	0.0
UNIV E101	The Drexel Experience	1.0
CIVE 240 [WI]	Engineering Economic Analysis	3.0
MEM 230	Mechanics of Materials I	4.0
	Term Credits	14.0

Winter

At Drexel

CIVC 101	Introduction to Civic Engagement	1.0
CAEE 203	System Balances and Design in CAEE	3.0
ARCH 142	Architecture and Society II	3.0
ENGR 210	Introduction to Thermodynamics	3.0
ARCH 191	Studio 1-AE	3.0
	Term Credits	13.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fourth Year

Fall

At Drexel

AE 340	Architectural Illumination and Electrical Systems	3.0
ARCH 192	Studio 2-AE	3.0
CIVE 320	Introduction to Fluid Flow	3.0
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
ARCH 143	Architecture and Society III	3.0
	Term Credits	16.0

Winter

At Drexel

AE 220	Introduction to HVAC	3.5
CIVE 330	Hydraulics	4.0
BIO 141	Essential Biology	4.5
CIVE 250	Construction Materials	4.0
	Term Credits	16.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

AE 390	Architectural Engineering Design I	4.0

MEM 345	Heat Transfer	4.0
CIVE 302	Structural Analysis I	4.0
undefined		3.0
	Term Credits	15.0

Winter

At Drexel

AE 391	Architectural Engineering Design II	4.0
Professional Elective		3.0
CAEE 361	Statistical Analysis of Engineering Systems	3.0
CIVE 303	Structural Design I	3.0
	Term Credits	13.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Sixth Year

Fall

At Drexel

AE 544	Building Envelope Systems	3.0
CAE 491 [WI]	Senior Design Project I	3.0
MEM 413	HVAC Loads	3.0
	Term Credits	9.0

Winter

At Drexel

CAE 492 [WI]	Senior Design Project II	3.0
MEM 414	HVAC Equipment	3.0
Professional Elective		3.0
	Term Credits	9.0

Spring

At Drexel

AE 430	Control Systems for HVAC	3.0
CAE 493 [WI]	Senior Design Project III	3.0
	Term Credits	6.0

Total Credit: 190.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses

with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Architectural Engineering, Structural Concentration

Drexel Degree Name: B.S in Architectural Engineering, Structural Concentration

Community College Degree Name: A.S in Engineering

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

72 Credits at RCBC transfer over as 83-90.5 Credits at Drexel

Please contact the Department of Civil, Architectural and Environmental Engineering **(**https://drexel.edu/engineering/academics/departments/civil-architectural-environmental-engineering/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
MATH 121	Calculus I (RCBC= MTH 118 [4])	4.0
CHEM 101	General Chemistry I (RCBC= CHE 115 & 116 [4])	3.5
ENGR 111	Introduction to Engineering Design & Data Analysis (RCBC= CSE 135 [3])	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3]) English Composition I	3.0
	Term Credits	13.5

Spring

At Community College		
MATH 122 & MATH 123	Calculus II (RCBC= MTH 119 [4])	4.0-8.0
PHYS 101	Fundamentals of Physics I (RCBC= PHY 210 & 211 [4])	4.0
CHEM 102	General Chemistry II (CHE 117 & 118 [4])	4.5
ENGR 113	First-Year Engineering Design (RCBC= EGR 104 [4])	3.0
	Term Credits	15.5-19.5

Summer

At Community College		
MATH 200	Multivariate Calculus (RCBC= MTH 220 [4])	4.0

ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3])	3.0-6.0
	Term Credits	7.0-10.0

Second Year

Fall

At Community College		
MEM 202	Statics (RCBC= EGR 201 [3])	3.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (RCBC= PHY 212 & 213 [4])	8.0
TGEE 099 (RCBC= Diversity Elective [3])		4.5
TGEE 099 (RCBC= Social Science Group A [3])		4.5
ENGR 220	Fundamentals of Materials (RCBC= EGR 212 [3])	4.0
	Term Credits	24.0

Spring

At Community College		
MATH 262	Differential Equations (RCBC= MTH 230 [4])	3.0
MEM 238	Dynamics (RCBC= EGR 202 [3])	4.0
TGEE 099 (RCBC= Social Science Group B [3])		4.5
TGEE 099 (RCBC= Arts/Humanities Elective [3])		4.5
TGEE 099 (RCBC= History Elective [3])		4.5
	Term Credits	20.5

Summer

At Community College		
MATH 261 or ENGR 231	Linear Algebra (RCBC= MTH 201 [3]) Linear Engineering Systems	3.0
	Term Credits	3.0

Third Year

Fall

At Drexel		
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
ARCH 141	Architecture and Society I	3.0
MEM 230	Mechanics of Materials I	4.0
COOP 101	Career Management and Professional Development	0.0
CIVE 240 [WI]	Engineering Economic Analysis	3.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	14.0

Winter

At Drexel		
CAEE 203	System Balances and Design in CAEE	3.0
ARCH 191	Studio 1-AE	3.0
ARCH 142	Architecture and Society II	3.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 210	Introduction to Thermodynamics	3.0
	Term Credits	13.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
AE 340	Architectural Illumination and Electrical Systems	3.0
ARCH 192	Studio 2-AE	3.0
CIVE 320	Introduction to Fluid Flow	3.0
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
	Term Credits	13.0

Winter

	At Drexel	
AE 220	Introduction to HVAC	3.5
CIVE 330	Hydraulics	4.0
CIVE 250	Construction Materials	4.0
CAEE 361	Statistical Analysis of Engineering Systems	3.0
	Term Credits	14.5
Spring		
	At Drexel	
CO-OP		
	Term Credits	0.0
Summer		
	At Drexel	
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
	At Drexel	
AE 390	Architectural Engineering Design I	4.0
CIVE 302	Structural Analysis I	4.0
CIVE 312	Soil Mechanics I	4.0
Professional Elective		3.0
	Term Credits	15.0
Winter		
	At Drexel	
Professional Elective		3.0
AE 391	Architectural Engineering Design II	4.0
CIVE 303	Structural Design I	3.0
CIVE 315	Soil Mechanics II	4.0
	Term Credits	14.0
Spring		
	At Drexel	
CO-OP		
	Term Credits	0.0
Summer		
	At Drexel	
CO-OP		
	Term Credits	0.0
Sixth Year		
Fall		
	At Drexel	
CAE 491 [WI]	Senior Design Project I	3.0
AE 544	Building Envelope Systems	3.0
CIVE 400	First Principles of Structural Design	3.0
ARCH 143	Architecture and Society III	3.0
	Term Credits	12.0
Winter		
	At Drexel	
CAE 492 [WI]	Senior Design Project II	3.0
CIVE 401	Structural Design II	3.0
	Term Credits	6.0
Spring		
	At Drexel	
CAE 493 [WI]	Senior Design Project III	3.0
CIVE 402	Structural Design III	3.0
	Term Credits	6.0

Total Credit: 191.0-198.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Biological Science

Drexel Degree Name: B.S. in Biological Science

Community College Degree Name: A.S in Biology

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

67 Credits at RCBC transfers over as 90 Credits at Drexel

Please contact the Department of Biology (https://drexel.edu/coas/academics/departments-centers/biology/) for the most current Plan of Study.

First Year		
Fall		**Credits**
	At Community College	
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3]) English Composition I	3.0
MATH 121	Calculus I (RCBC = *Take MTH 118 [4])	4.0
BIO 122	Cells and Genetics (RCBC= BIO 103 and BIO 104 [4])	4.5
CHEM 101	General Chemistry I (RCBC= CHE 115 and CHE 116 [4])	3.5
	Term Credits	15.0
Spring		

At Community College

ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3])	6.0
BIO 124 & BIO 126	Evolution & Organismal Diversity (RCBC= BIO 107 and BIO 108 [4])	9.0
CHEM 102 & CHEM 103	General Chemistry II (RCBC= CHE 117 and CHE 118 [4])	9.5
MATH 122 & MATH 123	Calculus II (RCBC = *Take MTH 119 [4]for Elective)	8.0
	Term Credits	32.5

Summer

At Community College

Free Elective (RCBC= Diversity Elective [3])		3.0
Social Sciences Elective (RCBC = Arts and Humanities [3])		3.0
	Term Credits	6.0

Second Year

Fall

At Community College

PHYS 152	Introductory Physics I (RCBC = Program Course *take PHY 210 [3] & PHY 211 [1])	4.0
CHEM 241	Organic Chemistry I (RCBC = Program Course * take CHE 240 [3] & CHE 241 [1])	4.0
Social Science Elective (RCBC= Social Science [3])		3.0
Humanities and Social Sciences Elective (RCBC= History Elective [3])		3.0
	Term Credits	14.0

Spring

At Community College

PHYS 153 & PHYS 154	Introductory Physics II (RCBC Program Course = * PHY 212 [3] & PHY 213 [1])	8.0
CHEM 242 & CHEM 243	Organic Chemistry II (RCBC Program course = *take CHE 240 [3] * CHE 241 [1])	7.0
COM 230	Techniques of Speaking (RCBC Elective = *SPE 102 [3])	3.0
Free Elective (RCBC Social Science Elective [3])		1.5
	Term Credits	19.5

Summer

At Community College

COM 310 [WI] or 320 [WI]	Technical Communication (RCBC Elective = *take ENGL 105 [3]) Science Writing	3.0
	Term Credits	3.0

Third Year

Fall

At Drexel

BIO 209	Cell, Molecular & Developmental Biology I	4.0
ENVS 212	Evolution	4.0
BIO 207	Applications in Biology I	1.0
COOP 101	Career Management and Professional Development	0.0
Science, Tech, Hlth and Human Affairs Elective		3.0
Free Elective		3.0
	Term Credits	15.0

Winter

At Drexel

BIO 211	Cell, Molecular & Developmental Biology II	4.0
PHIL 251	Ethics	3.0
BIO 208	Applications in Biology II	1.0
UNIV S201	Looking Forward: Academics and Careers	1.0
CIVC 101	Introduction to Civic Engagement	1.0
Free Elective		3.0
	Term Credits	13.0

Spring

At Drexel

CO-OP		
	Term Credits	0.0

Summer

At Drexel

CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel

BIO/ENVS Elective		3.0
BIO Conc Requirement		3.0
MATH 410	Scientific Data Analysis I	3.0
BIO 311	Biochemistry	4.0
BIO 219 [WI]	Techniques in Molecular Biology	3.0
	Term Credits	16.0

Winter

At Drexel

BIO/ENVS Elective		3.0
BIO Conc Requirement		3.0
MATH 411	Scientific Data Analysis II	3.0
BIO 224	Form, Function & Evolution of Vertebrates	4.0
BIO 225	Vertebrate Biology and Evolution Laboratory	2.0
	Term Credits	15.0

Spring

At Drexel

CO-OP		
	Term Credits	0.0

Summer

At Drexel

CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel

BIO/ENVS Requirement		3.0
BIO Conc Requirement		3.0
BIO 471	Seminar in Biological Sciences	2.0
Lab Requirement		2.0
Free Electives		7.5
	Term Credits	17.5

Winter

At Drexel

BIO/ENVS Elective		3.0
BIO Conc Requirement		3.0
BIO 472	Seminar in Biological Sciences	2.0
Free Elective		3.0
Lab Requirement		2.0
Free Elective		3.0
	Term Credits	16.0

Total Credit: 182.5

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of

writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Business Administration - Major in Accounting

Drexel Degree Name: B.S in Business Administration; Major in Accounting

Community College Degree Name: A.S in Business Administration

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

60 Credits at RCBC Transfer as 80-83 Credits at Drexel

Please contact the Department of Accounting **(**https://www.lebow.drexel.edu/faculty-and-research/disciplines/accounting/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3]) English Composition I	3.0
MATH 101	Introduction to Analysis I (RCBC= MTH 141 [3]))	4.0
BIO, CHEM or PHYS (RCBC= Natural Science [3-4])		3.0
Free Elective (RCBC= ACC 112 [4])		4.5
	Term Credits	14.5

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3])	3.0-6.0
General Education Elective (RCBC= Diversity Elective [3])		3.0
BIO, CHEM or PHYS (RCBC= Natural Science [3-4])		3.0
ACCT 115	Financial Accounting Foundations (RCBC= ACC 113 [4])	4.0

MATH 102	Introduction to Analysis II (RCBC= MTH 142 [3])	4.0
	Term Credits	17.0-20.0

Summer		
At Community College		
Social Science Elective (RCBC= Social Science [3])		3.0
History Elective (RCBC= History [3])		4.0
	Term Credits	7.0

Second Year

Fall		
At Community College		
BUSN 111	Foundations for Business (RCBC= BUA 101 [3])	4.0
ECON 201	Principles of Microeconomics (RCBC= ECO 203 [3])	4.0
STAT 201	Introduction to Business Statistics (RCBC= MTH 143 [4])	4.0
General Education Elective (RCBC= Social Science [3])		3.0
	Term Credits	15.0

Spring		
At Community College		
BLAW 201	Business Law I (RCBC= BUA 205 [3])	4.0
MKTG 201	Introduction to Marketing Management (RCBC= BUA 220 [3])	4.0
ECON 202	Principles of Macroeconomics (RCBC= ECO 204 [3])	4.0
General Education Elective (RCBC= Arts and Humanities [3])		3.0
Excess Free Elective Credit		11.5
	Term Credits	26.5

Summer		
At Community College		
STAT 202	Business Statistics II (RCBC= MTH 243 [3])	4.0
COM 270 [WI]	Business Communication (RCBC= ENG 106 [3])	3.0
	Term Credits	7.0

Third Year

Fall		
At Drexel		
ACCT 321	Financial Reporting I	4.0
MIS 200	Management Information Systems	4.0
PSY 101	General Psychology I	3.0
ACCT 116	Managerial Accounting Foundations	4.0
UNIV B101	The Drexel Experience	1.0
COOP 101	Career Management and Professional Development	0.0
	Term Credits	16.0

Winter		
At Drexel		
ACCT 322	Financial Reporting II	4.0
FIN 301	Introduction to Finance	4.0
Fine Arts Elective		3.0
Society and Culture Elective		3.0
CIVC 101	Introduction to Civic Engagement	1.0
	Term Credits	15.0

Spring		
At Drexel		
CO-OP		
	Term Credits	0.0

Summer		
At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall		
At Drexel		
ACCT 323	Financial Reporting III	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
INTB 200	International Business	4.0

PHIL 105	Critical Reasoning	3.0
	Term Credits	15.0
Winter		
At Drexel		
ACCT 341	Principles of Auditing	4.0
TAX 341	Individual Income Taxes	4.0
OPM 200	Operations Management	4.0
Science Elective		3.0
	Term Credits	15.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
ACCT 331	Cost Accounting	4.0
TAX 342	Business Income Taxes	4.0
General Education Elective		3.0
English Elective		3.0
UNIV B201 [WI]	Career Management	1.0
	Term Credits	15.0
Winter		
At Drexel		
ACCT 329	Advanced Accounting	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
Business Elective		4.0
Free Elective		2.0
	Term Credits	14.0

Total Credit: 177.0-180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Agreements
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Business Administration - Major in Marketing

Drexel Degree Name: B.S in Business Administration; Major in Marketing

Community College Degree Name: A.S in Business Administration

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

66 Credits at RCBC Transfers as 87-90 Credits at Drexel

Please contact the Department of Marketing **(**https://www.lebow.drexel.edu/faculty-and-research/disciplines/marketing/**) for the most current Plan of Study.**

First Year		
Fall		**Credits**
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3]) English Composition I	3.0
MATH 101	Introduction to Analysis I (RCBC= MTH 141 [3])	4.0
BIO, CHEM or PHYS (RCBC= Natural Science [3-4])		3.0
Free Elective (RCBC= ACC 112 [4])		4.5
	Term Credits	14.5
Spring		
At Community College		
ACCT 115	Financial Accounting Foundations (RCBC= ACC 113 [4])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3])	6.0
MATH 102	Introduction to Analysis II (RCBC= MTH 142 [3])	4.0
General Education Elective (RCBC= Diversity Elective [3])		3.0
BIO, CHEM or PHYS (RCBC= Natural Science [3-4])		3.0
	Term Credits	20.0
Summer		
At Community College		
Social Science Elective (RCBC= Social Science [3])		3.0
History Elective (RCBC= History Elective [3])		4.0
	Term Credits	7.0
Second Year		
Fall		
At Community College		
BUSN 111	Foundations for Business (RCBC= BUA 101 [3])	4.0

ECON 201	Principles of Microeconomics (RCBC= ECO 203 [3])	4.0
STAT 201	Introduction to Business Statistics (RCBC= MTH 143 [4])	4.0
General Education Elective (RCBC= Social Science [3])		3.0
	Term Credits	15.0

Spring

At Community College

BLAW 201	Business Law I (RCBC= BUA 205 [3])	4.0
ECON 202	Principles of Macroeconomics (RCBC= ECO 204 [3])	4.0
MKTG 201	Introduction to Marketing Management (RCBC= BUA 220 [3])	4.0
General Education Elective (RCBC= Arts & Humanities Elective [3])		3.0
Excess Free Elective Credit		11.5
	Term Credits	26.5

Summer

At Community College

STAT 202	Business Statistics II (RCBC= MTH 243 [3])	4.0
COM 270 [WI]	Business Communication (RCBC= ENG 106 [3])	3.0
	Term Credits	7.0

Third Year

Fall

At Drexel

ACCT 116	Managerial Accounting Foundations	4.0
COOP 101	Career Management and Professional Development	0.0
MIS 200	Management Information Systems	4.0
MKTG 326	Marketing Insights	4.0
PSY 101	General Psychology I	3.0
UNIV B101	The Drexel Experience	1.0
	Term Credits	16.0

Winter

At Drexel

CIVC 101	Introduction to Civic Engagement	1.0
FIN 301	Introduction to Finance	4.0
MKTG 356	Consumer Behavior	4.0
Fine Arts Elective		3.0
Society & Culture Elective		3.0
	Term Credits	15.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fourth Year

Fall

At Drexel

INTB 200	International Business	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
PHIL 105	Critical Reasoning	3.0
MKTG Elective		4.0
	Term Credits	15.0

Winter

At Drexel

OPM 200	Operations Management	4.0
MKTG Elective		4.0
MKTG Elective		4.0
Science Elective		3.0
	Term Credits	15.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

UNIV B201 [WI]	Career Management	1.0
MKTG Elective		4.0
MKTG Elective		4.0
General Education Elective		3.0
English Elective		3.0
	Term Credits	15.0

Winter

At Drexel

MKTG 380	Seminar in Marketing Strategy	4.0
MGMT 450	Strategy and Competitive Advantage	4.0
Business Elective		4.0
Free Elective		2.0
	Term Credits	14.0

Total Credit: 180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Chemical Engineering

Drexel Degree Name: BSCHE - Chemical Engineering

Community College Degree Name: A.S in Engineering

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

63 Credits at RCBC transfers over as 83.5 Credits at Drexel

Please contact the Department of Chemical and Biological Engineering **(**https://drexel.edu/engineering/academics/departments/chemical-biological-engineering/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
CHEM 101	General Chemistry I (RCBC= CHEM 115 & 116 [4])	3.5
CS 190	Selected Computer Language (RCBC= CSE 135 [3])	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3]) English Composition I	3.0
MATH 121	Calculus I (RCBC= MTH 118 [4])	4.0
	Term Credits	13.5

Spring

At Community College		
CHEM 102 & CHEM 103	General Chemistry II (RCBC= CHE 117 & 118 [4])	9.5
ENGR 113 & ENGR 111	First-Year Engineering Design (RCBC= EGR 104 [4])	6.0
MATH 122	Calculus II (RCBC= MTH 119 [4])	4.0
PHYS 101	Fundamentals of Physics I (RCBC= PHYS 210 & 211 [4])	4.0
	Term Credits	23.5

Summer

At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3])	6.0
MATH 200	Multivariate Calculus (RCBC= MTH 220 [4])	4.0
TGEE 099 (RCBC= History Elective [3])		4.5
	Term Credits	14.5

Second Year

Fall

At Community College		
MEM 202	Statics (RCBC= EGR 201 [3])	3.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (RCBC= PHYS 212 & 213 [4])	8.0
TGEE 099 (RCBC= Diversity Elective [3])		4.5
TGEE 099 (RCBC= Social Science Group A [3])		4.5
	Term Credits	20.0

Spring

At Community College		
MATH 210	Differential Equations (RCBC= MTH 230 [4])	4.0
	Term Credits	4.0

Summer

At Community College

CHEM 241	Organic Chemistry I (RCBC= CHEM 230 [3])	4.0
MATH 201	Linear Algebra (RCBC= MTH 201 [3])	4.0
	Term Credits	8.0

Third Year

Fall

At Drexel		
CHE 211	Material and Energy Balances I	4.0
CHE 220	Computational Methods in Chemical Engineering I	3.0
COOP 101	Career Management and Professional Development	0.0
ENGR 220	Fundamentals of Materials	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	12.0

Winter

At Drexel		
CHE 212	Material and Energy Balances II	4.0
CHE 230	Chemical Engineering Thermodynamics I	4.0
CHEM 242	Organic Chemistry II	4.0
CIVC 101	Introduction to Civic Engagement	1.0
	Term Credits	13.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
CHE 330	Chemical Engineering Thermodynamics II	4.0
CHE 341	Fluid Mechanics	4.0
CHE 350	Statistics and Design of Experiments	3.0
CHEM 356	Physical Chemistry Laboratory	2.0
	Term Credits	13.0

Winter

At Drexel		
CHE 320	Computational Methods in Chemical Engineering II	3.0
CHE 342	Heat Transfer	4.0
CHE 343	Mass Transfer	4.0
CHE 351	Chemical Engineering Laboratory I	2.5
	Term Credits	13.5

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel		
CHE 331	Separation Processes	3.0
CHE 362	Chemical Kinetics and Reactor Design	4.0
CHE 453	Chemical Engineering Laboratory III	2.5
CHE 464	Process Dynamics and Control	3.0
CHE 471	Process Design I	4.0
	Term Credits	16.5

Winter

At Drexel

CHE 352	Chemical Engineering Laboratory II	2.5
CHE 371	Engineering Economics and Professional Practice	3.0
CHE 372	Integrated Case Studies in Chemical Engineering	3.0
CHE 472	Process Design II	3.0
Tech Elective		3.0
	Term Credits	14.5
Spring		
At Drexel		
CHE 466	Chemical Process Safety	3.0
CHE 473	Process Design III	3.0
CHEC 353	Physical Chemistry and Applications III	4.0
BIO Elective		3.0
Tech Elective		3.0
	Term Credits	16.0

Total Credit: 182.0

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Chemistry

Drexel Degree Name: B.S. Chemistry

Community College Degree Name: A.S in Chemistry

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

63 Credits at RCBC transfers over as 89 Credits at Drexel

Please contact the Department of Chemistry (https://drexel.edu/coas/academics/departments-centers/chemistry/) for the most current Plan of Study.

First Year

Fall		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3]) English Composition I	3.0
MATH 121	Calculus I (RCBC= MTH 118 [4])	4.0
PHYS 101	Fundamentals of Physics I (RCBC=PHY 210 and PHY 211 [4])	4.0
CHEM 121	Majors Chemistry I (RCBC= CHE 115 and CHE 116 [4])	5.0
	Term Credits	16.0
Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3])	6.0

Liberal Studies Elective (RCBC = Arts & Humanities Elective [3])		3.0
CS 164 or 161	Introduction to Computer Science (RCBC= CIS 101 or CIS 161 [3]) Introduction to Computing	3.0
CHEM 122 & CHEM 123	Majors Chemistry II (RCBC= CHE 117 and CHE 118 [4])	10.5
BIO 212	Biotechnology (RCBC= BIT 103 [3])	3.0
	Term Credits	25.5
Second Year		
Fall		
At Community College		
COM 230	Techniques of Speaking (RCBC= SPE 102 [3])	3.0
BIO 122	Cells and Genetics (RCBC= *take BIO 103 and 104 [4])	4.5
CHEM 246	Organic Chemistry for Majors I (RCBC= CHE 240 and CHE 241 [4])	6.5
Humanities Elective (RCBC= Diversity Course [3])		3.0
	Term Credits	17.0
Spring		
At Community College		
Humanities Elective (RCBC= Arts & Humanities [3])		3.0
CHEM 248 & CHEM 249	Organic Chemistry for Majors II (RCBC= CHE 242 and CHE 243 [4])	13.5
MATH 122	Calculus II (RCBC = MTH 119 [4])	4.0
Free Elective (RCBC= History [3])		3.0
MATH 200	Multivariate Calculus (RCBC= MTH 220 [4])	4.0
	Term Credits	27.5
Third Year		
Fall		
At Drexel		
CHEM 230	Quantitative Analysis	4.0
CHEM 231 [WI]	Quantitative Analysis Laboratory	2.0
CHEM 253	Thermodynamics and Kinetics	4.0
BIO 214	Principles of Cell Biology	4.0
COOP 101	Career Management and Professional Development	0.0
	Term Credits	14.0
Winter		
At Drexel		
CHEM 270	Software Skills for Chemists	3.0
CHEM 357 [WI]	Physical Chemistry Laboratory I	2.5
MATH 201 or 210	Linear Algebra Differential Equations	4.0
Free Elective		4.0
	Term Credits	13.5
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
COOP		
	Term Credits	0.0
Fourth Year		
Fall		
At Drexel		
CHEM 355	Physical Chemistry IV	3.0
CHEM 367	Chemical Information Retrieval	3.0
CHEM 421	Inorganic Chemistry I	3.0
CHEM 430	Analytical Chemistry I	3.0
UNIV S201	Looking Forward: Academics and Careers	1.0
Free Elective		4.0
	Term Credits	17.0
Winter		
At Drexel		
CHEM 359	Atomic and Molecular Spectroscopy	3.0

CHEM 420	Molecular Symmetry and Group Theory Applied Chemistry	3.0
CHEM 431 [WI]	Analytical Chemistry II	4.0
Technical Elective		3.0
Free Elective		4.0
	Term Credits	17.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
CHEM 346	Qualitative Organic Chemistry	5.5
CHEM 358	Physical Chemistry Laboratory II	2.5
CHEM 493	Senior Research Project	3.0
BIO 311	Biochemistry	4.0
or 404	Structure and Function of Biomolecules	
	Term Credits	15.0
Winter		
At Drexel		
CHEM 493	Senior Research Project	3.0
BIO 306	Biochemistry Laboratory	2.0
Technical Elective		3.0
Free Elective		3.0
Free Elective		3.0
	Term Credits	14.0
Spring		
At Drexel		
CHEM 422	Inorganic Chemistry II	3.0
CHEM 425	Inorganic Chemistry Laboratory	4.0
CHEM 493	Senior Research Project	3.0
Free Elective		3.0
	Term Credits	13.0

Total Credit: 189.5

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Civil Engineering

Drexel Degree Name: B.S in Civil Engineering

Community College Degree Name: A.S in Engineering

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

72 Credits at RCBC transfers over as 83.5 Credits at Drexel

Please contact the Department of Civil, Architectural and Environmental Engineering **(**https://drexel.edu/engineering/academics/departments/civil-architectural-environmental-engineering/**) for the most current Plan of Study.**

First Year		
Fall		**Credits**
At Community College		
MATH 121	Calculus I (RCBC= MTH 118 [4])	4.0
CHEM 101	General Chemistry I (RCBC= CHEM 115 & 116 [4])	3.5
ENGR 111	Introduction to Engineering Design & Data Analysis (RCBC= CSE 135 [3])	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3]) English Composition I	3.0
	Term Credits	13.5
Spring		
At Community College		
MATH 122 & MATH 123	Calculus II (RCBC= MTH 119 [4])	4.0
PHYS 101	Fundamentals of Physics I (RCBC= PHY 210 & 211 [4])	4.0
CHEM 102	General Chemistry II (RCBC= CHE 117 & 118 [4])	4.5
ENGR 113	First-Year Engineering Design (RCBC= EGR 104 [4])	3.0
	Term Credits	15.5
Summer		
At Community College		
MATH 200	Multivariate Calculus (RCBC= MTH 220 [4])	4.0
ENGL 102 or 112	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3]) English Composition II	3.0
	Term Credits	7.0

Second Year

Fall

At Community College

MEM 202	Statics (RCBC= EGR 201 [3])	3.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (RCBC= PHYS 212 & 213 [4])	8.0
TGEE 099 (RCBC= Diversity Elective [3])		4.5
TGEE 099 (RCBC= Social Science Group A [3])		4.5
ENGR 220	Fundamentals of Materials (RCBC= EGR 212 [3])	4.0
	Term Credits	24.0

Spring

At Community College

MATH 262 or ENGR 232	Differential Equations (RCBC= MTH 230 [4]) Dynamic Engineering Systems	3.0
TGEE 099 (RCBC= Social Science Group B [3])		4.5
TGEE 099 (RCBC= Arts/Humanities [3])		4.5
TGEE 099 (RCBC= History Elective [3])		4.5
MEM 238	Dynamics (RCBC= EGR 202 [3])	4.0
	Term Credits	20.5

Summer

At Community College

| MATH 261 or ENGR 231 | Linear Algebra (RCBC= MTH 201 [3]) Linear Engineering Systems | 3.0 |
| | Term Credits | 3.0 |

Third Year

Fall

At Drexel

CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
MEM 230	Mechanics of Materials I	4.0
COOP 101	Career Management and Professional Development	0.0
UNIV E101	The Drexel Experience	1.0
CIVE 240 [WI]	Engineering Economic Analysis	3.0
CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
	Term Credits	15.0

Winter

At Drexel

CAEE 203	System Balances and Design in CAEE	3.0
ENGR 210	Introduction to Thermodynamics	3.0
CIVE 250	Construction Materials	4.0
CIVC 101	Introduction to Civic Engagement	1.0
BIO 141	Essential Biology	4.5
	Term Credits	15.5

Spring

At Drexel

CO-OP

| | Term Credits | 0.0 |

Summer

At Drexel

CO-OP

| | Term Credits | 0.0 |

Fourth Year

Fall

At Drexel

ENVE 300	Introduction to Environmental Engineering	3.0
CIVE 320	Introduction to Fluid Flow	3.0
CIVE 302	Structural Analysis I	4.0
CAEE 361	Statistical Analysis of Engineering Systems	3.0
	Term Credits	13.0

Winter

At Drexel

| CIVE 330 | Hydraulics | 4.0 |

CIVE 303	Structural Design I	3.0
CIVE 375	Structural Material Behavior	3.0
Professional Elective		3.0
	Term Credits	13.0

Spring

At Drexel

CO-OP

| | Term Credits | 0.0 |

Summer

At Drexel

CO-OP

| | Term Credits | 0.0 |

Fifth Year

Fall

At Drexel

CAE 491 [WI]	Senior Design Project I	3.0
Professional Elective		3.0
CIVE 312	Soil Mechanics I	4.0
CIVE 477 [WI]	Seminar	2.0
CIVE 430	Hydrology	3.0
	Term Credits	15.0

Winter

At Drexel

CAE 492 [WI]	Senior Design Project II	3.0
Professional Elective		3.0
Professional Elective		3.0
CIVE 478 [WI]	Seminar	1.0
CIVE 315	Soil Mechanics II	4.0
	Term Credits	14.0

Spring

At Drexel

CAE 493 [WI]	Senior Design Project III	3.0
Professional Elective		3.0
Professional Elective		3.0
	Term Credits	9.0

Total Credit: 178.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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Transfer Credits

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BS in Communication - Public Relations Concentration

Drexel Degree Name: B.S. Communication, Public Relations Concentration

Community College Degree Name: A.A in Communication Arts

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

66 Credits at RCBC transfers over as 87-90 Credits at Drexel

Please contact the Department of Communication **(**https://drexel.edu/coas/academics/departments-centers/communication/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC=ENG 101 [3]) English Composition I	3.0
ENGL T280	Special Topics in English (RCBC=ENG 252 [3])	3.0
PSCI 110	American Government (RCBC=POL 101 [3])	4.0
HIST Elective (RCBC=History Elective [3])		4.0
Math Elective (RCBC=Mathematics [3])		3.0-4.0
	Term Credits	17.0-18.0

Spring

At Community College		
COM 246	Media and Identity (RCBC=SOC 207 [3])	3.0
CS 161	Introduction to Computing (RCBC=CIS 101 or CS 161 [3])	3.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC=ENG 102 [3])	6.0
Free Elective (RCBC=Technology [3])		3.0
Arts & Humanities Elective (RCBC=Arts & Humanities [3])		3.0
Social Science Elective (RCBC=Social Science [3])		3.0
	Term Credits	21.0

Second Year

Fall

At Community College		
COM 230	Techniques of Speaking (RCBC=SPE 102 [3])	3.0
Science Elective (RCBC=Natural Science [3-4])		3.0-4.0
COM Elective (RCBC=Program Elective [3])		3.0
Diversity Elective (RCBC=Diversity Course [3])		3.0

History Elective (RCBC=History Elective [3])		4.0
Arts & Humanities Elective (RCBC=Arts & Humanities [3])		3.0
	Term Credits	19.0-20.0

Spring

At Community College		
Arts & Humanities (RCBC=Arts & Humanities [3])		3.0
Science Elective (RCBC=Natural Science [3-4])		3.0-4.0
COM Elective (RCBC=Program Elective [3])		3.0
Free Elective (RCBC=Elective [3])		3.0
Free Elective (RCBC=Elective [3])		3.0
Excess Free Elective Credit (semester to quarter conversion)		15.0
	Term Credits	30.0-31.0

Third Year

Fall

At Drexel		
CIVC 101	Introduction to Civic Engagement	1.0
COM 101	Human Communication	3.0
COM 150	Mass Media and Society	3.0
COM 181	Public Relations Principles and Theory	3.0
COOP 101	Career Management and Professional Development	0.0
MATH 101	Introduction to Analysis I	4.0
	Term Credits	14.0

Winter

At Drexel		
COM 210	Theory and Models of Communication	3.0
MATH 102	Introduction to Analysis II	4.0
PSY 101	General Psychology I	3.0
COM Elective		3.0
	Term Credits	13.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
COM 160	Introduction to Journalism	3.0
COM 220	Qualitative Research Methods	3.0
LING 102 or 101	Language and Society Introduction to Linguistics	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Interpersonal Communication		3.0
	Term Credits	13.0

Winter

At Drexel		
COM 282 [WI]	Public Relations Writing	3.0
COM 284	Public Relations Research, Measurement and Evaluation	3.0
Diversity Elective		3.0
Social Media in Communication		3.0
	Term Credits	12.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		

CO-OP

	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
COM 286	Public Relations Strategies and Tactics	3.0
COM 491	Senior Project in Communication I	3.0
COM Electives		6.0
Social Science Elective		3.0
	Term Credits	15.0
Winter		
At Drexel		
COM 335	Digital Publishing	3.0
or 340	Desktop Publishing	
COM 492	Senior Project in Communication II	3.0
MKTG 201	Introduction to Marketing Management	4.0
International Elective		3.0
	Term Credits	13.0
Spring		
At Drexel		
COM 240	New Technologies In Communication	3.0
COM 386	Public Relations Campaign Planning	3.0
COM 400	Seminar in Communication	3.0
PHIL 305	Ethics and the Media	3.0
International Elective		3.0
	Term Credits	15.0

Total Credit: 182.0-185.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Communication - Technical & Science Communication Concentration

Drexel Degree Name: B.A. Communication, Technical & Science Communication Concentration

Community College Degree Name: A.A in Communication Arts

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

66 Credits at RCBC transfers over as 87-90 Credits at Drexel

Please contact the Department of Communication **(**https://drexel.edu/coas/academics/departments-centers/communication/**) for the most current Plan of Study.**

First Year		
Fall		**Credits**
At Community College		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC=ENG 101 [3])	3.0
or 111	English Composition I	
PSCI 110	American Government (RCBC=POL 101 [3])	4.0
ENGL T280	Special Topics in English (RCBC=ENG 252 [3])	3.0
Math Elective (RCBC=Mathematics [3])		3.0-4.0
HIST Elective (RCBC=History Elective [3])		4.0
	Term Credits	17.0-18.0
Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC=ENG 102 [3])	6.0
CS 161	Introduction to Computing (RCBC=CIS 101 or CIS 161 [3])	3.0
COM 246	Media and Identity (RCBC=SOC 207 [3])	3.0
Arts & Humanities (RCBC=Arts & Humanities [3])		3.0
Social Science Elective (RCBC=Social Science [3])		3.0
Free Elective (RCBC=Technology [3])		3.0
	Term Credits	21.0
Second Year		
Fall		
At Community College		
COM 230	Techniques of Speaking (RCBC=SPE 102 [3])	3.0
Science Elective (RCBC=Natural Science [3-4])		3.0-4.0
COM Elective (RCBC=Program Elective [3])		3.0
Diversity Elective (RCBC=Diversity Course [3])		3.0
History Elective (RCBC=History Elective [3])		4.0
Arts & Humanities Elective (RCBC=Arts & Humanities [3])		3.0
	Term Credits	19.0-20.0
Spring		
At Community College		

Arts & Humanities Elective (RCBC=Arts & Humanities [3])		3.0
Science Elective (RCBC=Natural Science [3-4])		3.0-4.0
COM Elective (RCBC=Program Elective [3])		3.0
Free Elective (RCBC=Elective [3])		3.0
Free Elective (RCBC=Elective [3])		3.0
Excess Free Elective Credit (from semester to quarter conversion)		15.0
	Term Credits	30.0-31.0

Third Year
Fall
At Drexel

COM 101	Human Communication	3.0
MATH 101	Introduction to Analysis I	4.0
COM 310 [WI]	Technical Communication	3.0
COOP 101	Career Management and Professional Development	0.0
COM 150	Mass Media and Society	3.0
CIVC 101	Introduction to Civic Engagement	1.0
	Term Credits	14.0

Winter
At Drexel

COM 210	Theory and Models of Communication	3.0
COM 160	Introduction to Journalism	3.0
COM 240	New Technologies In Communication	3.0
MATH 102	Introduction to Analysis II	4.0
COM Elective		3.0
	Term Credits	16.0

Spring
At Drexel

CO-OP		
	Term Credits	0.0

Summer
At Drexel

CO-OP		
	Term Credits	0.0

Fourth Year
Fall
At Drexel

COM 220	Qualitative Research Methods	3.0
LING 102 or 101	Language and Society Introduction to Linguistics	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
COM 181	Public Relations Principles and Theory	3.0
PSY 101	General Psychology I	3.0
Interpersonal Communication		3.0
	Term Credits	16.0

Winter
At Drexel

COM 221	Quantitative Research Methods in Communication	3.0
PHIL 305	Ethics and the Media	3.0
COM 320 [WI]	Science Writing	3.0
COM 335	Digital Publishing	3.0
COM Elective		3.0
Social Media in Communication		3.0
	Term Credits	18.0

Spring
At Drexel

CO-OP		
	Term Credits	0.0

Summer
At Drexel

CO-OP		
	Term Credits	0.0

Fifth Year
Fall
At Drexel

COM 400	Seminar in Communication	3.0
COM 350 [WI]	Document Design and Evaluation	3.0
COM 491	Senior Project in Communication I	3.0
Social Science Elective		3.0
International Elective		3.0
	Term Credits	15.0

Winter
At Drexel

COM 492	Senior Project in Communication II	3.0
Tech & Society Elective		3.0
Tech & Society Elective		3.0
Tech & Society Elective		3.0
International Elective		3.0
	Term Credits	15.0

Spring
At Drexel

COM 420	Technical, Science and Health Editing	3.0
Multidiciplinary Elective		3.0
Multidisciplinary Elective		3.0
Multidisciplinary Elective		3.0
Diversity Elective		3.0
	Term Credits	15.0

Total Credit: 196.0-199.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can

transfer will be determined by the academic department once the student has been accepted into the program.

BS in Computer Engineering

Drexel Degree Name: B.S in Computer Engineering

Community College Degree Name: A.S in Engineering

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

68 Credits at RCBC transfers over as 86.5 Credits at Drexel

First Year

Fall		Credits
At Community College		
CHEM 101	General Chemistry I (RCBC= CHE 115 & 116 [4])	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3]) English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis (RCBC= CSE 135 [3])	3.0
MATH 121	Calculus I (RCBC= MTH 118 [4])	4.0
	Term Credits	13.5

Spring		
At Community College		
CHEM 102	General Chemistry II (RCBC= CHE 117 & 118 [4])	4.5
ENGR 113	First-Year Engineering Design (RCBC= EGR 104 [4])	3.0
MATH 122 & MATH 123	Calculus II (RCBC= MTH 119 [4])	8.0
PHYS 101	Fundamentals of Physics I (RCBC= PHY 210 & 211 [4])	4.0
	Term Credits	19.5

Summer		
At Community College		
MATH 200	Multivariate Calculus (RCBC= MTH 220 [4])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3])	6.0
Free Elective - (RCBC= EGR 110 [3])		4.5
	Term Credits	14.5

Second Year

Fall		
At Community College		
PHYS 102 & PHYS 201	Fundamentals of Physics II (RCBC= PHY 212 & 213 [4])	8.0
TGFE 099 (RCBC= EGR 201 [3])		4.5
TGEE 099 (RCBC= Diversity Elective [3])		4.5
TGEE 099 (RCBC= Social Science Group A [3])		4.5
	Term Credits	21.5

Spring		
At Community College		
MATH 210*	Differential Equations (RCBC= MTH 230 [4])	4.0
TGEE 099 (RCBC- Social Science Group B [3])		4.5
TGEE 099 (RCBC= Arts/Humanities Elective [3])		4.5
TGEE 099 (RCBC= History Elective [3])		4.5
	Term Credits	17.5

Third Year

Fall

At Drexel

COOP 101	Career Management and Professional Development	0.0
ECE 200	Digital Logic Design	4.0
ECE 201	Foundations of Electric Circuits I	4.0
MATH 201	Linear Algebra	4.0
UNIV E101	The Drexel Experience	1.0
COM Elective		3.0
	Term Credits	16.0

Winter

At Drexel

CIVC 101	Introduction to Civic Engagement	1.0
ENGR 131	Introductory Programming for Engineers	3.0
MATH 221	Discrete Mathematics	3.0
PHIL 315	Engineering Ethics	3.0
Free Elective		3.0
	Term Credits	13.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fourth Year

Fall

At Drexel

ECE 105	Programming for Engineers II	3.0
ECEC 201	Advanced Programming for Engineers	3.0
ECE 301	Foundations of Electric Circuits II	4.0
ECE 361	Probability and Data Analytics for Engineers	4.0
	Term Credits	14.0

Winter

At Drexel

ECES 301	Signals and Systems I	4.0
ECE Electives		9.0
	Term Credits	13.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

ECEC 302	Digital Systems Projects	3.0
ECEC 357	Introduction to Computer Networks	3.0
CS 265	Advanced Programming Tools and Techniques	3.0
ECE 303	ECE Laboratory	3.0
	Term Credits	12.0

Winter

At Drexel

ECEC 355	Computer Organization & Architecture	3.0
CS 260	Data Structures	3.0
ECE 391	Introduction to Engineering Design Methods	1.0
ECE Electives		6.0
	Term Credits	13.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Sixth Year

Fall

At Drexel

ECE 491 [WI]	Senior Design Project I	2.0
ECEC 4XX Elective		3.0
ECE Elective		3.0
	Term Credits	8.0

Winter

At Drexel

ECE 492 [WI]	Senior Design Project II	2.0
ECEC 4XX Elective		3.0
	Term Credits	5.0

Spring

At Drexel

ECE 493	Senior Design Project III	4.0
ECEC 4XX Elective		3.0
	Term Credits	7.0

Total Credit: 187.5

*   MATH 210 sub for ENGR 232

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Electrical Engineering

Drexel Degree Name: B.S in Electrical Engineering

Community College Degree Name: A.S in Engineering

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

72 Credits at RCBC transfers over as 75.5 Credits at Drexel

Please contact the Department of Electrical and Computer Engineering **(**https://drexel.edu/engineering/academics/departments/electrical-computer-engineering/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
CHEM 101	General Chemistry I (RCBC= CHE 115 & 116 [4])	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3]) English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis (RCBC= CSE 135 [3])	3.0
MATH 121	Calculus I (RCBC=MTH 118 [4])	4.0
	Term Credits	13.5

Spring		
At Community College		
CHEM 102	General Chemistry II (RCBC= CHE 117 & 118 [4])	4.5
ENGR 113	First-Year Engineering Design (RCBC= EGR 104 [3])	3.0
MATH 122 & MATH 123	Calculus II (RCBC= MTH 119 [4])	8.0
PHYS 101	Fundamentals of Physics I (RCBC= PHY 210 & 211 [4])	4.0
	Term Credits	19.5

Summer		
At Community College		
MATH 200	Multivariate Calculus (RCBC= MTH 220 [4])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3])	3.0
	Term Credits	7.0

Second Year

Fall		
At Community College		
PHYS 102 & PHYS 201	Fundamentals of Physics II (RCBC= PHY 212 & 213 [4])	8.0
TGFE 099 (RCBC= EGR 201 [3])		4.5
TGEE 099 (RCBC= Diversity Elective [3])		4.5
TGEE 099 (RCBC= Social Science Group A [3])		4.5
	Term Credits	21.5

Spring		
At Community College		
MATH 210	Differential Equations (RCBC= MTH 230 [4])	4.0
TGEE 099 (RCBC= Social Science Group B [3])		4.5
TGEE 099 (RCBC= Arts/Humanities [3])		4.5
	Term Credits	13.0

Summer

At Community College		
MATH 201	Linear Algebra (RCBC= MTH 201 [3])	4.0
or ENGR 231	Linear Engineering Systems	
	Term Credits	4.0
Third Year		
Fall		
At Drexel		
COOP 101	Career Management and Professional Development	0.0
ECE 201	Foundations of Electric Circuits I	4.0
ECE 200	Digital Logic Design	4.0
ENGR 220	Fundamentals of Materials	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	13.0
Winter		
At Drexel		
CIVC 101	Introduction to Civic Engagement	1.0
ECES 301	Signals and Systems I	4.0
ENGR 131	Introductory Programming for Engineers	3.0
Free Elective		3.0
MATH Elective		3.0
	Term Credits	14.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fourth Year		
Fall		
At Drexel		
ECE 105	Programming for Engineers II	3.0
ECE 301	Foundations of Electric Circuits II	4.0
ECE 361	Probability and Data Analytics for Engineers	4.0
ECE Elective		6.0
	Term Credits	17.0
Winter		
At Drexel		
ECE 391	Introduction to Engineering Design Methods	1.0
PHIL 315	Engineering Ethics	3.0
ECE Elective		12.0
COM Elective		3.0
	Term Credits	19.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
ECE 303	ECE Laboratory	3.0
ECE 491 [WI]	Senior Design Project I	2.0
ECES 303	Signals and Systems II	3.0
ECE Elective		6.0
	Term Credits	14.0
Winter		

At Drexel		
ECE 492 [WI]	Senior Design Project II	2.0
ECE Elective		9.0
Free Elective		4.5
	Term Credits	15.5
Spring		
At Drexel		
ECE 493	Senior Design Project III	4.0
ECE Electives		9.0
	Term Credits	13.0

Total Credit: 184.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Environmental Engineering

Drexel Degree Name: B.S in Environmental Engineering

Community College Degree Name: A.S in Engineering

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

73 Credits at RCBC transfer over as 85 Credits at Drexel

Please contact the Department of Civil, Architectural and Environmental Engineering **(**https://drexel.edu/engineering/academics/departments/civil-architectural-environmental-engineering/**) for the most current Plan of Study.**

First Year

Fall

At Community College

		Credits
CHEM 101	General Chemistry I (RCBC= CHE 115 & 116 [4])	3.5
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3]) English Composition I	3.0
ENGR 111	Introduction to Engineering Design & Data Analysis (RCBC= CSE 135 [3])	3.0
MATH 121	Calculus I (RCBC= MTH 118 [4])	4.0
	Term Credits	13.5

Spring

At Community College

CHEM 102	General Chemistry II (RCBC= CHE 117 & 118 [4])	4.5
ENGR 113	First-Year Engineering Design (RCBC= EGR 104 [4])	3.0
MATH 122 & MATH 123	Calculus II (RCBC= MTH 119 [4])	4.0
PHYS 101	Fundamentals of Physics I (RCBC= PHY 210 & 211 [4])	4.0
	Term Credits	15.5

Summer

At Community College

MATH 200	Multivariate Calculus (RCBC= MTH 220 [4])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3])	6.0
	Term Credits	10.0

Second Year

Fall

At Community College

ENGR 220	Fundamentals of Materials (RCBC= EGR 212 [3])	4.0
PHYS 102 & PHYS 201	Fundamentals of Physics II (RCBC= PHYS 212 & 213 [4])	8.0
Transfer Free Elective (RCBC= EGR 201 [3])		3.0
Transfer Free Elective (RCBC= Diversity Elective [3])		4.5
Transfer Free Elective (RCBC= Social Science Group A [3])		4.5
	Term Credits	24.0

Spring

At Community College

MATH 262 or ENGR 232	Differential Equations (RCBC= MTH 230 [4]) Dynamic Engineering Systems	3.0
Transfer Free Elective (RCBC= Social Science Group B [3])		4.5
Transfer Free Elective (RCBC= Arts/Humanities Elective [3])		4.5
Transfer Free Elective (RCBC= History Elective [3])		4.5
	Term Credits	16.5

Summer

At Community College

BIO 141	Essential Biology (RCBC= BIO 103 & 104 [4])	4.5
MATH 201	Linear Algebra (RCBC= MTH 201 [3])	4.0
	Term Credits	8.5

Third Year

Fall

At Drexel

BIO 220	Essential Microbiology	3.0
CAEE 202	Introduction to Civil, Architectural & Environmental Engineering	3.0
CHEM 241	Organic Chemistry I	4.0
CIVE 240 [WI]	Engineering Economic Analysis	3.0
COOP 101	Career Management and Professional Development	0.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	14.0

Winter

At Drexel

CAEE 203	System Balances and Design in CAEE	3.0
CHEM 242	Organic Chemistry II	4.0
CIVC 101	Introduction to Civic Engagement	1.0
ENGR 210	Introduction to Thermodynamics	3.0
ENVS 230	General Ecology	3.0
	Term Credits	14.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fourth Year

Fall

At Drexel

CAEE 212	Geologic Principles for Infrastructure & Environmental Engineering	4.0
CHE 211	Material and Energy Balances I	4.0
CIVE 320	Introduction to Fluid Flow	3.0
ENVE 300	Introduction to Environmental Engineering	3.0
	Term Credits	14.0

Winter

At Drexel

CHEM 230	Quantitative Analysis	4.0
CHEM 231 [WI]	Quantitative Analysis Laboratory	2.0
CIVE 330	Hydraulics	4.0
ENVE 302	Environmental Transport and Kinetics	3.0
PHIL 315	Engineering Ethics	3.0
	Term Credits	16.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

CAEE 361	Statistical Analysis of Engineering Systems	3.0
CIVE 430	Hydrology	3.0
ENVE 460	Fundamentals of Air Pollution Control	3.0
ENVE 485	Professional Environmental Engineering Practice	1.0
ENVE 491 [WI]	Senior Project Design I	3.0
ENVS 401	Chemistry of the Environment	3.0
	Term Credits	16.0
Winter		
At Drexel		
CIVE 431	Hydrology-Ground Water	3.0
ENVE 410	Solid and Hazardous Waste	3.0
ENVE 421	Water and Waste Treatment II	3.0
ENVE 486	Environmental Engineering Processes Laboratory I	2.0
ENVE 492 [WI]	Senior Design Project II	3.0
Technical Elective		3.0
	Term Credits	17.0
Spring		
At Drexel		
ENVE 422	Water and Waste Treatment Design	3.0
ENVE 435	Groundwater Remediation	3.0
ENVE 487	Environmental Engineering Processes Laboratory II	2.0
ENVE 493 [WI]	Senior Design Project III	3.0
Technical Elective		3.0
	Term Credits	14.0

Total Credit: 193.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in General Studies

Drexel Degree Name: B.S. in General Studies

Community College Degree Name: A.S. in Liberal Arts and Sciences

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

60 Credits at RCBC transfer over as 90 Credits at Drexel

Please contact the Goodwin College of Professional Studies **(**https://drexel.edu/goodwin/academics/degree-completion-programs/transfer-credit-apl/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3])	3.0
MATH 100	Fundamentals of Mathematics (RCBC= Mathematics [3])	3.0
Transfer Science Elective (RCBC= Natural Science [3-4])		4.5
Transfer Individual Specialization Elective (RCBC= Program Course [3])		4.5
Transfer Humanities Social Sciences Elective (RCBC= Social Science [3])		4.5
	Term Credits	19.5

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3])	6.0
Transfer Humanities Social Sciences Elective (RCBC= Diversity Course [3])		4.5
Transfer Science Elective (RCBC= Natural Science [3-4])		4.5-6.0
Transfer Individual Specialization Elective (RCBC= Program Course [3])		4.5
Transfer Humanities Social Sciences Elective (RCBC= History Course [3])		4.5
	Term Credits	24.0-25.5

Second Year

Fall		
At Community College		
Transfer Individual Specialization Elective (RCBC= Program Course [3])		4.5
Transfer Individual Specialization Elective (RCBC= Program Course [3])		4.5
Transfer Individual Specialization Elective (RCBC= Program Course [3])		4.5
Transfer Humanities Social Sciences Elective (RCBC= Social Science [3])		4.5
Transfer Free Elective (RCBC= Elective [3])		4.5
	Term Credits	22.5

Spring		
At Community College		
Transfer Individual Specialization Elective (RCBC= Program Course [3])		4.5
Transfer Individual Specialization Elective (RCBC= Program Course [3])		4.5
Transfer Humanities Social Sciences Elective (RCBC= Arts & Humanities [3])		4.5
Transfer Free Elective (RCBC= Elective [3])		4.5
Transfer Free Elective (RCBC= Elective [3])		4.5
	Term Credits	22.5

Third Year

Fall		
At Drexel		
GSTD 200	Lifelong Learning Theory & Practice	3.0
MATH 171	Introduction to Analysis A	3.0
COM 230	Techniques of Speaking	3.0

Free Elective		4.0
Free Elective - Upper Level		3.0
COOP 101	Career Management and Professional Development	0.0
	Term Credits	16.0
Winter		
At Drexel		
GSTD 201 [WI]	Professional Applications of Emotional Intelligence	3.0
Free Elective		4.0
Specialization Elective		3.0
Specialization Elective		3.0
Free Elective - Upper Level		3.0
	Term Credits	16.0
Spring		
At Drexel		
COOP EXPERIENCE		
	Term Credits	0.0
Summer		
At Drexel		
COOP EXPERIENCE		
	Term Credits	0.0
Fourth Year		
Fall		
At Drexel		
GSTD 303	Client Relations Management	3.0
Specialization - Upper Level		3.0
Free Elective - Writing Intensive		3.0
Specialization - Upper Level		3.0
Free Elective		3.0
	Term Credits	15.0
Winter		
At Drexel		
PRST 211	Computer Applications for Professionals	3.0
PRST 303	Interpersonal Skills for Virtual Teams	3.0
Liberal Study - Upper Level		3.0
Free Elective		3.0
Specialization - Upper Level		3.0
	Term Credits	15.0
Spring		
At Drexel		
COOP EXPERIENCE		
	Term Credits	0.0
Summer		
At Drexel		
COOP EXPERIENCE		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
GSTD 491	Senior Project in General Studies	3.0
Liberal Study - Upper Level		3.0
Free Elective - Writing Intensive		3.0
Liberal Study		3.0
Free Elective		3.0
	Term Credits	15.0
Winter		
At Drexel		
Free Elective - Upper Level		3.0
Free Elective		4.0
Liberal Study		3.0
Liberal Study - Upper Level		3.0
	Term Credits	13.0

Total Credit: 178.5-180.0

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

BS in Hospitality Management

Drexel Degree Name: B.S. Hospitality Management

Community College Degree Name: A.S in Hospitality and Tourism

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

65 Credits at RCBC transfer over as 70.5 Credits at Drexel

* Note: This file is still pending updates. Students will need 183 credits to graduate with a B.S Degree

Please contact the Department of Food and Hospitality Management **(**https://drexel.edu/cnhp/academics/departments/food-hospitality-management/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3]) English Composition I	3.0
HRM 110	Introduction to the Hospitality Industry (RCBC= HOS 110 [3])	3.0
MATH 181	Mathematical Analysis I (RCBC= MAT 107 or Higher [3])	3.0
BIO, CHEM or PHYS (RCBC= Natural Science [4])		4.0
	Term Credits	13.0

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3])	6.0
HRM 120	Principles of Food-Service Management (RCBC= HOS 130 [3])	3.0
BIO, CHEM or PHYS (RCBC= Natural Science [4])		3.0
Free Elective RCBC= Diversity Elective [3])		4.5
	Term Credits	16.5

Summer		
At Community College		
Social Science Elective (RCBC= Social Science [3])		3.0
History Elective (RCBC= History Elective [3])		4.0
	Term Credits	7.0

Second Year

Fall		
At Community College		
HRM 220	Purchasing for the Hospitality Industry (RCBC= HOS 150 [3])	3.0
HRM 310	Hospitality Accounting Systems (RCBC= HOS 160 [3])	3.0
HRM 155	Hotel Customer Service (RCBC= HOS 225 [3])	3.0
HRM 130	Introduction to Tourism (RCBC= HOS 230 [3])	3.0
	Term Credits	12.0

Spring		
At Community College		
HRM 131	Tourism Geography (RCBC= HOS 235 [3])	3.0
HRM 150	Food & Beverage Customer Service (RCBC= HOS 252 [3])	3.0
HRM 160	Laws of the Hospitality Industry (RCBC= HOS 260 [3])	3.0

HRM 190 & HRM 399	Industry Hours I (RCBC= HOS 265 [3])		4.0
HRM 355	Resort Management (RCBC= HOS 255 [3])		3.0
	Term Credits		16.0

Summer		
At Community College		
Social Science Elective (RCBC= Social Science Elective [3])		3.0
Arts and Humanities (RCBC= Arts and Humanities [3])		3.0
	Term Credits	6.0

Third Year

Fall		
At Drexel		
CULA 115	Culinary Fundamentals	3.0
FDSC 100	ServSafe	1.0
HRM 155	Hotel Customer Service	3.0
HRM 370	Gaming and Casino Management I	3.0
MATH 107	Probability and Statistics for Liberal Arts	3.0
	Term Credits	13.0

Winter		
At Drexel		
ACCT 110	Accounting for Professionals	4.0
HRM 290	Industry Hours II	1.0
HRM 345	Convention Management	3.0
HRM 371	Gaming and Casino Management II	3.0
MATH 182	Mathematical Analysis II	3.0
Language		4.0
	Term Credits	18.0

Spring		
At Drexel		
CO-OP		
	Term Credits	0.0

Summer		
At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall		
At Drexel		
HRM 215	Commercial Food Production	4.0
HRM 390	Industry Hours III	1.0
MIS 200	Management Information Systems	4.0
NFS 100	Nutrition, Foods, and Health	2.0
NFS 101	Introduction to Nutrition & Food	1.0
Language		4.0
	Term Credits	16.0

Winter		
At Drexel		
COM 181	Public Relations Principles and Theory	3.0
ECON 201	Principles of Microeconomics	4.0
HRM 330	Hospitality Marketing and Branding	3.0
HRM 335	Beverage Management	3.0
HRM 490	Industry Hours IV	1.0
Language		4.0
	Term Credits	18.0

Spring		
At Drexel		
CO-OP		
	Term Credits	0.0

Summer		
At Drexel		

CO-OP

	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
COM 230	Techniques of Speaking	3.0
HRM 425	Hospitality Industry Administration	3.0
HRM 495	Industry Hours V	1.0
MKTG 201	Introduction to Marketing Management	4.0
Business		4.0
	Term Credits	15.0
Winter		
At Drexel		
COM 270 [WI]	Business Communication	3.0
HRM 455	Hospitality Human Resources Management	3.0
HRM 450	Hospitality Leadership Seminar	3.0
INFO 101	Introduction to Computing and Security Technology	3.0
ORGB 300 [WI]	Organizational Behavior	4.0
	Term Credits	16.0

Total Credit: 166.5

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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Transfer Credits

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BS in Materials Science and Engineering

Drexel Degree Name: B.S in Materials Science and Engineering

Community College Degree Name: A.S in Engineering

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

68 Credits at RCBC transfer over as 83.5 Credits at Drexel

Please contact the Department of Materials Science and Engineering **(**https://drexel.edu/engineering/academics/departments/materials-science-engineering/**) for the most current Plan of Study.**

First Year		
Fall		**Credits**
At Community College		
MATH 121	Calculus I (RCBC= MTH 118 [4])	4.0
CHEM 101	General Chemistry I (RCBC= CHE 115 & 116 [4])	3.5
ENGR 111	Introduction to Engineering Design & Data Analysis (RCBC= CSE 135 [3])	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3]) English Composition I	3.0
	Term Credits	13.5
Spring		
At Community College		
MATH 122 & MATH 123	Calculus II (RCBC= MTH 119 [4])	8.0
PHYS 101	Fundamentals of Physics I (RCBC=PHY 210 & 211 [4])	4.0
CHEM 102	General Chemistry II (RCBC= CHEM 117 & 118 [4])	4.5
ENGR 113	First-Year Engineering Design (RCBC= EGR 104 [3])	3.0
	Term Credits	19.5
Summer		
At Community College		
MATH 200	Multivariate Calculus (RCBC= MTH 220 [4])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3])	6.0
Trasnfer Free Elective (RCBC= History Elective [3])		4.5
	Term Credits	14.5
Second Year		
Fall		
At Community College		
MEM 202	Statics (RCBC= EGR 201 [3])	3.0
PHYS 102	Fundamentals of Physics II (RCBC= PHY 212 & 213 [4])	4.0
Transfer Free Elective (RCBC= Diversity Elective [3])		4.5
ECON 201	Principles of Microeconomics (RCBC= ECO 203 [3])	4.0
	Term Credits	15.5
Spring		
At Community College		
ECON 202	Principles of Macroeconomics (RCBC= ECO 204 [3])	4.0
MATH 210 or ENGR 232	Differential Equations (RCBC= MTH 230 [4]) Dynamic Engineering Systems	4.0

Transfer Free Elective (RCBC= Arts/Humanities Elective [3])		4.5
MEM 238	Dynamics (RCBC= EGR 202 [3])	4.0
	Term Credits	16.5
Summer		
At Community College		
MATH 201	Linear Algebra (RCBC= MTH 201 [3])	4.0
or ENGR 231	Linear Engineering Systems	
	Term Credits	4.0
Third Year		
Fall		
At Drexel		
ENGR 220	Fundamentals of Materials	4.0
COOP 101	Career Management and Professional Development	0.0
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
PHIL 315	Engineering Ethics	3.0
	Term Credits	11.0
Winter		
At Drexel		
MATE 230	Fundamentals of Materials II	4.0
ENGR 210	Introduction to Thermodynamics	3.0
CHEM 241	Organic Chemistry I	4.0
CIVC 101	Introduction to Civic Engagement	1.0
	Term Credits	12.0
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fourth Year		
Fall		
At Drexel		
MATE 214	Introduction to Polymers	4.0
MATE 240	Thermodynamics of Materials	4.0
MATE 355	Structure and Characterization of Crystalline Materials	3.0
MATE 370	Mechanical Behavior of Solids	3.0
	Term Credits	14.0
Winter		
At Drexel		
MATE 245	Kinetics of Materials	4.0
MATE 315	Processing Polymers	0.0-4.5
MATE 341	Defects in Solids	3.0
ECON 202	Principles of Macroeconomics	4.0
	Term Credits	11.0-15.5
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Fifth Year		
Fall		
At Drexel		
MATE 455	Biomedical Materials	3.0
MATE 366 [WI]	Processing of Metallic Materials	4.5
MATE 280	Advanced Materials Laboratory	4.0

Tech/Track Elective		3.0
	Term Credits	14.5
Winter		
At Drexel		
Tech Elective/Track Course		3.0
MATE 345	Processing of Ceramics	4.5
MATE 351	Electronic and Photonic Properties of Materials	4.0
CHEC 353	Physical Chemistry and Applications III	4.0
	Term Credits	15.5
Spring		
At Drexel		
CO-OP		
	Term Credits	0.0
Summer		
At Drexel		
CO-OP		
	Term Credits	0.0
Sixth Year		
Fall		
At Drexel		
MATE 491 [WI]	Senior Project Design I	2.0
MATE 460	Engineering Computational Laboratory	4.0
CHE 350	Statistics and Design of Experiments	3.0
Tech/Track Elective		3.0
	Term Credits	12.0
Winter		
At Drexel		
MATE 492	Senior Project Design II	3.0
Tech/Track Elective		3.0
	Term Credits	6.0
Spring		
At Drexel		
MATE 493 [WI]	Senior Project Design III	3.0
MATE 410	Case Studies in Materials	3.0
Tech/Track Elective		3.0
	Term Credits	9.0

Total Credit: 188.5-193.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Mathematics

Drexel Degree Name: B.S. Mathematics

Community College Degree Name: A.S in Mathematics

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

61 Credits at RCBC transfer over as 80.5 - 84 Credits at Drexel

Please contact the Department of Mathematics **(**https://drexel.edu/coas/academics/departments-centers/mathematics/**) for the most current Plan of Study.**

First Year

Fall		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3]) English Composition I	3.0
MATH 121	Calculus I (RCBC= MTH 118 [4])	4.0
PHYS 101	Fundamentals of Physics I (RCBC= PHY 210 and PHY 211 [4])	4.0
CS 150	Computer Science Principles (RCBC = CSE 110 [4])	3.0
	Term Credits	14.0

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3])	6.0
MATH 122 & MATH 123	Calculus II (RCBC= MTH 119 [4])	8.0
Any BIO or CHEM (RCBC =BIO 103 [3] & BIO 104 [1], BIO 107 [3] & BIO 108 [1] OR CHE 107 [3] & CHE 108[1] or CHE 115 [3] & CHE 116 [1])		3.5-5.0
International/Diversity Elective (RCBC= Elective [3])		3.0
	Term Credits	20.5-22.0

Summer		
Social Science (RCBC = any HIST [3])		4.0
Social Science (RCBC = any PSY, SOC, ANT, ECO, HIS, POL [3])		3.0-4.0
	Term Credits	7.0-8.0

Second Year

Fall		
At Community College		
MATH 200	Multivariate Calculus (RCBC= MTH 220 [4])	4.0
MATH 201	Linear Algebra (RCBC= MTH 201 [3])	4.0
MATH 210	Differential Equations (RCBC = MTH 230 4])	4.0
Social Science (RCBC = Any PSY, SOC, ANT, ECO, HIS, POL [3])		3.0-4.0
	Term Credits	15.0-16.0

Spring		
At Community College		
MATH 221	Discrete Mathematics (RCBC = MTH 226 [3])	3.0
Humanities Elective (RCBC = any ART, MUS, COM, LIT, PHI [3])		3.0
Free Elective (RCBC any two courses [6])		6.0
Excess free elective credits from semester to Drexel credits		12.0
	Term Credits	24.0

Third Year

Fall		
At Drexel		
MATH 220 [WI]	Introduction to Mathematical Reasoning	3.0
MATH Elective		4.0
Social Science		3.0
Any CHEM		3.5
CS 171	Computer Programming I	3.0
COOP 101	Career Management and Professional Development	0.0
	Term Credits	16.5

Winter		
At Drexel		
Math Major Electives		6.0
Free Elective		3.0
Free Elective		4.0
CS 172	Computer Programming II	3.0
	Term Credits	16.0

Spring		
At Drexel		
CO-OP		
	Term Credits	0.0

Summer		
At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall		
At Drexel		
MATH 331	Abstract Algebra I	4.0
MATH elective		3.0
COM 230	Techniques of Speaking	3.0
Humanities Elective		3.0
Free Elective		3.0
	Term Credits	16.0

Winter		
At Drexel		
MATH 332	Abstract Algebra II	3.0
Math electives		6.0
UNIV S201	Looking Forward: Academics and Careers	1.0
Social Science elective		3.0
	Term Credits	13.0

Spring		
At Drexel		
CO-OP		
	Term Credits	0.0

Summer		
At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall		
At Drexel		
MATH 401	Elements of Modern Analysis I	3.0
Math Elective		4.0

Free elective		6.0
	Term Credits	13.0

Winter
  At Drexel

MATH 402	Elements of Modern Analysis II	3.0
Math Electives		7.0
International/Diversity Elective		3.0
	Term Credits	13.0

Spring
  At Drexel

Math electives		7.0
Free electives		6.0
	Term Credits	13.0

Total Credit: 181.0-184.5

Transfer Credits
Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Mechanical Engineering

Drexel Degree Name: B.S in Mechanical Engineering

Community College Degree Name: A.S in Engineering

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

64 Credits at RCBC transfer over as 85.5 Credits at Drexel

Please contact the Department of Mechanical Engineering and Mechanics **(**https://drexel.edu/engineering/academics/departments/mechanical-engineering/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
CHEM 101	General Chemistry I (RCBC= CHE 115 & 116 [4])	3.5
CS 190[*]	Selected Computer Language (RCBC= CSE 135 [3])	3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3]) English Composition I	3.0
MATH 121	Calculus I (RCBC= MTH 118 [4])	4.0
	Term Credits	13.5

Spring
  At Community College

CHEM 102 & CHEM 103	General Chemistry II (RCBC= CHE 117 & 118 [3])	9.5
ENGR 113 & ENGR 111	First-Year Engineering Design (RCBC= EGR 104 [4])	6.0
MATH 122 & MATH 123	Calculus II (RCBC= MTH 119 [4])	8.0
PHYS 101	Fundamentals of Physics I (RCBC= PHY 210 & 211 [3])	4.0
	Term Credits	27.5

Summer
  At Community College

MATH 200	Multivariate Calculus (RCBC= MTH 220 [4])	4.0
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3])	3.0
TGEE 099 (RCBC= History Elective [3])		4.5
	Term Credits	11.5

Second Year
Fall
  At Community College

MEM 202	Statics (RCBC= EGR 201 [3])	3.0
PHYS 102	Fundamentals of Physics II (RCBC= PHY 212 & 213 [4])	4.0
Transfer Free Elective (RCBC= Diversity Elective [3])		4.5
Trasnfer Free Elective (RCBC= Social Science Group A [3])		4.5
	Term Credits	16.0

Spring
  At Community College

MATH 210	Differential Equations (RCBC= MTH 230 [4])	4.0
MEM 238	Dynamics (RCBC= EGR 202 [3])	4.0
Transfer Free Elective (RCBC= Social Science Group B [3])		4.5
Transfer Free Elective (RCBC= Arts/Humanities Elective [3])		4.5
	Term Credits	17.0

Summer
  At Community College

MATH 201	Linear Algebra (RCBC= MTH 201 [3])	4.0
	Term Credits	4.0

Third Year
Fall
  At Drexel

COOP 101	Career Management and Professional Development	0.0
ENGR 220	Fundamentals of Materials	4.0
HIST 285	Technology in Historical Perspective	4.0
MEM 201	Foundations of Computer Aided Design	3.0
MEM 230	Mechanics of Materials I	4.0
UNIV E101	The Drexel Experience	1.0
	Term Credits	16.0

Winter
  At Drexel

CIVC 101	Introduction to Civic Engagement	1.0
ENGR 210	Introduction to Thermodynamics	3.0
MEM 255	Introduction to Controls	4.0
MEM 333	Mechanical Behavior of Materials	3.0
MEM 331	Experimental Mechanics I	2.0
CHEM 102	General Chemistry II	4.5
	Term Credits	17.5

Spring
  At Drexel

CO-OP		
PHIL 315	Engineering Ethics	3.0
	Term Credits	3.0

Summer
  At Drexel

CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel

MEM 310	Thermodynamic Analysis I	4.0
MEM 345	Heat Transfer	4.0
MEM 391	Introduction to Engineering Design Methods	1.0
MEM 355	Performance Enhancement of Dynamic Systems	4.0
MEM 435	Introduction to Computer-Aided Design and Manufacturing	4.0
	Term Credits	17.0

Winter

At Drexel

MEM 351	Dynamic Systems Laboratory I	2.0
MEM 220	Fluid Mechanics I	4.0
MEM 361	Engineering Reliability	3.0
MEM Fund Electives		6.0-8.0
	Term Credits	15.0-17.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

MEM 491 [WI]	Senior Design Project I	2.0
MATH/SCI Elective		4.0
MEM Fundamental Elective		6.0-8.0
	Term Credits	12.0-14.0

Winter

At Drexel

MEM 492 [WI]	Senior Design Project II	3.0
MEM 311	Thermal Fluid Science Laboratory	2.0
MEM or COE Elective 300+		6.0
MEM Elective 300+		3.0
MATH/SCI Elective		3.0
	Term Credits	17.0

Spring

At Drexel

BIO 141	Essential Biology	4.5
CIVE 240 [WI]	Engineering Economic Analysis	3.0
MEM 493 [WI]	Senior Design Project III	3.0
MEM Elective 300+		3.0
	Term Credits	13.5

Total Credit: 200.5-204.5

*   Sub for ENGR 131 for non ECE students.

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog may indicate that this course can fulfill a writing-intensive requirement. For the most up-to-date list of writing-intensive courses being offered, students should check the Writing Intensive Course List (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/writing-intensive-courses/) at the University Writing Program (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/). (http://drexel.edu/coas/academics/departments-centers/english-philosophy/university-writing-program/drexel-writing-center/) Students scheduling their courses can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

BS in Psychology

Drexel Degree Name: B.S. Psychology

Community College Degree Name: A.A in Psychology

Sample Plan of Study - First & Second Year at Rowan College at Burlington County

64 Credits at RCBC transfers over as 90 Credits at Drexel

Contact the Department of Psychology **(**https://drexel.edu/coas/academics/departments-centers/psychology/**) for the most current Plan of Study**

First Year

Fall		Credits
At Community College		
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (RCBC= ENG 101 [3]) English Composition I	3.0
MATH 101	Introduction to Analysis I (RCBC= Mathematics *take MTH 130 [4])	4.0
PSY 101	General Psychology I (RCBC= Social Science: PSY 101 [3])	3.0
Free Elective (RCBC= Social Science [3])		3.0
PSY 240 [WI]	Abnormal Psychology (RCBC= PSY Program Course Credits *take PSY 255 [3])	3.0
	Term Credits	16.0

Spring		
At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (RCBC= ENG 102 [3])	6.0
CS 161	Introduction to Computing (RCBC= CIS 101 or CIS 161 [3])	3.0
History Elective (RCBC= History [3])		4.0

PSY 120	Developmental Psychology (RCBC=PSY Program Course Credits *Take PSY 256 [3])	3.0
MATH 102	Introduction to Analysis II (RCBC= Elective *take MTH 118 [4])	4.0
	Term Credits	20.0

Second Year

Fall

At Community College

COM 230	Techniques of Speaking (RCBC= SPE 102 [3])	3.0
BIO 107	Cells, Genetics & Physiology (RCBC= BIO 103 [3])	3.0
BIO 108	Cells, Genetics and Physiology Laboratory (RCBC= BIO 104 [1])	1.0
Free Elective (RCBC= Diversity Course [3])		3.0
PSY 140	Approaches to Personality (RCBC= PSY Program Course Credits *take PSY 258 [3])	3.0
Free Elective (RCBC=Social Science [3])		3.0
	Term Credits	16.0

Spring

At Community College

History Elective (RCBC= History [3])		4.0
BIO 109	Biological Diversity, Ecology & Evolution (RCBC= BIO 107 [3])	3.0
BIO 110	Biological Diversity, Ecology and Evolution Laboratory (RCBC= BIO 108 [1])	1.0
Free Elective (RCBC= Elective [3])		3.0
PSY 150	Introduction to Social Psychology (RCBC=PSY Program Course Credits *take PSY 259 [3])	3.0
Free Elective (RCBC= Elective [3])		3.0
Excess Free Elective Credit from Semester to Drexel Credits		21.0
	Term Credits	38.0

Third Year

Fall

At Drexel

PSY 264	Computer-Assisted Data Analysis I	3.0
Anthropology Elective		3.0
Free Elective		3.0
PSY Advanced Elective		3.0
PSY Advanced Elective		3.0
COOP 101	Career Management and Professional Development	0.0
	Term Credits	15.0

Winter

At Drexel

PSY 265	Computer-Assisted Data Analysis II	3.0
PSY 330	Cognitive Psychology	3.0
SOC/Free Elective		3.0
CIVC 101	Introduction to Civic Engagement	1.0
PSCI Elective		4.0
UNIV H201	Looking Forward: Academics and Careers	1.0
	Term Credits	15.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fourth Year

Fall

At Drexel

PSY 212	Physiological Psychology	3.0
Free Elective		2.0
PSY 360 [WI]	Experimental Psychology	3.0
English Lit Elective		3.0

PSY 325	Psychology of Learning	3.0
	Term Credits	14.0

Winter

At Drexel

PSY 280	Psychological Research I	3.0
Fine Arts Elective		3.0
PSY Advanced Elective		3.0
PSY Advanced Elective		3.0
Business Elective		4.0
	Term Credits	16.0

Spring

At Drexel

CO-OP

	Term Credits	0.0

Summer

At Drexel

CO-OP

	Term Credits	0.0

Fifth Year

Fall

At Drexel

PSY 290	History and Systems of Psychology	3.0
PHIL Elective		3.0
PSY 380	Psychological Testing and Assessment	3.0
PSY Advanced Elective		3.0
English Lit Elective		3.0
	Term Credits	15.0

Winter

At Drexel

Free Elective		3.0
Free Elective		3.0
PSY Advanced Elective		3.0
PSY Advanced Elective		3.0
PSY Advanced Elective		3.0
	Term Credits	15.0

Total Credit: 180.0

Writing-Intensive Course Requirements

In order to graduate, all students must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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Transfer Credits

Transfer Credits

To receive transfer credits, the courses must be substantially equivalent to courses offered in the desired curriculum at Drexel and students must have completed the courses with a grade of C (C=2.0) or better. The transfer courses listed should be used as a general guide and might not be acceptable for every major at the University. Drexel University makes every effort to keep this guide current, but cannot guarantee that every course will be acceptable for transfer. The number of credits a student can transfer will be determined by the academic department once the student has been accepted into the program.

Union County College

Degree Programs in the College of Arts and Sciences

- BS in Environmental Science (p. 748)

BS in Environmental Science

Drexel Degree: B.S. in Environmental Science
Community College Degree: A.S in Sustainability Science

64 Credits from Union County College Transfers as 90 Credits to Drexel

Sample Plan of Study - First & Second Year at Union County College

Please contact the Department of Biodiversity, Earth & Environmental Science **(**https://drexel.edu/coas/academics/departments-centers/bees/**) for the most current Plan of Study.**

First Year

Fall

		Credits
At Community College		
CHEM 101	General Chemistry I (UCC= CHE 111 [4])	3.5
ENSS Elective (UCC= EGG 107 [3])		3.0
ENGL 101 or 111	Composition and Rhetoric I: Inquiry and Exploratory Research (UCC= ENG 101 [3]) English Composition I	3.0
MATH 121	Calculus I (UCC= MAT 171 [4])	4.0
TGFE 099		3.0
	Term Credits	16.5

Spring

At Community College		
ENGL 102 & ENGL 103	Composition and Rhetoric II: Advanced Research and Evidence-Based Writing (UCC= ENG 102 [3])	6.0
CHEM 102 & CHEM 103	General Chemistry II (UCC= CHE 112 [4])	9.5
MATH 122 & MATH 123	Calculus II (UCC= MAT 172 [4])	8.0
PHYS 152	Introductory Physics I (UCC= PHY 101 [4])	4.0
TGFE 099		4.0
	Term Credits	31.5

Second Year

Fall

At Community College		
BIO 122	Cells and Genetics (UCC= BIO 111)	4.5
TGFE 099		4.0
GEO 101	Physical Geology (UCC= GEY 101 [4])	4.0
HUM/SS Elective (UCC= HIS 101 or HIS 102 [3])		3.0
	Term Credits	15.5

Spring

At Community College		
PHYS 152 & 152 & PHYS 154	Introductory Physics I (UCC= PHY 201 or PHY 102)	8.0

BIO 124 & BIO 126	Evolution & Organismal Diversity (UCC= BIO 122)	9.0
TGFE 099		4.5
THSE 099		4.5
	Term Credits	26.0

Third Year

Fall

At Drexel		
ENVS 101	Introduction to Environmental Science	5.0
ENVS 201	Practical Identification of Plants and Animals	2.0
COM 230	Techniques of Speaking	3.0
PHIL 340 or 341	Environmental Ethics Environmental Philosophy	3.0
CIVC 101	Introduction to Civic Engagement	1.0
	Term Credits	14.0

Winter

At Drexel		
ENVS 202	Tree of Life	2.0
GEO 201 [WI]	Earth Systems Processes	3.0
ENVS 308	GIS and Environmental Modeling	3.0
COM 310 [WI]	Technical Communication	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
	Term Credits	12.0

Spring

At Drexel		
CO-OP		
GEO 103	Introduction to Field Methods in Earth Science	2.0
	Term Credits	2.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fourth Year

Fall

At Drexel		
ENVS 212	Evolution	4.0
ENVS 203	The Watershed Approach	2.0
MATH 410	Scientific Data Analysis I	3.0
ENVS 310	Introduction to Environmental Chemistry	3.0
ENVS Elective		3.0
	Term Credits	15.0

Winter

At Drexel		
Concentration Course		3.0
MATH 411	Scientific Data Analysis II	3.0
Concentration Course		3.0
ENVS Elective		3.0
ENVS Lab		2.0
	Term Credits	14.0

Spring

At Drexel		
CO-OP		
	Term Credits	0.0

Summer

At Drexel		
CO-OP		
	Term Credits	0.0

Fifth Year

Fall

At Drexel		
ENVS 441 [WI]	Issues in Global Change I: Seminar	2.0

Concentration Course		3.0
ENVS Elective		3.0
Free Elective		4.0
	Term Credits	12.0
Winter		
At Drexel		
ENVS 442	Issues in Global Change II: Research	2.0
Concentration Course		3.0
ENVS 302	Environmental Chemistry Laboratory	2.0
ENVS Elective		4.0
	Term Credits	11.0
Spring		
At Drexel		
ENVS 443	Issues in Global Change III: Synthesis	2.0
Concentration Course		3.0
ENVS Elective		3.0
Free Elective		4.0
	Term Credits	12.0

Total Credit: 181.5

Writing-Intensive Course Requirements

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Course Descriptions

Quarter

Undergraduate

Antoinette Westphal College of Media Arts & Design (A)

College of Arts and Sciences (AS)

LeBow College of Business (B)

Close School of Entrepreneurship (C)

Center for Food & Hospitality Management (CH)

College of Computing and Informatics (CI)

Center for Civic Engagement (CV)

College of Engineering (E)

Goodwin College of Professional Studies (GC)

College of Nursing & Health Professions (NH)

Pennoni Honors College (PE)

Dornsife School of Public Health (PH)

School of Biomedical Engineering, Science & Health Systems (R)

School of Education (T)

University Courses (X)

Accounting

Courses

ACCT 110 Accounting for Professionals 4.0 Credits
The course is open only to non-business students. A nontechnical introduction to the principles of financial and managerial accounting with emphasis on the use and interpretation of financial reports, managerial planning and control. The course would also provide an overview of business entities and taxation for businesses and individuals. The course is for the individual who seeks a basic knowledge of accounting and its uses. It is designed for the user of accounting information rather than the preparer. This course cannot be substituted for ACCT 115 or 116. Students graduating with a major in the School of Business cannot receive credit for this course.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

ACCT 115 Financial Accounting Foundations 4.0 Credits
Introduces preparation of the income statement and the balance sheet.
Covers analysis and recording of business transactions and a detailed
study of accounting for assets, liabilities, and equity.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

ACCT 116 Managerial Accounting Foundations 4.0 Credits
Introduces the managerial accounting tools and models available for
planning and projecting, controlling, and business analysis with an
emphasis on decision-making. Covers budgeting, product costing, and
analysis and projection of financial statements for internal purposes.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: ACCT 115 [Min Grade: D] or ACCT 110 [Min Grade: D]

ACCT 120 Accounting Essentials for New Ventures 4.0 Credits
The course covers essential accounting topics specific to new
entrepreneurial ventures. Topics include: Financial Statement, cash flow
issues, cost accounting, tax calculations, and choice of business entity.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

ACCT 320 Fundamentals of Accounting for New Ventures 4.0 Credits
This course helps students develop an understanding of the key elements
of designing an accounting system and support policies and procedures
for a new business venture.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.
Prerequisites: ACCT 115 [Min Grade: C] and ACCT 116 [Min Grade: C]

ACCT 321 Financial Reporting I 4.0 Credits
Provides intensive review of preparation of the income statement and
balance sheet. Covers current accounting practice in light of authoritative
pronouncements and critical study of theory and practice relating to
accounting for current assets.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ACCT 115 [Min Grade: C]

ACCT 322 Financial Reporting II 4.0 Credits
Continues critical study of accounting theory and practice relating to
financial statement items. The emphasis is on accounting principles
underlying the measurement, recognition and reporting of long-lived
tangible and intangible assets and long-term liabilities including bonds,
pensions, and leases.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ACCT 321 [Min Grade: C]

ACCT 323 Financial Reporting III 4.0 Credits
Provides a detailed analysis of higher level financial accounting topics
including equity transactions, accounting for income taxes, investments,
and the statement of cash flows. Connects topics learned in all financial
reporting classes and requires successful completion of a senior project
on financial reporting.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ACCT 322 [Min Grade: C]

ACCT 329 Advanced Accounting 4.0 Credits
Study of accounting theory and practice in advanced topics including
investments, consolidations, foreign currency transactions, and other
current accounting topics.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: ACCT 322 [Min Grade: C]

ACCT 331 Cost Accounting 4.0 Credits
Continues and expands the study of managerial accounting with an
emphasis on cost accounting, internal reporting, analyzing accounting
information for planning and projecting and making strategic short and
long term business decisions through the use of case studies and/or
projects.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ACCT 116 [Min Grade: C]

ACCT 341 Principles of Auditing 4.0 Credits
Covers auditing standards and professional ethics, auditing theory and
concepts, audit evidence and procedures, and auditors' reports.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ACCT 322 [Min Grade: C]

ACCT 344 Internal Auditing 4.0 Credits
Internal Auditing brings a systematic, disciplined approach to evaluate and
improve the effectiveness of risk management, control and governance
processes. It is designed to add value and improve an organization's
operations. Topics covered include: The Institute of Internal Auditors'
International Professional Practices Framework; risk assessment,
including internal control system evaluation; and the relationship of
management and employee fraud to the internal audit process. Outside
speakers and case studies will be used to demonstrate the application of
internal auditing practices in the real world.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

ACCT 360 Lead & Learn: Financial Accounting 4.0 Credits
This course supports, enhances and expands your knowledge of financial
accounting through collaborative learning and delivery of workshops. The
course provides a variety of study strategies and employs professional
development exercises to assist in improving your understanding of
financial accounting, assimilating fundamental learning competencies,
and building critical thinking and presentation skills while you lead and
facilitate workshops on specific financial accounting topics.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ACCT and classification is Junior or
Senior.
Prerequisites: ACCT 321 [Min Grade: B] and ACCT 322 [Min Grade: B]

ACCT I199 Independent Study in ACCT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ACCT I299 Independent Study in ACCT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ACCT I399 Independent Study in ACCT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ACCT I499 Independent Study in ACCT 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ACCT T180 Special Topics in ACCT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ACCT T280 Special Topics in ACCT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ACCT T380 Special Topics in ACCT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ACCT T480 Special Topics in ACCT 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

Advertising Design

Courses

ADGD I199 Independent Study in ADGD 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ADGD I299 Independent Study in ADGD 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ADGD I399 Independent Study in ADGD 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ADGD I499 Independent Study in ADGD 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ADGD T180 Special Topics in Advertising Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ADGD T280 Special Topics in Advertising Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ADGD T380 Special Topics in Advertising Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ADGD T480 Special Topics in Advertising Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Africana Studies

Courses

AFAS 101 Introduction to Africana Studies 3.0 Credits
Provides an overview of the experience, culture, and political practices
of African descendants in the Americas and the Caribbean. The course
uses a multidisciplinary approach to introduce students to the history, art,
music, and literature of the African Diaspora.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

AFAS 201 Cross Currents in Africana Studies 3.0 Credits
With a temporal focus on the 20th century, this course critically explores
and analyzes the cultural, political and intellectual practices of blacks in
North, Central, and South America as well as in the Caribbean.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

AFAS 210 Topics in Africana Arts 1.0-12.0 Credit
This course will focus on the literatures/music/or culture of the Africana
Diaspora. The topics covered in this course will change from quarter to
quarter and will often be offered in collaboration with other departments
on campus.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 48 credits

AFAS 220 Topics in Africana Society 1.0-12.0 Credit
This course will take a social science approach to the study of the
societies of the African Diaspora inside of the US or internationally. The
topics covered in this course will change from quarter to quarter and will
often be offered in collaboration with other departments on campus.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 48 credits

AFAS 230 Topics in African History 1.0-12.0 Credit
This course will provide students with a historical understanding of African
Societies from the medieval period to the present. The topics covered in
this course will change from quarter to quarter and will often be offered in
collaboration with other departments on campus.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 48 credits

AFAS 240 Topics in Africana Current Events 1.0-12.0 Credit
This topical course will offer students the chance to focus on current
events in the global Africana Diaspora. The topics covered in this
course will change from quarter to quarter and will often be offered in
collaboration with other departments on campus.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 48 credits

AFAS 255 Gender & Black Popular Culture 3.0 Credits
This course critically examines the media's role in the social construction
of "Blackness." Paying particular attention to images of race, culture and
gender, this course examines representations of Black women and men in
"popular culture" (film, television, music, advertising, etc.).
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

AFAS 260 Race, Politics and Religion 3.0 Credits
An examination of race and religion as in liberal tradition. How has liberal
theory purported the state will confront issues of race and religion? Have
the political realities of race and religion in the modern state lived up to the
promises laid out by liberalism?.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

AFAS 301 Politics of Hip Hop 3.0 Credits
This class in an interdisciplinary, socio-historical introduction to rap music
and hip hop culture. Several themes will be explored including the origins
of rap music as well as the role of urban youth and their notions of race
and gender. Record industry practices will also be investigated together
with the impact of commercialism on hip hop. We will also consider
sexism, misogyny, and violence in both the music and culture.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

AFAS 310 Women, Crime, & History 3.0 Credits
This class will examine gender, race and crime in US history. Specifically,
we will explore the experience of female criminals from the colonial period
to the present. We will conduct primary research into this subject at the
Philadelphia City Archive (PCA), located at 3101 Market Street. Students
will be responsible for a final research paper based on their research
findings.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

AFAS 385 Rum, Rice and Revolution: Caribbean History 3.0 Credits
Course provides a broad, interdisciplinary and socio-historical introduction
to the Caribbean. Several themes are covered including empire and the
making of the Caribbean; slavery and emancipation; labor formation
and race; revolution and resistance; gender oppression and women's
experiences; and cultural expressions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

AFAS 401 Urban Social Justice Practicum I 3.0 Credits
The Urban Social Justice Practicum offers Drexel students an exciting
opportunity to work on-site at a variety of community based organizations
that address issues relevant to the African Diaspora. Students can work
as mentors, teaching assistants, and interns and inner-city schools,
governmental agencies, judicial offices and health care facilities. Working
5 hours per week at a site of their choosing, students also participate in
weekly seminars, maintain journals, and complete a final paper. Course
runs over two quarters.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

AFAS 402 Urban Social Justice Practicum II 3.0 Credits
The Urban Social Justice Practicum offers Drexel students an exciting
opportunity to work on-site at a variety of community based organizations
that address issues relevant to the African Diaspora. Students can work
as mentors, teaching assistants, and interns and inner-city schools,
governmental agencies, judicial offices and health care facilities. Working
5 hours per week at a site of their choosing, students also participate in
weekly seminars, maintain journals, and complete a final paper. Course
runs over two quarters.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: AFAS 401 [Min Grade: CR]

AFAS I199 Independent Study in AFAS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

AFAS I299 Independent Study in AFAS 0.5-3.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 2 times for 6 credits

AFAS I399 Independent Study in AFAS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

AFAS I499 Independent Study in AFAS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

AFAS T180 Special Topics in Africana Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

AFAS T280 Special Topics in Africana Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

AFAS T380 Special Topics in Africana Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

AFAS T480 Special Topics in Africana Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Anatomy

Courses

ANAT 101 Anatomy & Physiology I 5.0 Credits
This course is a general study of the structures and physiology of the human body. Fundamental concepts of microscopic tissue structure, gross structures of organs and body system organization are taught. The course consists of both lecture and lab material. The lecture portion deals with the general principles. In the lab, the student participates with practical examination of microscopic sections, tissues and organs, and the anatomical layout of human cadavers. The cell, tissues and musculoskeletal system will be covered in this course, as well as muscle and nerve physiology.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

ANAT 102 Anatomy & Physiology II 5.0 Credits
This course is a continuation of ANAT 101. This course is a general study of the structures & physiology of the human body. Fundamental concepts of microscopic tissue structure, gross structures of organs and body system organization are taught. The course consists of both lab and lecture material. The lecture deals with the general principles. In the lab, the student participates with practical examination of microscopic sections, tissues and organs, and the anatomical layout of various animal cadavers. The nervous, endocrine and digestive system will be covered in this course.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ANAT 101 [Min Grade: D]

ANAT 103 Anatomy & Physiology III 5.0 Credits
This course is a continuation of ANAT 101 & 102. This course is a general study of the structures and physiology of the human body. Fundamental concepts of microscopic tissue structure, gross structures of organs and body system organization are taught. The course consists of both lab and lecture material. The lecture deals with the general principles. While in the lab, the student participates with practical examination of microscopic sections, tissues, organs and the anatomical layout of various animal cadavers. The cardiovascular, lymphatic, respiratory, urinary and reproductive systems will be covered.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ANAT 102 [Min Grade: D]

ANAT 202 Sectional Anatomy 3.0 Credits
This course reviews human anatomy of the head, neck, thorax, abdomen, pelvis and extremities. Relationships of surface and internal structures from different bodily systems are emphasized. The analysis is supported by anatomical illustrations, radiological images, and cadaver photographs.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

Animation

Courses

ANIM 100 Foundational Tools for Animation & VFX 3.0 Credits
Students will learn fundamentals of core tools in Digital Animation & Visual Effects related disciplines. Tools introduced include pixel based image manipulation tools (such as Photoshop), vector based graphics tools (such as Illustrator), video and animation compositing tools (such as After Effects and Nuke) and 3D CGI tools (such as Maya). Animation and visual effects related applications introduced include digital image alteration, digital matte painting, three dimensional type creation, and other foundational animation and visual effects tasks.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ANIM 110 Digital Imaging for Animation & VFX 3.0 Credits
Students learn foundational image acquisition, lighting and processing techniques and principles utilized in Animation & VFX disciplines. Topics covered include digital still and video imaging and lighting fundamentals for reference and background gathering, texture creation, normal map sampling, spherical and high dynamic range acquisition, location survey and more.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ANIM 100 [Min Grade: D] or DIGM 100 [Min Grade: D] or PHTO 141 [Min Grade: D] or VSCM 200 [Min Grade: D] or GMAP 101 [Min Grade: D]

ANIM 115 Introduction to Production with Animation & VFX 3.0 Credits
This course introduces students to many of the core principles, techniques and technologies employed in the creation of media incorporating animation and visual effects. The basics of planning and shooting live action, greenscreen and still image media are introduced in conjunction with design, creation, animation and compositing of both 2D and 3D assets.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 211 [Min Grade: D] or ANIM 100 [Min Grade: D] or PHTO 141 [Min Grade: D] or VSCM 200 [Min Grade: D] or DIGM 100 [Min Grade: D]

ANIM 140 Computer Graphics Imagery I 3.0 Credits
Students learn to represent 3D objects and spaces in 2D media using a variety of drawing and computer graphic techniques. This course lays important foundations for subsequent courses in 3D computer modeling and animation.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: DIGM 100 [Min Grade: D] or VSCM 200 [Min Grade: D] or ANIM 100 [Min Grade: D] or PHTO 141 [Min Grade: D] or VRIM 100 [Min Grade: D] or GMAP 101 [Min Grade: D]

ANIM 141 Computer Graphics Imagery II 3.0 Credits
This course will introduce students to the principles and techniques of 3D virtual scene building for animation, visualization and game development.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: DIGM 110 [Min Grade: D] or ANIM 140 [Min Grade: D]

ANIM 145 Realtime Visualization 3.0 Credits
In this course, students learn principles and techniques of scene building in realtime, 3D interactive graphics engines for use in animation, visualization, game design, VR, AR and other forms of digital media.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ANIM 140 [Min Grade: D] or ARCH 134 [Min Grade: D] or INTR 245 [Min Grade: D]

ANIM 152 Multimedia Timeline Design 3.0 Credits
Introduces basic design concepts and tools to create time based 2D and 3D multimedia. Addresses issues from pre-production planning, through, post-production and delivery; emphasis on time-based multimedia.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ANIM 100 [Min Grade: D] or DIGM 100 [Min Grade: D] or PHTO 141 [Min Grade: D] or VSCM 200 [Min Grade: D] or GMAP 101 [Min Grade: D]

ANIM 155 Previsualization for Animated Production 3.0 Credits
Previsualization is the all-important design and planning process that takes place before embarking on the production of an animation or visual effects piece. In this course, student will learn and practice the creation, motivation and use of pre-production plans, concept art, mood boards, shot storyboarding, animatics, performance reference and other topics integral to the previsualization process.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ANIM 211 Animation I 3.0 Credits
Explores computer animation with an introduction to concepts of 3D animation. Includes narrative structure, storyboarding, and development. Emphasizes aesthetic, technical and conceptual issues. Requires students to create short, 3D animations.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ANIM 140 [Min Grade: D]

ANIM 212 Animation II 3.0 Credits
Builds on topics introduced in ANIM 211 Animation I, incorporating advanced animation techniques such as inverse kinematics and dynamics. Requires students to propose, design, and produce a short animation.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ANIM 211 [Min Grade: D]

ANIM 215 History of Animation 3.0 Credits
Students learn the pre-cursors to modern animation and the evolution of the art since the beginning of the 20th century. Concepts in both 2D and 3D animation will be covered.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ANIM 220 Digital Compositing I 3.0 Credits
Examines digital compositing possibilities through the manipulation and recombination of acquired and produced digital imagery, including study of digital image and video formats, color space, live action digital matte painting, Greenscreen/Bluescreen compositing, rotoscope masking and 2D tracking.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ANIM 100 [Min Grade: D] or DIGM 100 [Min Grade: D] or PHTO 141 [Min Grade: D] or VSCM 200 [Min Grade: D] or VRIM 100 [Min Grade: D]

ANIM 221 Digital Compositing II 3.0 Credits
Examines 2D and 3D digital compositing possibilities through the manipulation and recombination of acquired and produced digital imagery, including 2D/3D Integration, 3D Matchmoving, and High Dynamic Range Imagery.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ANIM 110 [Min Grade: D] and ANIM 211 [Min Grade: D] and ANIM 220 [Min Grade: D]

ANIM 231 Scripting for Animation and Visual Effects 3.0 Credits
This course explores modern scripting languages utilized in Animation and Visual Effects operating systems and software tools that are integral to artist productivity and production pipeline scalability.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: CS 140 [Min Grade: D] or CS 171 [Min Grade: D]

ANIM 247 Organic Modeling I 3.0 Credits
This course presents an intensive exploration of human character modeling and rigging for animation, with emphasis on human anatomy and articulation. Through lectures, demonstrations, class critiques and individual feedback from peers and the instructor, students will learn best practices for modeling human forms for animation and why these approaches are valid. Although the focus is on humans, the concepts and techniques presented for organic modeling, sculpting and rigging apply to all organic characters.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ANIM 212 [Min Grade: D]

ANIM 248 Advanced Lighting 3.0 Credits
Students will learn to integrate production-oriented lighting techniques into animation. Techniques utilizing both point-based and raytraced global illumination will be covered, and how to optimize pipelines for animation. Basic shader development will also be covered.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ANIM 141 [Min Grade: D] or DIGM 141 [Min Grade: D]

ANIM 250 Professional Practices for Animation & VFX 3.0 Credits
Provides a professional orientation to the animation and visual effects industry through an exploration of a variety of projects and studies. In addition to lecture and discussions, students learn to take active part in role plays and presentations to achieve an understanding of the importance of team building, team work, and team management in all phases of animation and visual effects productions from proposals to final delivery, as well as personal development and promotion through personal learning, development of work demonstration materials.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ANIM 212 [Min Grade: C] or ANIM 221 [Min Grade: C] or ANIM 247 [Min Grade: C]

ANIM 314 Character Animation I 3.0 Credits
In this course, students learn humanoid rigging, body mechanics, body language and theories of acting with emphasis on having characters emote and perform with deliberateness of action. The course will culminate with a two character pantomime animation that students will create with a partner.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ANIM 247 [Min Grade: D]

ANIM 315 Character Animation II 3.0 Credits
Students learn human facial deformation and movement as it's applied to thought driven character performance.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ANIM 314 [Min Grade: B]

ANIM 347 Organic Modeling II 3.0 Credits
In this course, students will learn organic modeling of creatures, both real and imagined, for animation, taking into consideration anatomy, articulation and the fundamentals of creature design. In addition, we'll look at various concepts and techniques for rigging animals and creatures as you'll develop and present your own creature, modeled, sculpted, rigged, and posed in a final animation.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ANIM 247 [Min Grade: B] and ANIM 315 [Min Grade: B]

ANIM 350 Experimental Animation Lab 3.0 Credits
In this lab course, students explore Animation as an art form. Animation's characteristic of being a malleable art form opens the possibility of limitless, novel expressions of ideas. Students explore how Animation can uniquely affect the human spirit toward higher levels of conceptual consideration and comprehension as a multi-sensory language that can speak to audiences universally and post-linguistically.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ANIM 314 [Min Grade: D]

ANIM 388 Spatial Data Capture 3.0 Credits
Students learn about the tools available to integrate components from the physical environment into computer animations and games. Aspects covered will be 3D scanning, motion capture and imaging techniques.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: DIGM 212 [Min Grade: D] or ANIM 212 [Min Grade: D] or GMAP 367 [Min Grade: D]

ANIM 410 Advanced Compositing 3.0 Credits
Students learn to create detailed visual effects, and the best methods to integrate them into live-action plates. Drawing on existing compositing and animation knowledge, students will work in groups to produce short visual effects sequences.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: (ANIM 219 [Min Grade: D] or ANIM 221 [Min Grade: D]) and ANIM 212 [Min Grade: D]

ANIM 411 Advanced Animation 3.0 Credits
This course explores a wide range of visual effects assets, both practical and synthetic. Projects focus on the creation of a comprehensive short animation.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: ANIM 212 [Min Grade: D]

ANIM 435 Technical Directing for Animation 3.0 Credits
Students learn the necessary toolsets for technical direction of animated films and visual effects. The topics covered include Pythos scripting, pipeline development and integration and creation of custom shaders to streamline production processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ANIM 219 [Min Grade: D] or DIGM 302 [Min Grade: D]

ANIM I199 Independent Study in Animation 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ANIM I299 Independent Study in Animation 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ANIM I399 Independent Study in Animation 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ANIM I499 Independent Study in Animation 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ANIM T180 Special Topics in Animation 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ANIM T280 Special Topics in Animation 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ANIM T380 Special Topics in Animation 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ANIM T480 Special Topics in Animation 3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Anthropology

Courses

ANTH 101 Introduction to Cultural Diversity 3.0 Credits
Examines the diversity that exists in human culture. Uses lectures, films, and discussions to examine and illustrate the relationship between humans and their social/cultural systems.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 110 Human Past: Anthropology and Prehistoric Archeology 3.0 Credits
Examines human origins from the australopithecines to the present, including both the physiological and archaeological records. Discusses new finds and new interpretations of evolution.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 111 Introduction to Biological Anthropology 3.0 Credits
Anthropology is the holistic study of the human condition. Biological anthropology is a subfield of the larger discipline that studies humankind as a zoological species. As biological anthropology is firmly rooted in evolutionary theory, the evolutionary biology of humans is the central focus of the course. Basic concepts of genetics, geology, paleontology, comparative anatomy, primate biology and material culture provide the foundation for understanding humanity's place in nature.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 112 Language, Culture & Cognition 3.0 Credits
This course is an introductory survey of three ways language is understood as a central element that glues together human culture; language around categories and taxonomies as shared perception; language origins and evolution; and language as socialization. An additional fourth unit on fieldwork methods in cross-cultural understanding and language starts to prepare you for future qualitative research.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 117 Introduction to World Religions 3.0 Credits
This course is meant to be a foundational course for the minor in religious studies. It introduces students to the world religions from an anthropological perspective. Hence the basic concerns of an anthropological approach – worldview, ritual, myth, and so forth – are introduced early and applied to each of the religions studied.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 120 Biblical Archaeology: The Archaeology of Israel and Jordan 3.0 Credits
Examines the archaeology of Israel and Jordan from the earliest human occupation until the Persian Conquest in 535 B.C. Discusses many places described in the Old Testament in an archaeological context.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 140 Anthropology of Food 3.0 Credits
Food impacts almost every part of human existence. Anthropologists study our relationship with food and how we use it to bond with others, celebrate or mourn,and keep our bodies going. In this course we will explore food from the first fire cooked meal through domestication, consumption, preparation, genetic modification, and the privatization of food production today. We will also view food through cultural eyes by learning how people throughout the world produce,consume, and enjoy food. We will reflect upon how our personal and cultural choices concerning food impact many aspects of our lives including our mental and physical health, self- image, social life, and identity.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 205 Imagining Africa 3.0 Credits
This course introduces students to Africa by exploring how Africa and Africans have been viewed, perceived or imagined by non-Africans; how such images and stories have affected Africans' roles in global politics, economy, and media; and how images and stories generated by Africans are used creatively to express a sense of African lives in public life, in the arts and in the sciences. The course includes multiple video screenings.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 210 [WI] Worldview: Science, Religion and Magic 3.0 Credits
Examines anthropological and archaeological evidence of the worldviews of non-literate people, as shown in the practice of ceremony, magic, sorcery, and witchcraft, and the role of shamans and priests. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ANTH 212 [WI] Topics in World Ethnography 3.0 Credits
Examines the peoples and cultures of the selected cultural areas. Emphasizes indigenous cultures and the effects of modernization on these cultures.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ANTH 215 Anthropology of Gender 3.0 Credits
This course takes an ethnographic approach to the study of gender socializations and gender roles. We will address issues of sex roles, the cultural construction of gender categories, the forms of gender inequality, and the ways cultures engage in gender based power relationships. While these issues will be dealt with in specific and local ethnographic contexts, students will be encouraged to make comparisons across the contexts and to compare these works with their own experience.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 217 Anthropology of Interfaith Relations 3.0 Credits
This course aims to introduce students to how anthropological and ethnographic analyses can help us understand the variety of ways in which people of different faiths both conflict with and work amicably together.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 220 Aging In Cross-Cultural Perspective 3.0 Credits
Examines the status, roles, and treatments of elderly people in various societies throughout the world and among minority groups in the United States.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 225 Anthropology of Youth 3.0 Credits
What is youth? Is it a universal, biological phase of human life somewhere between childhood and adulthood, or a cultural category, socially constructed and historically contingent? Does it mean the same thing to be young today in the US, Samoa, Indonesia, Nepal, or Japan, or do place, culture, history, media, and politics dramatically influence the feeling and experience of being young? This course addresses these and other questions raised by anthropologists about the culture and nature of "youth." We will be analyzing youth as an idea, an identity, a moral panic, a branding distinction, and an obsession.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 240 Urban Anthropology 3.0 Credits
This course will give students the opportunity to familiarize themselves with the major themes in urban anthropology and how they relate to other areas of research in anthropology and the social sciences in general. Students will focus on the research methods used by urban anthropologists as well as read different ethnographic cases of urban life.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 245 Reflecting on Work Identity 3.0 Credits
Reflecting on Work Identity is an online course developed for students to take during their first co-op cycle. The first phase of the course will focus on the "self"; the student will participate in self-categorization and evaluation of personal expectations in regard to their co-op and future professional life. The second phase will consist of an analysis of power dynamics at the workplace, focusing on the "other" rather than the "self." The final phase is a synthesis of the "self" and the "other," in which the student will combine knowledge acquired from the readings and personal experiences in order to address issues facing the modern workplace, as well as reflect on their individual work identity.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ANTH 250 Anthropology of Immigration 3.0 Credits
By examination of key ethnographical texts, the course covers basic
theoretical and topical approaches to the anthropology of immigration,
including: immigration and emigration; transnationalism and globalization;
reception contexts; ethnic economies, enclaves and ethnic businesses;
global economic strategies for migrant households; refugees, the state
and immigration; culture, identity, and adaptation and assimilation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 255 Psychological Anthropology 3.0 Credits
The course is an overview of the field of Psychological Anthropology.
It examines issues live nature vs. nurture; personality and "madness";
ethnopsychologies; and cognition. The attempt is to always recognize the
salience and significance of culture when considering these issues.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

**ANTH 265 Health & Healing Practices in Cross-Cultural Perspective
3.0 Credits**
This course examines the key concepts and research methodologies of
medical anthropology. It will explore the various metaphors about health,
and their meanings, that can be found across a range of cultural contexts.
Students will learn that the distinctive feature of the anthropological
approach to the study of health, disease and healthcare is the use of
ethnography.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 270 Comparative Religious Ethics 3.0 Credits
The eternal teaching of the different religions and how they address such
issues as war, sexuality and economics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

**ANTH 310 Societies In Transition: The Impact of Modernization and
the Third World 3.0 Credits**
Looks at the impact of 20th-century technology on traditional societies.
Uses area studies from Africa, Asia, and elsewhere to explore institutions
such as the family, the polity, the economy, and religion.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ANTH 312 Approaches to Intercultural Behavior 3.0 Credits
Examines theory and case studies related to working and living outside
the United States. Includes topics such as culture shock, cultural relativity,
and ethnocentrism. Selects specific geographic culture areas for case
studies.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 325 DIY Culture 3.0 Credits
Home-recorded albums, self-published books, personal style blogs, and
YouTube cat videos. These are just a small portion of the do-it-yourself
cultural products we encounter — and perhaps even make ourselves —
everyday. This course is a survey of DIY culture in the digital age, from
cutting and pasting, to photoshopping, digital video posting, and blogging.
Using critical theory, poststructuralist critique, and recent anthropological
work in the studies of media production, we will be analyzing the cultural,
historical, and political significance of DIY movements and cultures,
as well as assessing the theoretical frameworks put forward by social
theorists to make sense of them.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 330 Media Anthropology 3.0 Credits
This course will introduce students to the anthropological study of media
including traditional forms of mass media as well as new media such as
the Internet. Students will be exposed to the theories and methodologies
of media study from an anthropological perspective. Students will also
engage in their own ethnographic studies of media to gain first hand
experience with the methods of anthropology.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 335 Anthropology of Education 3.0 Credits
This course will look at key works of anthropologists as they look at
educational institutions from a cultural perspective. The course will
consider some of the more critical issues of the field, such as issues of
class, race and gender relations in schooling by focusing on some more
contemporary ethnographies.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 340 Crete Through The Looking Glass 3.0 Credits
Students are guided through the techniques of fieldwork and participant
observation to attend several customs and practices through various
fieldtrips. Traveling is a course requirement used toward the completion of
a research project. While "at home", students reflect on their experiences
through a looking-glass process.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ANTH 345 Visual Anthropology 3.0 Credits
Introduces students to the subdiscipline of visual anthropology through an
overview of visual theory and a survey of ethnographic photography and
film. Students will learn to evaluate ethnographic visual representation
as well as develop their own skills as visual anthropologists through
documenting and representing cultural phenomena.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ANTH 101 [Min Grade: D]

ANTH 350 Anthropology of Language 3.0 Credits
Explores how humans organize cultural activities though language and vice versa. After covering a short history of linguistic anthropological study and method, materials include ethnographic study of language and socialization, verbal art and linguistic performance, language and cultural categories, writing and literacy, and language ideologies.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 355 Digital Culture 3.0 Credits
This course will focus on how the internet, new and social media have changed the way we think about space and time. It will look at the ways we work and engage in leisure activities. We will bring the approach of anthropology to the study of these new media in order to ask key questions about social life.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 360 Culture and the Environment 3.0 Credits
This course explores the interplay between culture and the environment by examining both ethnographic accounts from around the world and archeological materials from the last 14,000 years. Special attention is paid to the changing cultural view of the environment over the last two centuries.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 363 Sacred Traditions of the East 3.0 Credits
This course introduces the student to sacred traditions of Asia: Hinduism, Buddhism and Confucianism. It will attempt a historical-comparative investigation of these traditions. It will emphasize the practice and philosophical underpinnings of these traditions, as well as the interplay between integration of the folk or popular aspects and the abstracts or esoteric.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 365 Family and Kinship 3.0 Credits
The course investigates the concepts of family and kinship from an anthropological perspective. It looks at the family as a critical and contradictory location at the intersection of global and transnational forces. Using anthropological concepts such as status and role, it will explore changing gender relationships, sexual expression, parenting and aging.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ANTH 370 Ethnographic Methods 3.0 Credits
The course introduces students to ethnographic research methods through eight hands-on assignments: 1) selecting a site; 2) establishing rapport; 3) operationalizing hypotheses; 4) using qualitative and quantitative data gathering techniques; 5) taking field notes ; 6) analyzing data collected; 7) synthesizing these data; and 8) writing an ethnographic report.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ANTH 375 Digital Ethnography 3.0 Credits
This course is the second part in the ethnographic methods series. It introduces students to the research methodologies employed by anthropologists to study online environments, digital communities, and virtual worlds. Students will gain practical, firsthand experience carrying out digital ethnographies and learn to evaluate the quality of digital ethnographic research.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 380 Special Topics in Anthropology 3.0 Credits
This course will explore current issues and debates in Anthropology. It will be conducted as a seminar. The topic will vary each term.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ANTH 385 Community Engaged Anthropology 3.0 Credits
Community engaged anthropology is a form of anthropology that employs participatory action research. As such, it is less research done on a community, as research done with the community as an equal partner. This course introduces students to that technic and approach, its philosophical underpinnings and principles. It is a writing intensive course involving the development and assessment of anthropological fieldnotes.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH 390 Seminar in Ethnography 2.0 Credits
The Seminar in Ethnography is a course for anthropology majors. This is a peer-mentoring practicum where students are given the opportunity to present their own ethnographic fieldwork and get feedback from other students in the seminar. All anthropology majors will be in the seminar together. Juniors and seniors will be presenting mature research as well as mentoring the freshmen and sophomores.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 8 credits
Restrictions: Can enroll if major is ANTH.

ANTH 410 Cultural Theory I 3.0 Credits
The course is the first of a two part core cultural theory sequence. It tracks the development of anthropological theory beginning in the mid-19th century until the 1980's. Students are expected to understand the foundational role played by cultural evolution, historical particularism, structural functionalism, structuralism and cultural ecology within the discipline.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ANTH 411 Cultural Theory II 3.0 Credits
This course is the second part of a two-part core in cultural theory that begins with Anthropology 410. It tracks the major theoretical streams of anthropological thought from the early 1980s to the present and challenges students to begin to place their own thinking within, and in opposition, to these streams of thought. Theoretical frameworks covered in this course include practice theory, post-structural theory, feminist theory, neo-Marxism, affect theory, and critiques of globalization and neoliberalism.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ANTH I199 Independent Study in ANTH 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ANTH I299 Independent Study in ANTH 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ANTH I399 Independent Study in ANTH 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ANTH I499 Independent Study in ANTH 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ANTH T180 Special Topics in Anthropology 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ANTH T280 Special Topics in Anthropology 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ANTH T380 Special Topics in Anthropology 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ANTH T480 Special Topics in Anthropology 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Arabic

Courses

ARBC 101 Arabic I 4.0 Credits
Introductory Arabic includes listening, speaking, reading and writing. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ARBC 102 Arabic II 4.0 Credits
Continues ARBC 101. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ARBC 101 [Min Grade: C]

ARBC 103 Arabic III 4.0 Credits
Continues ARBC 102. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ARBC 102 [Min Grade: C]

ARBC 201 Arabic IV 4.0 Credits
This course includes listening, speaking, reading, and writing practice, with a focus on cultural competency and conversational skills. Builds on Arabic 103.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ARBC 103 [Min Grade: C]

ARBC 202 Arabic V 4.0 Credits
This course includes listening, speaking, reading, and writing practice, with a focus on cultural competency and conversational skills. Builds on Arabic 201.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ARBC 201 [Min Grade: C]

ARBC 310 Advanced Writing and Speaking 4.0 Credits
Provides advanced practice in written and oral communication, including journalistic, professional and creative writing. Examines contemporary cultural contexts through media and news. Taught in Arabic.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ARBC 202 [Min Grade: C]

ARBC 320 Introduction to Language for the Professions 3.0 Credits
This course covers Introduction to Arabic communication skills in areas such as contemporary business, health, and law in a culturally sensitive fashion. The content of this course may change every term it is offered and is repeatable for credit. Taught in Arabic.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: ARBC 310 [Min Grade: C]

ARBC 410 Advanced Grammar and Translation 3.0 Credits
This course provides advanced grammar instruction and fosters translation and communication skills within a contemporary cultural context. The content of this course may change every term it is offered and is repeatable for credit. Taught in Arabic.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: ARBC 310 [Min Grade: C]

ARBC 411 Arabic - Introduction to Arabic Stylistics 3.0 Credits
Fourth year of Arabic -- provides advanced practice in translation, comprehension, and written and oral communication.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 24 credits
Prerequisites: ARBC 303 [Min Grade: C]

ARBC 420 Advanced Studies in Language for the Professions 3.0 Credits
This course provides advanced communication skills in areas such as contemporary business, health, and law in a culturally sensitive fashion. The content of this course may change every term it is offered and is repeatable for credit. Taught in Arabic.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: ARBC 310 [Min Grade: C]

ARBC 450 Advanced Studies in Language, Media, and Society 3.0 Credits
Advanced analysis of the role of language and media in society, including sociolinguistics, gender, media studies, and communication. Taught in Arabic.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: ARBC 310 [Min Grade: C]

ARBC 471 Arabic Civilization 3.0 Credits
ARBC 471 presents an integrated approach in Arabic to the civilization, culture, history, and literature specific to the areas in which the language is spoken, with emphasis on the development and evaluation of cultural values.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 24 credits
Prerequisites: ARBC 303 [Min Grade: C]

ARBC 480 Arabic Minor Thesis Course 0.5-4.0 Credits
Independent research study on a topic selected by the student. Independent study is supervised by a faculty member and guided by a plan of study. At the end of the course, the student is required to produce a paper and oral defense on the topic of his paper.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ARBC I199 Independent Study in ARBC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ARBC I299 Independent Study in ARBC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ARBC I399 Independent Study in ARBC 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ARBC I499 Independent Study in ARBC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ARBC T180 Special Topics in Arabic 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ARBC T280 Special Topics in Arabic 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ARBC T380 Special Topics in Arabic 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ARBC T480 Special Topics in Arabic 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Architectural Engineering

Courses

AE 220 Introduction to HVAC 3.5 Credits
This course includes a review of thermodynamics, moist air properties and processes, basic heat transfer, solar radiation, heating and cooling losses and load calculation, types of air conditioning systems, infiltration and ventilation, air motion and distribution.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (CAEE 202 [Min Grade: D] and CAEE 203 [Min Grade: D]) or ENGR 210 [Min Grade: D] or CHE 206 [Min Grade: D]

AE 340 Architectural Illumination and Electrical Systems 3.0 Credits
This course covers building electrical systems, including power demand, distribution and control; building illumination techniques, including lighting demand, layout and energy analysis.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (CAEE 202 [Min Grade: D] and PHYS 102 [Min Grade: D]) or ENGR 210 [Min Grade: D] or CHE 206 [Min Grade: D]

AE 390 Architectural Engineering Design I 4.0 Credits
Establishes a base of building systems design concepts, knowledge and performance criteria, with emphasis on the thermal, electrical, illumination and structural aspects of buildings.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: AE 220 [Min Grade: D] and AE 340 [Min Grade: D] and ARCH 192 [Min Grade: D] and MEM 202 [Min Grade: D]

AE 391 Architectural Engineering Design II 4.0 Credits
Emphasizes the development of insight into the solution of building system design problems, development of in-depth understanding of building systems design synthesis, and integration in a single building of modest scale and complexity.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: AE 390 [Min Grade: D]

AE 410 Intelligent Buildings 3.0 Credits
An overview of the present and future role of Information Technology in the construction industry with emphasis on the computer tools used throughout the building life cycle by all stakeholders, primarily Building Information Modeling (BIM) and the role of networked-linked sensors and actuators.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

AE 430 Control Systems for HVAC 3.0 Credits
This course introduces basic control concepts with applications to HVAC systems; direct digital control, control loops; system modeling; transfer functions; selecting and locating sensors and actuators; design and tuning control algorithms; design and programming of HVAC control systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: AE 220 [Min Grade: D] or MEM 413 [Min Grade: D]

AE I199 Independent Study in AE 0.0-12.0 Credits
Independent study on a topic selected by the student. Independent study is supervised by a faculty member and guided by a plan of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

AE I299 Independent Study in AE 0.0-12.0 Credits
Independent study on a topic selected by the student. Independent study is supervised by a faculty member and guided by a plan of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

AE I399 Independent Study in AE 0.0-12.0 Credits
Independent study on a topic selected by the student. Independent study is supervised by a faculty member and guided by a plan of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

AE I499 Independent Study in AE 0.0-12.0 Credits
Independent study on a topic selected by the student. Independent study is supervised by a faculty member and guided by a plan of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

AE T180 Special Topics in AE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

AE T280 Special Topics in AE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

AE T380 Special Topics in AE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

AE T480 Special Topics in AE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

Architecture

Courses

ARCH 107 Foundation Design I 2.0 Credits
Introduces basic design principles through investigation of abstract and applied design projects using two-dimensional media. Exercises heighten observation and graphic skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARCH 108 Foundation Design II 2.0 Credits
Investigates basic design principles through abstract and applied design projects in two-dimensional and three-dimensional media. Design exercises will advance understanding of the design process by exploring conceptual ideas through graphic and oral communication.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 107 [Min Grade: C]

ARCH 109 Foundation Design III 2.0 Credits
Investigates basic design principles that emphasize the inter-relationship between the scale of the human body and its movement within three-dimensional space. More in-depth design exercises will address the design process, development of a conceptual idea and a higher-level graphic and oral presentation.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 108 [Min Grade: C]

ARCH 141 Architecture and Society I 3.0 Credits
Examines the evolution of Western architectural thought, form, space, and structures in light of changing human values and institutions. Covers Western architecture from the prehistoric era through the Romanesque, and contemporary architecture in Asia and Central America as well as Islamic architecture in the Middle East and Spain.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARCH 142 Architecture and Society II 3.0 Credits
Examines the evolution of Western architectural thought, form, space and structures in light of changing human values and institutions. Course covers early monumental architecture of the Western Hemisphere and then considers the evolution of Western architecture from the "Dark Ages" through the development and spread of Renaissance architecture across Europe and Latin America.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 141 [Min Grade: C-]

ARCH 143 Architecture and Society III 3.0 Credits
Examines the evolution of Western architectural thought, form, space and structures in light of changing human values and institutions. Covers Western architecture and urbanism from the 16th C through the early 20th C. Also considered is the architecture of the Aztec and Inca empires, Islamic architecture and architecture and landscape designs of 16th C and 17th C Japan.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 142 [Min Grade: C-]

ARCH 144 Architecture and Society IV 3.0 Credits
Examines the evolution of architectural thought, form, space and structures in light of changing human values and institutions. Surveys the crucial buildings and thematic development of modern architecture and urbanism beginning in the late 19th C. through the mid-20th C.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-]

ARCH 170 Architectural Technology I 3.0 Credits
Introduction to the fundamental aspects of building technology with exposure to materials, structure and building systems that are frequently used in building construction. Provides a framework for the exploration of construction in the context of design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: PHYS 182 [Min Grade: C-] and (MATH 102 [Min Grade: C-] or MATH 183 [Min Grade: C-])

ARCH 172 Architectural Technology II 3.0 Credits
Further exploration of materials, structure and building systems and their influence on passive systems and sustainable design principles. Begins the development of systematic thinking regarding architectural technology.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 170 [Min Grade: C-]

ARCH 173 Architectural Technology III 3.0 Credits
Introduction to the technical building analysis including the organizing principles for materials, structure and systems. Includes envelope assembly, thermal comfort, structural and passive building systems.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 172 [Min Grade: C-]

ARCH 181 Architecture Studio 1A 4.0 Credits
Introduces basic architectural design principles. Elementary concepts of space, surface and form will be explored in two and three dimensional abstract exercises. Exercises incorporate observational analysis and graphic skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.

ARCH 182 Architecture Studio 1B 4.0 Credits
Transitions from abstract design principles to simple architectural exercises, considering function, scale, user and ordering strategies in relation to form-making in three-dimensional space. Exercises heighten observation and graphic skills while developing an architectural vocabulary.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 181 [Min Grade: C-]

ARCH 183 Architecture Studio 1C 4.0 Credits
Focuses on a series of basic architectural problems developed around issues of context and material use in relationship to the organization of space and human activity. Design exercises will cultivate the design process through developing a conceptual idea through graphic and oral communication.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 182 [Min Grade: C-] or INTR 233 [Min Grade: C-]

ARCH 191 Studio 1-AE 3.0 Credits
Architectural engineering majors only. Covers basic design principles using three-dimensional abstract and applied projects. Exercises heighten observation skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is AE.

ARCH 192 Studio 2-AE 3.0 Credits
Architectural engineering majors only. Continues ARCH 191. Uses design exercises to emphasize the nature of function, structure, and material and their impact on the design process.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is AE.
Prerequisites: ARCH 191 [Min Grade: D]

ARCH 211 Architectural Representation I 2.0 Credits
Introductory course that will provide a survey of drawing types with an emphasis on process and visual literacy.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.

ARCH 212 Architectural Representation II 2.0 Credits
Emphasis on craft and composition in the architectural representation of the built environment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 211 [Min Grade: C-]

ARCH 213 Architectural Representation III 2.0 Credits
Exploration of digital representation with an emphasis on making combining process drawing, digital fabrication and analog craft to develop three-dimensional representation skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 212 [Min Grade: C-]

ARCH 221 Materials & Methods I 1.5 Credit
Introduction to the fundamental aspects of building technology with exposure to materials and methods that are frequently used in building construction. Provides a framework for the exploration of construction in the context of design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 183 [Min Grade: C-]

ARCH 222 Materials & Methods II 1.5 Credit
Further exploration of materials, structure and building systems and their influence on passive systems and sustainable design principles. Begins the development of systematic thinking regarding architectural technology.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 221 [Min Grade: C-]

ARCH 223 Materials & Methods III 1.5 Credit
Introduction to technical building analysis including the organizing principles for materials, structure and systems. Includes envelope assembly, thermal comfort, structural and passive building systems.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 222 [Min Grade: C-]

ARCH 224 Architectural Representation IV 2.0 Credits
Emphasizes the communication of design through perspective, view-making and rendering. Through the use of digital and analog techniques, the ability to select the proper media to visually convey a design concept will be developed.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 213 [Min Grade: C-] and ARCH 183 [Min Grade: C-]

ARCH 225 Architectural Representation V 2.0 Credits
Emphasizes the tools to complete a final quality architectural presentation in a variety of venues including portfolios, digital representations and online media.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 224 [Min Grade: C-] and ARCH 281 [Min Grade: C-]

ARCH 226 Architectural Representation VI 2.0 Credits
Explores parametric thinking and the iterative design process while reinforcing critical skills in detailing and design development through various software programs.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 225 [Min Grade: C-] and ARCH 282 [Min Grade: C-]

ARCH 251 Structural Systems I 1.5 Credit
Introduction to the fundamental aspects of structural systems with exposure to materials and methods that are frequently used in building construction. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 183 [Min Grade: C-] and PHYS 182 [Min Grade: C-] and (MATH 102 [Min Grade: C-] or MATH 173 [Min Grade: C-] or MATH 183 [Min Grade: C-])

ARCH 252 Structural Systems II 1.5 Credit
Further introduction to the fundamental aspects of structural systems with exposure to materials and methods that are frequently used in building construction. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 251 [Min Grade: C-]

ARCH 253 Structural Systems III 1.5 Credit
Introduction and intermediate aspects of structural systems with exposure to materials and methods that are frequently used in building construction. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 252 [Min Grade: C-]

ARCH 261 Environmental Systems I 3.0 Credits
Introduces heating, ventilation, and air conditioning systems and site utility planning. Fall.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 104 [Min Grade: C-] or PHYS 184 [Min Grade: C-]

ARCH 262 Environmental Systems II 3.0 Credits
Introduces plumbing systems, including site distribution, water distribution, and waste systems. Fire protection is also covered. Winter.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 104 [Min Grade: C-] or PHYS 184 [Min Grade: C-]

ARCH 274 Architectural Technology IV 3.0 Credits
Intermediate development of architectural technology with a focus on application of analysis of primary materials, structure and systems. Depth and range of analytical tools are addressed.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 173 [Min Grade: C-] and PHYS 183 [Min Grade: C-]

ARCH 275 Architectural Technology V 3.0 Credits
Further development of analytical skills for building technology. Case studies and real world precedents examine materials, structure and systems in the support of larger architectural objectives.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 274 [Min Grade: C-]

ARCH 276 Architectural Technology VI 3.0 Credits
Examination of technical analysis and design in support of iterative architectural concepts. Materials, structure and systems are utilized to develop strong design synergies.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 275 [Min Grade: C-]

ARCH 281 Architecture Studio 2A 4.0 Credits
Introduces issues of architectural form, site and programmatic concerns. Design exercises will explore simple issues of structure, building and material systems and sustainability.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 183 [Min Grade: C-] and (ARCH 213 [Min Grade: C-] or INTR 245 [Min Grade: C-])

ARCH 282 Architecture Studio 2B 4.0 Credits
Covers architectural design problems of incremental complexity that emphasizes the nature of function, structure, and material and their impact on the design process.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ((ARCH 221 [Min Grade: C-] and ARCH 251 [Min Grade: C-]) or ARCH 170 [Min Grade: C-] or INTR 351 [Min Grade: C-],) and ARCH 281 [Min Grade: C-] and (ARCH 224 [Min Grade: C-] or INTR 341 [Min Grade: C-])

ARCH 283 Architecture Studio 2C 4.0 Credits
Explores architectural design problems that introduce the full range of challenges in the areas of organization, program, context, systems and formal expression.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ((ARCH 222 [Min Grade: C-] and ARCH 252 [Min Grade: C-]) or ARCH 170 [Min Grade: C-],) and ARCH 282 [Min Grade: C-] and ARCH 225 [Min Grade: C-]

ARCH 291 Building Systems I 1.5 Credit
Introduction to architectural technology with a focus on application of analysis pertaining to environmental systems within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 283 [Min Grade: C-] and PHYS 182 [Min Grade: C-] and (MATH 102 [Min Grade: C-] or MATH 173 [Min Grade: C-] or MATH 183 [Min Grade: C-])

ARCH 292 Building Systems II 1.5 Credit
Introduction to architectural technology with a focus on design impacts and analysis related to water within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 291 [Min Grade: C-]

ARCH 293 Building Systems III 1.5 Credit
Introduction to architectural technology with a focus on design impacts and analysis related to lighting within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 292 [Min Grade: C-]

ARCH 315 Sustainable Built Environment I 3.0 Credits
Provides an overview of contemporary sustainable design principles and systems involved to posit novel solutions to various design challenges. Combining theoretical knowledge, field trips and case studies enabling students to critically assess sustainability as it relates to the built environment through five key subsystems: materials, air, water, energy and life.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ARCH 320 Sustainable Built Environment II 3.0 Credits
Students will examine the work of scientists, designers, authors, artists, architects, engineers, planners, etc to gain a deeper conceptual understanding of current and emerging strategies in sustainability and the complex and integrated systems approach to the built environment in the present and near future.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ARCH 315 [Min Grade: C-]

ARCH 324 Materials & Methods IV 1.5 Credit
Advanced building technology concepts are explored through case studies and focused design examples. Materials, construction, methods, structure, systems and envelope are studied as integrated aspect of larger iterative design processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 173 [Min Grade: C-] or ARCH 223 [Min Grade: C-]

ARCH 325 Materials & Methods V 1.5 Credit
Further exploration of advanced building technology concepts through case studies and focused design examples. Materials, construction, methods, structure, systems and envelope are studied as integrated aspect of larger iterative design processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 324 [Min Grade: C-]

ARCH 326 Materials & Methods VI 1.5 Credit
Advanced integration of building technology concepts through design problems and examples. Materials, construction, methods, structure, systems and envelope are studied as integrated aspect of larger iterative design processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 325 [Min Grade: C-]

ARCH 335 Professional Practice I 3.0 Credits
This seminar is the first of a two-course sequence that introduces students to varying topics related to architectural practice in today's society. It addresses the following issues: Community and Social Responsibility, Leadership, Ethics & Professional Judgment, Client Role in Architecture, Basic Principles of Architectural Practice.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH or major is INTR.
Prerequisites: ARCH 243 [Min Grade: C-] or ARCH 383 [Min Grade: C-]

ARCH 336 Professional Practice II 3.0 Credits
This seminar is the second of a two-course sequence that introduces students to varying topics related to architectural practice in today's society. It addresses the following issues: Practice Management, Project Management, Financial Considerations, Legal Responsibilities, Ethics & Professional Judgment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH or major is INTR.
Prerequisites: ARCH 335 [Min Grade: C-]

ARCH 340 American Architecture & Urbanism 3.0 Credits
Surveys the development of American architecture and urbanism from its Native American origins through the arrival of early Modernism in the 1930s and 1940s. Writing Intensive.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 341 [WI] Theories of Architecture I 3.0 Credits
Seminar that examines theories and principles of Western architecture before 1700. History/theory elective. Fall. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 342 [WI] Theories of Architecture II 3.0 Credits
Continues ARCH 341. Seminar that examines theories and principles of Western architecture from the Baroque era of the 17th century to the beginning of Modernism in the 20th century. History/theory elective. Winter. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 343 Theories of Architecture III 3.0 Credits
Seminar that examines 20th-century theories of architecture, including analysis and discussion of current theoretical positions. History/theory elective. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 344 [WI] History of Modern Architecture I 3.0 Credits
Surveys the crucial buildings and thematic development of modern architecture and urbanism beginning in the late nineteenth Century continuing through the mid-20th Century. History/theory elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-]

ARCH 345 [WI] History of Modern Architecture II 3.0 Credits
Continuation of ARCH 344. Surveys the crucial buildings and thematic development of modern architecture and urbanism from the mid-20th Century to the present. History/theory elective. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-]

ARCH 346 [WI] History of Philadelphia Architecture 3.0 Credits
Covers the architecture of the city of Philadelphia from 1682, examining its architects, styles, and sources through lectures, walking tours, and student reports. History/theory elective. Fall. Alternate years. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 347 [WI] Intensive Architectural Studies 1.0-6.0 Credit
An intensive study tour of selected domestic and foreign destinations focusing on architecture and related design disciplines. Combines lecture, site visits, sketching and individual research. History/Theory Elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ARCH 143 [Min Grade: C-] or INTR 200 [Min Grade: C-] or ARTH 103 [Min Grade: C-]

ARCH 348 [WI] Studies in Vernacular Architecture 3.0 Credits
A topical survey of world traditions of vernacular architecture, with emphasis on houses and dwelling environments. The survey topics include basics of shelter, construction methods, response to climate, patterns of settlement, social and economic organization, cultural expression, and methods of research and analysis.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 350 Contemporary Architecture 3.0 Credits
Survey and analysis of significant developments in architecture and urbanism over the past 50+ years. Writing Intensive.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 354 Structural Systems IV 1.5 Credit
Intermediate aspects of structural systems with exposure to materials and methods that are frequently used in building construction. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 173 [Min Grade: C-] or ARCH 253 [Min Grade: C-]

ARCH 355 Structural Systems V 1.5 Credit
Intermediate structural analysis for architectural design. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 354 [Min Grade: C-]

ARCH 356 Structural Systems VI 1.5 Credit
Intermediate structural analysis for architectural design with a focus on composite systems. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 355 [Min Grade: C-]

ARCH 361 Studio 6-1 4.0 Credits
Introduces problems of urban design. Case studies demonstrate the relationship between the manmade environment and the natural environment as well as the relationship between many buildings and other manmade environments and the natural environment. Fall.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 353 [Min Grade: D] and ARCH 263 [Min Grade: C-]
Corequisite: ARCH 335

ARCH 362 Studio 6-2 4.0 Credits
Continues ARCH 361. A large urban-design project is undertaken to learn the design process required to solve problems of such magnitude. Winter.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 361 [Min Grade: D]
Corequisite: ARCH 336

ARCH 363 Studio 6-3 4.0 Credits
Continues ARCH 362. Requires students to develop architectural solutions for a portion of the problem addressed in Studio 6-2, demonstrating an understanding of the relationship between buildings and the exterior environment established in the previous course. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 362 [Min Grade: D]
Corequisite: PHIL 317

ARCH 377 Architectural Technology VII 3.0 Credits
Advanced building technology concepts are explored through case studies and focused design examples. Materials, construction, methods, structure, systems and envelope are studied as integrated aspect of larger iterative design processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 276 [Min Grade: C-]

ARCH 378 Architectural Technology VIII 3.0 Credits
Building technology and analysis are explored through design precedents and sketch problems to develop integrated design and analytical skills. Focuses on large and small scale elements that can become generative and performative aspects of major design decisions.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 377 [Min Grade: C-]

ARCH 379 Architectural Technology IX 3.0 Credits
Advanced building technology design and analysis is utilized in iterative and integrated design methods to support comprehensive design processes. Materials, structure and systems are developed qualitatively and quantitatively through design and analysis exercises.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 378 [Min Grade: C-]

ARCH 381 Architecture Studio 3A 4.0 Credits
Investigates the design relationship between man-made and the natural environment. Cultivates advanced analysis methods and the development of informed and resolved design solutions.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 283 [Min Grade: C-] and ARCH 226 [Min Grade: C-] and ARCH 173 [Min Grade: C-] or (ARCH 223 [Min Grade: C-] and ARCH 253 [Min Grade: C-])

ARCH 382 Architecture Studio 3B 4.0 Credits
Studies the relationship between building, site and context. Architectural design problems emphasize concept development that translates careful analysis into the building ideas with a progressing understanding of architectural concerns.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 381 [Min Grade: C-] and ARCH 274 [Min Grade: C-] or (ARCH 291 [Min Grade: C-] and ARCH 354 [Min Grade: C-])

ARCH 383 Architecture Studio 3C 4.0 Credits
Focuses on architectural problems with intermediate complexity. Integrates issues of context, site, program, function, and architectural systems into advanced design proposals.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 382 [Min Grade: C-] and ARCH 275 [Min Grade: C-] or (ARCH 292 [Min Grade: C-] and ARCH 355 [Min Grade: C-])

ARCH 394 Building Systems IV 1.5 Credit
Intermediate study of architectural technology with a focus on design impacts and analysis related to mechanical systems within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 276 [Min Grade: C-] or ARCH 293 [Min Grade: C-]

ARCH 395 Building Systems V 1.5 Credit
Intermediate study of architectural technology with a focus on design impacts and analysis related to acoustical design and energy consumption within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 394 [Min Grade: C-]

ARCH 396 Building Systems VI 1.5 Credit
Intermediate study of architectural technology with a focus on design impacts and analysis related to lighting and electrical systems within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 395 [Min Grade: C-]

ARCH 421 [WI] Environmental Psychology and Design Theory 3.0 Credits
Examines the relationship between human behavior and architecture from the perspective of environmental psychology. Topics include aesthetics, environmental experience, social interaction, social organization, and culture. This is a writing intensive course. History/Theory Elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 431 [WI] Architectural Programming 3.0 Credits
Introduces current techniques of building programming and their relationship to building design. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 353 [Min Grade: C-] or ARCH 483 [Min Grade: C-]

ARCH 432 The Development Process 3.0 Credits
Introduces the process of land development. Explores traditional and emerging development models (the architect as the equity participant and developer) in relation to new construction and rehabilitation. Covers various methods of initiating building projects and financing and tax issues. Professional elective. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARCH 441 Urban Design Seminar 3.0 Credits
Expands the concept of architecture to urban design scale and presents the principles of city planning through a series of case studies. History/Theory Elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 451 Advanced Drawing 3.0 Credits
Covers advanced architectural rendering, concentrating on the effects of light, shade, and color using the techniques of water-color rendering. Professional elective. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 226 [Min Grade: C-] or INTR 341 [Min Grade: C-]

ARCH 455 Computer Applications in Architecture I 3.0 Credits
Covers two-dimensional and three-dimensional computer representations and applications. Professional elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 226 [Min Grade: C-]

ARCH 456 Computer Applications in Architecture II 3.0 Credits
Further investigates and demonstrates the computer's capabilities in architectural design and representation. Professional elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 226 [Min Grade: C-]

ARCH 463 Emerging Architectural Technology 3.0 Credits
A holistic study of design and construction technology of significant buildings by leading architects.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 161 [Min Grade: C-] or ARCH 173 [Min Grade: C-] or ARCH 253 [Min Grade: C-]

ARCH 464 Building Enclosure Design 3.0 Credits
Examines the integrations of aesthetics, building science, and technology in the design of building enclosures. Professional Elective. Summer.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: or ARCH 173 [Min Grade: C-] or ARCH 253 [Min Grade: C-]

ARCH 465 Energy and Architecture 3.0 Credits
Creates an awareness of the availability of energy resources and their effect on the built environment. Discusses alternative sources of energy. Professional elective. Summer.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 173 [Min Grade: C-] or ARCH 253 [Min Grade: C-]

ARCH 481 Architecture Studio 4A 4.0 Credits
Focuses on more complex architectural challenges through analysis of case studies that address the relationship between the man-made built environment and the natural environment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 383 [Min Grade: C-] and ARCH 276 [Min Grade: C-] or (ARCH 356 [Min Grade: C-] and ARCH 293 [Min Grade: C-])

ARCH 482 Architecture Studio 4B 4.0 Credits
Furthers the understanding of context and design and the application of solutions and strategies surrounding more complex architectural and environmental problems.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 481 [Min Grade: C-] and ARCH 377 [Min Grade: C-] or (ARCH 324 [Min Grade: C-] and ARCH 394 [Min Grade: C-])

ARCH 483 Architecture Studio 4C 4.0 Credits
Challenges to develop and refine architectural solutions through an advanced understanding of the relationship between buildings and environment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 482 [Min Grade: C-] and ARCH 378 [Min Grade: C-] or (ARCH 325 [Min Grade: C-] and ARCH 395 [Min Grade: C-])

ARCH 487 Architecture Studio 5A 4.0 Credits
Addresses the complex relationship through analysis and synthesis of form, site, program, building technology and theory within specific building context.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 483 [Min Grade: C-] and ARCH 379 [Min Grade: C-] or (ARCH 326 [Min Grade: C-] and ARCH 356 [Min Grade: C-] and ARCH 396 [Min Grade: C-])

ARCH 488 Architecture Studio 5B 4.0 Credits
Emphasizes complex architectural problems while demonstrating understanding and appropriate application.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 487 [Min Grade: C-]

ARCH 489 Architecture Studio 5C 4.0 Credits
Integrates in-depth application and coordination of all architectural building criteria in a large scale and complex architectural problem.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 488 [Min Grade: C-]

ARCH 493 Senior Project I 4.0 Credits
Students develop a three-term capstone design project to pursue and explore architectural concepts in depth. Students take a project from concept, research, programming to complete design development. Part one of three.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: (ARCH 363 [Min Grade: C-] or ARCH 489 [Min Grade: C-]) and ARCH 431 [Min Grade: C-]

ARCH 494 Senior Project II 4.0 Credits
Students develop a three-term capstone design project to pursue and explore architectural concepts in depth. Students take a project from concept, research, programming to complete design development. Part two of three.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 493 [Min Grade: C-]

ARCH 495 Senior Project III 4.0 Credits
Students develop a three-term capstone design project to pursue and explore architectural concepts in depth. Students take a project from concept, research, programming to complete design development. Part three of three.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 494 [Min Grade: C-]

ARCH 496 Thesis I 8.0 Credits
An individually structured year-long design problem that enables students to work independently and explore complex issues in depth. Periodic individual review sessions are scheduled with faculty adviser. Fall.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 363 [Min Grade: D] and ARCH 143 [Min Grade: C-] and (ARCH 134 [Min Grade: C-] or ARCH 153 [Min Grade: C-] or ARCH 226 [Min Grade: C-]) and (ARCH 263 [Min Grade: C-] and ARCH 273 [Min Grade: C-]) or ARCH 379 [Min Grade: C-]

ARCH 497 Thesis II 8.0 Credits
Continues ARCH 496. Winter.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 496 [Min Grade: C-]

ARCH 498 Thesis III 8.0 Credits
Continues ARCH 497. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 497 [Min Grade: C-]

ARCH I199 Independent Study in Architecture 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH I299 Independent Study in Architecture 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH I399 Independent Study in Architecture 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH I499 Independent Study in Architecture 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ARCH 143 [Min Grade: C]

ARCH T180 Special Topics in Architecture 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH T280 Special Topics in Architecture 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH T380 Special Topics in Architecture 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH T480 Special Topics in Architecture 1.0-6.0 Credit
Covers special topics in architectural history, theory, or technology that
satisfy history/theory or professional elective requirements.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ARCH 143 [Min Grade: C]

Courses

ARCH 107 Foundation Design I 2.0 Credits
Introduces basic design principles through investigation of abstract and
applied design projects using two-dimensional media. Exercises heighten
observation and graphic skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARCH 108 Foundation Design II 2.0 Credits
Investigates basic design principles through abstract and applied design
projects in two-dimensional and three-dimensional media. Design
exercises will advance understanding of the design process by exploring
conceptual ideas through graphic and oral communication.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 107 [Min Grade: C]

ARCH 109 Foundation Design III 2.0 Credits
Investigates basic design principles that emphasize the inter-relationship
between the scale of the human body and its movement within three-
dimensional space. More in-depth design exercises will address the
design process, development of a conceptual idea and a higher-level
graphic and oral presentation.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 108 [Min Grade: C]

ARCH 141 Architecture and Society I 3.0 Credits
Examines the evolution of Western architectural thought, form, space,
and structures in light of changing human values and institutions. Covers
Western architecture from the prehistoric era through the Romanesque,
and contemporary architecture in Asia and Central America as well as
Islamic architecture in the Middle East and Spain.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARCH 142 Architecture and Society II 3.0 Credits
Examines the evolution of Western architectural thought, form, space
and structures in light of changing human values and institutions. Course
covers early monumental architecture of the Western Hemisphere and
then considers the evolution of Western architecture from the "Dark Ages"
through the development and spread of Renaissance architecture across
Europe and Latin America.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 141 [Min Grade: C-]

ARCH 143 Architecture and Society III 3.0 Credits
Examines the evolution of Western architectural thought, form, space
and structures in light of changing human values and institutions. Covers
Western architecture and urbanism from the 16th C through the early
20th C. Also considered is the architecture of the Aztec and Inca empires,
Islamic architecture and architecture and landscape designs of 16th C and
17th C Japan.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 142 [Min Grade: C-]

ARCH 144 Architecture and Society IV 3.0 Credits
Examines the evolution of architectural thought, form, space and
structures in light of changing human values and institutions. Surveys the
crucial buildings and thematic development of modern architecture and
urbanism beginning in the late 19th C. through the mid-20th C.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-]

ARCH 170 Architectural Technology I 3.0 Credits
Introduction to the fundamental aspects of building technology with
exposure to materials, structure and building systems that are frequently
used in building construction. Provides a framework for the exploration of
construction in the context of design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: PHYS 182 [Min Grade: C-] and (MATH 102 [Min Grade:
C-] or MATH 183 [Min Grade: C-])

ARCH 172 Architectural Technology II 3.0 Credits
Further exploration of materials, structure and building systems and their
influence on passive systems and sustainable design principles. Begins
the development of systematic thinking regarding architectural technology.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 170 [Min Grade: C-]

ARCH 173 Architectural Technology III 3.0 Credits
Introduction to the technical building analysis including the organizing
principles for materials, structure and systems. Includes envelope
assembly, thermal comfort, structural and passive building systems.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 172 [Min Grade: C-]

ARCH 181 Architecture Studio 1A 4.0 Credits
Introduces basic architectural design principles. Elementary concepts of
space, surface and form will be explored in two and three dimensional
abstract exercises. Exercises incorporate observational analysis and
graphic skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.

ARCH 182 Architecture Studio 1B 4.0 Credits
Transitions from abstract design principles to simple architectural
exercises, considering function, scale, user and ordering strategies
in relation to form-making in three-dimensional space. Exercises
heighten observation and graphic skills while developing an architectural
vocabulary.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 181 [Min Grade: C-]

ARCH 183 Architecture Studio 1C 4.0 Credits
Focuses on a series of basic architectural problems developed around
issues of context and material use in relationship to the organization
of space and human activity. Design exercises will cultivate the design
process through developing a conceptual idea through graphic and oral
communication.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 182 [Min Grade: C-] or INTR 233 [Min Grade: C-]

ARCH 191 Studio 1-AE 3.0 Credits
Architectural engineering majors only. Covers basic design principles
using three-dimensional abstract and applied projects. Exercises heighten
observation skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is AE.

ARCH 192 Studio 2-AE 3.0 Credits
Architectural engineering majors only. Continues ARCH 191. Uses design
exercises to emphasize the nature of function, structure, and material and
their impact on the design process.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is AE.
Prerequisites: ARCH 191 [Min Grade: D]

ARCH 211 Architectural Representation I 2.0 Credits
Introductory course that will provide a survey of drawing types with an
emphasis on process and visual literacy.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.

ARCH 212 Architectural Representation II 2.0 Credits
Emphasis on craft and composition in the architectural representation of
the built environment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 211 [Min Grade: C-]

ARCH 213 Architectural Representation III 2.0 Credits
Exploration of digital representation with an emphasis on making
combining process drawing, digital fabrication and analog craft to develop
three-dimensional representation skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 212 [Min Grade: C-]

ARCH 221 Materials & Methods I 1.5 Credit
Introduction to the fundamental aspects of building technology with
exposure to materials and methods that are frequently used in building
construction. Provides a framework for the exploration of construction in
the context of design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 183 [Min Grade: C-]

ARCH 222 Materials & Methods II 1.5 Credit
Further exploration of materials, structure and building systems and their influence on passive systems and sustainable design principles. Begins the development of systematic thinking regarding architectural technology.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 221 [Min Grade: C-]

ARCH 223 Materials & Methods III 1.5 Credit
Introduction to technical building analysis including the organizing principles for materials, structure and systems. Includes envelope assembly, thermal comfort, structural and passive building systems.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 222 [Min Grade: C-]

ARCH 224 Architectural Representation IV 2.0 Credits
Emphasizes the communication of design through perspective, view-making and rendering. Through the use of digital and analog techniques, the ability to select the proper media to visually convey a design concept will be developed.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 213 [Min Grade: C-] and ARCH 183 [Min Grade: C-]

ARCH 225 Architectural Representation V 2.0 Credits
Emphasizes the tools to complete a final quality architectural presentation in a variety of venues including portfolios, digital representations and online media.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 224 [Min Grade: C-] and ARCH 281 [Min Grade: C-]

ARCH 226 Architectural Representation VI 2.0 Credits
Explores parametric thinking and the iterative design process while reinforcing critical skills in detailing and design development through various software programs.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 225 [Min Grade: C-] and ARCH 282 [Min Grade: C-]

ARCH 251 Structural Systems I 1.5 Credit
Introduction to the fundamental aspects of structural systems with exposure to materials and methods that are frequently used in building construction. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 183 [Min Grade: C-] and PHYS 182 [Min Grade: C-] and (MATH 102 [Min Grade: C-] or MATH 173 [Min Grade: C-] or MATH 183 [Min Grade: C-])

ARCH 252 Structural Systems II 1.5 Credit
Further introduction to the fundamental aspects of structural systems with exposure to materials and methods that are frequently used in building construction. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 251 [Min Grade: C-]

ARCH 253 Structural Systems III 1.5 Credit
Introduction and intermediate aspects of structural systems with exposure to materials and methods that are frequently used in building construction. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 252 [Min Grade: C-]

ARCH 261 Environmental Systems I 3.0 Credits
Introduces heating, ventilation, and air conditioning systems and site utility planning. Fall.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 104 [Min Grade: C-] or PHYS 184 [Min Grade: C-]

ARCH 262 Environmental Systems II 3.0 Credits
Introduces plumbing systems, including site distribution, water distribution, and waste systems. Fire protection is also covered. Winter.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 104 [Min Grade: C-] or PHYS 184 [Min Grade: C-]

ARCH 274 Architectural Technology IV 3.0 Credits
Intermediate development of architectural technology with a focus on application of analysis of primary materials, structure and systems. Depth and range of analytical tools are addressed.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 173 [Min Grade: C-] and PHYS 183 [Min Grade: C-]

ARCH 275 Architectural Technology V 3.0 Credits
Further development of analytical skills for building technology. Case studies and real world precedents examine materials, structure and systems in the support of larger architectural objectives.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 274 [Min Grade: C-]

ARCH 276 Architectural Technology VI 3.0 Credits
Examination of technical analysis and design in support of iterative architectural concepts. Materials, structure and systems are utilized to develop strong design synergies.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 275 [Min Grade: C-]

ARCH 281 Architecture Studio 2A 4.0 Credits
Introduces issues of architectural form, site and programmatic concerns. Design exercises will explore simple issues of structure, building and material systems and sustainability.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 183 [Min Grade: C-] and (ARCH 213 [Min Grade: C-] or INTR 245 [Min Grade: C-])

ARCH 282 Architecture Studio 2B 4.0 Credits
Covers architectural design problems of incremental complexity that emphasizes the nature of function, structure, and material and their impact on the design process.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ((ARCH 221 [Min Grade: C-] and ARCH 251 [Min Grade: C-]) or ARCH 170 [Min Grade: C-] or INTR 351 [Min Grade: C-],) and ARCH 281 [Min Grade: C-] and (ARCH 224 [Min Grade: C-] or INTR 341 [Min Grade: C-])

ARCH 283 Architecture Studio 2C 4.0 Credits
Explores architectural design problems that introduce the full range of challenges in the areas of organization, program, context, systems and formal expression.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ((ARCH 222 [Min Grade: C-] and ARCH 252 [Min Grade: C-]) or ARCH 170 [Min Grade: C-],) and ARCH 282 [Min Grade: C-] and ARCH 225 [Min Grade: C-]

ARCH 291 Building Systems I 1.5 Credit
Introduction to architectural technology with a focus on application of analysis pertaining to environmental systems within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 283 [Min Grade: C-] and PHYS 182 [Min Grade: C-] and (MATH 102 [Min Grade: C-] or MATH 173 [Min Grade: C-] or MATH 183 [Min Grade: C-])

ARCH 292 Building Systems II 1.5 Credit
Introduction to architectural technology with a focus on design impacts and analysis related to water within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 291 [Min Grade: C-]

ARCH 293 Building Systems III 1.5 Credit
Introduction to architectural technology with a focus on design impacts and analysis related to lighting within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 292 [Min Grade: C-]

ARCH 315 Sustainable Built Environment I 3.0 Credits
Provides an overview of contemporary sustainable design principles and systems involved to posit novel solutions to various design challenges. Combining theoretical knowledge, field trips and case studies enabling students to critically assess sustainability as it relates to the built environment through five key subsystems: materials, air, water, energy and life.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ARCH 320 Sustainable Built Environment II 3.0 Credits
Students will examine the work of scientists, designers, authors, artists, architects, engineers, planners, etc to gain a deeper conceptual understanding of current and emerging strategies in sustainability and the complex and integrated systems approach to the built environment in the present and near future.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ARCH 315 [Min Grade: C-]

ARCH 324 Materials & Methods IV 1.5 Credit
Advanced building technology concepts are explored through case studies and focused design examples. Materials, construction, methods, structure, systems and envelope are studied as integrated aspect of larger iterative design processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 173 [Min Grade: C-] or ARCH 223 [Min Grade: C-]

ARCH 325 Materials & Methods V 1.5 Credit
Further exploration of advanced building technology concepts through case studies and focused design examples. Materials, construction, methods, structure, systems and envelope are studied as integrated aspect of larger iterative design processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 324 [Min Grade: C-]

ARCH 326 Materials & Methods VI 1.5 Credit
Advanced integration of building technology concepts through design problems and examples. Materials, construction, methods, structure, systems and envelope are studied as integrated aspect of larger iterative design processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 325 [Min Grade: C-]

ARCH 335 Professional Practice I 3.0 Credits
This seminar is the first of a two-course sequence that introduces students to varying topics related to architectural practice in today's society. It addresses the following issues: Community and Social Responsibility, Leadership, Ethics & Professional Judgment, Client Role in Architecture, Basic Principles of Architectural Practice.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH or major is INTR.
Prerequisites: ARCH 243 [Min Grade: C-] or ARCH 383 [Min Grade: C-]

ARCH 336 Professional Practice II 3.0 Credits
This seminar is the second of a two-course sequence that introduces students to varying topics related to architectural practice in today's society. It addresses the following issues: Practice Management, Project Management, Financial Considerations, Legal Responsibilities, Ethics & Professional Judgment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH or major is INTR.
Prerequisites: ARCH 335 [Min Grade: C-]

ARCH 340 American Architecture & Urbanism 3.0 Credits
Surveys the development of American architecture and urbanism from its Native American origins through the arrival of early Modernism in the 1930s and 1940s. Writing Intensive.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 341 [WI] Theories of Architecture I 3.0 Credits
Seminar that examines theories and principles of Western architecture before 1700. History/theory elective. Fall. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 342 [WI] Theories of Architecture II 3.0 Credits
Continues ARCH 341. Seminar that examines theories and principles of Western architecture from the Baroque era of the 17th century to the beginning of Modernism in the 20th century. History/theory elective. Winter. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 343 Theories of Architecture III 3.0 Credits
Seminar that examines 20th-century theories of architecture, including analysis and discussion of current theoretical positions. History/theory elective. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 344 [WI] History of Modern Architecture I 3.0 Credits
Surveys the crucial buildings and thematic development of modern architecture and urbanism beginning in the late nineteenth Century continuing through the mid-20th Century. History/theory elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-]

ARCH 345 [WI] History of Modern Architecture II 3.0 Credits
Continuation of ARCH 344. Surveys the crucial buildings and thematic development of modern architecture and urbanism from the mid-20th Century to the present. History/theory elective. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-]

ARCH 346 [WI] History of Philadelphia Architecture 3.0 Credits
Covers the architecture of the city of Philadelphia from 1682, examining its architects, styles, and sources through lectures, walking tours, and student reports. History/theory elective. Fall. Alternate years. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 347 [WI] Intensive Architectural Studies 1.0-6.0 Credit
An intensive study tour of selected domestic and foreign destinations focusing on architecture and related design disciplines. Combines lecture, site visits, sketching and individual research. History/Theory Elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ARCH 143 [Min Grade: C-] or INTR 200 [Min Grade: C-] or ARTH 103 [Min Grade: C-]

ARCH 348 [WI] Studies in Vernacular Architecture 3.0 Credits
A topical survey of world traditions of vernacular architecture, with emphasis on houses and dwelling environments. The survey topics include basics of shelter, construction methods, response to climate, patterns of settlement, social and economic organization, cultural expression, and methods of research and analysis.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 350 Contemporary Architecture 3.0 Credits
Survey and analysis of significant developments in architecture and urbanism over the past 50+ years. Writing Intensive.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 354 Structural Systems IV 1.5 Credit
Intermediate aspects of structural systems with exposure to materials and methods that are frequently used in building construction. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 173 [Min Grade: C-] or ARCH 253 [Min Grade: C-]

ARCH 355 Structural Systems V 1.5 Credit
Intermediate structural analysis for architectural design. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 354 [Min Grade: C-]

ARCH 356 Structural Systems VI 1.5 Credit
Intermediate structural analysis for architectural design with a focus on composite systems. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 355 [Min Grade: C-]

ARCH 361 Studio 6-1 4.0 Credits
Introduces problems of urban design. Case studies demonstrate the relationship between the manmade environment and the natural environment as well as the relationship between many buildings and other manmade environments and the natural environment. Fall.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 353 [Min Grade: D] and ARCH 263 [Min Grade: C-]
Corequisite: ARCH 335

ARCH 362 Studio 6-2 4.0 Credits
Continues ARCH 361. A large urban-design project is undertaken to learn the design process required to solve problems of such magnitude. Winter.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 361 [Min Grade: D]
Corequisite: ARCH 336

ARCH 363 Studio 6-3 4.0 Credits
Continues ARCH 362. Requires students to develop architectural solutions for a portion of the problem addressed in Studio 6-2, demonstrating an understanding of the relationship between buildings and the exterior environment established in the previous course. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 362 [Min Grade: D]
Corequisite: PHIL 317

ARCH 377 Architectural Technology VII 3.0 Credits
Advanced building technology concepts are explored through case studies and focused design examples. Materials, construction, methods, structure, systems and envelope are studied as integrated aspect of larger iterative design processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 276 [Min Grade: C-]

ARCH 378 Architectural Technology VIII 3.0 Credits
Building technology and analysis are explored through design precedents and sketch problems to develop integrated design and analytical skills. Focuses on large and small scale elements that can become generative and performative aspects of major design decisions.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 377 [Min Grade: C-]

ARCH 379 Architectural Technology IX 3.0 Credits
Advanced building technology design and analysis is utilized in iterative and integrated design methods to support comprehensive design processes. Materials, structure and systems are developed qualitatively and quantitatively through design and analysis exercises.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 378 [Min Grade: C-]

ARCH 381 Architecture Studio 3A 4.0 Credits
Investigates the design relationship between man-made and the natural environment. Cultivates advanced analysis methods and the development of informed and resolved design solutions.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 283 [Min Grade: C-] and ARCH 226 [Min Grade: C-] and ARCH 173 [Min Grade: C-] or (ARCH 223 [Min Grade: C-] and ARCH 253 [Min Grade: C-])

ARCH 382 Architecture Studio 3B 4.0 Credits
Studies the relationship between building, site and context. Architectural design problems emphasize concept development that translates careful analysis into the building ideas with a progressing understanding of architectural concerns.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 381 [Min Grade: C-] and ARCH 274 [Min Grade: C-] or (ARCH 291 [Min Grade: C-] and ARCH 354 [Min Grade: C-])

ARCH 383 Architecture Studio 3C 4.0 Credits
Focuses on architectural problems with intermediate complexity. Integrates issues of context, site, program, function, and architectural systems into advanced design proposals.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 382 [Min Grade: C-] and ARCH 275 [Min Grade: C-] or (ARCH 292 [Min Grade: C-] and ARCH 355 [Min Grade: C-])

ARCH 394 Building Systems IV 1.5 Credit
Intermediate study of architectural technology with a focus on design impacts and analysis related to mechanical systems within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 276 [Min Grade: C-] or ARCH 293 [Min Grade: C-]

ARCH 395 Building Systems V 1.5 Credit
Intermediate study of architectural technology with a focus on design impacts and analysis related to acoustical design and energy consumption within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 394 [Min Grade: C-]

ARCH 396 Building Systems VI 1.5 Credit
Intermediate study of architectural technology with a focus on design impacts and analysis related to lighting and electrical systems within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 395 [Min Grade: C-]

ARCH 421 [WI] Environmental Psychology and Design Theory 3.0 Credits
Examines the relationship between human behavior and architecture from the perspective of environmental psychology. Topics include aesthetics, environmental experience, social interaction, social organization, and culture. This is a writing intensive course. History/Theory Elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 431 [WI] Architectural Programming 3.0 Credits
Introduces current techniques of building programming and their relationship to building design. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 353 [Min Grade: C-] or ARCH 483 [Min Grade: C-]

ARCH 432 The Development Process 3.0 Credits
Introduces the process of land development. Explores traditional and emerging development models (the architect as the equity participant and developer) in relation to new construction and rehabilitation. Covers various methods of initiating building projects and financing and tax issues. Professional elective. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARCH 441 Urban Design Seminar 3.0 Credits
Expands the concept of architecture to urban design scale and presents the principles of city planning through a series of case studies. History/Theory Elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 451 Advanced Drawing 3.0 Credits
Covers advanced architectural rendering, concentrating on the effects of light, shade, and color using the techniques of water-color rendering. Professional elective. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 226 [Min Grade: C-] or INTR 341 [Min Grade: C-]

ARCH 455 Computer Applications in Architecture I 3.0 Credits
Covers two-dimensional and three-dimensional computer representations and applications. Professional elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 226 [Min Grade: C-]

ARCH 456 Computer Applications in Architecture II 3.0 Credits
Further investigates and demonstrates the computer's capabilities in architectural design and representation. Professional elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 226 [Min Grade: C-]

ARCH 463 Emerging Architectural Technology 3.0 Credits
A holistic study of design and construction technology of significant buildings by leading architects.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 161 [Min Grade: C-] or ARCH 173 [Min Grade: C-] or ARCH 253 [Min Grade: C-]

ARCH 464 Building Enclosure Design 3.0 Credits
Examines the integrations of aesthetics, building science, and technology in the design of building enclosures. Professional Elective. Summer.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: or ARCH 173 [Min Grade: C-] or ARCH 253 [Min Grade: C-]

ARCH 465 Energy and Architecture 3.0 Credits
Creates an awareness of the availability of energy resources and their effect on the built environment. Discusses alternative sources of energy. Professional elective. Summer.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 173 [Min Grade: C-] or ARCH 253 [Min Grade: C-]

ARCH 481 Architecture Studio 4A 4.0 Credits
Focuses on more complex architectural challenges through analysis of case studies that address the relationship between the man-made built environment and the natural environment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 383 [Min Grade: C-] and ARCH 276 [Min Grade: C-] or (ARCH 356 [Min Grade: C-] and ARCH 293 [Min Grade: C-])

ARCH 482 Architecture Studio 4B 4.0 Credits
Furthers the understanding of context and design and the application of solutions and strategies surrounding more complex architectural and environmental problems.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 481 [Min Grade: C-] and ARCH 377 [Min Grade: C-] or (ARCH 324 [Min Grade: C-] and ARCH 394 [Min Grade: C-])

ARCH 483 Architecture Studio 4C 4.0 Credits
Challenges to develop and refine architectural solutions through an advanced understanding of the relationship between buildings and environment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 482 [Min Grade: C-] and ARCH 378 [Min Grade: C-] or (ARCH 325 [Min Grade: C-] and ARCH 395 [Min Grade: C-])

ARCH 487 Architecture Studio 5A 4.0 Credits
Addresses the complex relationship through analysis and synthesis of form, site, program, building technology and theory within specific building context.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 483 [Min Grade: C-] and ARCH 379 [Min Grade: C-] or (ARCH 326 [Min Grade: C-] and ARCH 356 [Min Grade: C-] and ARCH 396 [Min Grade: C-])

ARCH 488 Architecture Studio 5B 4.0 Credits
Emphasizes complex architectural problems while demonstrating understanding and appropriate application.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 487 [Min Grade: C-]

ARCH 489 Architecture Studio 5C 4.0 Credits
Integrates in-depth application and coordination of all architectural building criteria in a large scale and complex architectural problem.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 488 [Min Grade: C-]

ARCH 493 Senior Project I 4.0 Credits
Students develop a three-term capstone design project to pursue and explore architectural concepts in depth. Students take a project from concept, research, programming to complete design development. Part one of three.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: (ARCH 363 [Min Grade: C-] or ARCH 489 [Min Grade: C-]) and ARCH 431 [Min Grade: C-]

ARCH 494 Senior Project II 4.0 Credits
Students develop a three-term capstone design project to pursue and explore architectural concepts in depth. Students take a project from concept, research, programming to complete design development. Part two of three.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 493 [Min Grade: C-]

ARCH 495 Senior Project III 4.0 Credits
Students develop a three-term capstone design project to pursue and explore architectural concepts in depth. Students take a project from concept, research, programming to complete design development. Part three of three.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 494 [Min Grade: C-]

ARCH 496 Thesis I 8.0 Credits
An individually structured year-long design problem that enables students to work independently and explore complex issues in depth. Periodic individual review sessions are scheduled with faculty adviser. Fall.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 363 [Min Grade: D] and ARCH 143 [Min Grade: C-] and (ARCH 134 [Min Grade: C-] or ARCH 153 [Min Grade: C-] or ARCH 226 [Min Grade: C-]) and (ARCH 263 [Min Grade: C-] and ARCH 273 [Min Grade: C-]) or ARCH 379 [Min Grade: C-]

ARCH 497 Thesis II 8.0 Credits
Continues ARCH 496. Winter.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 496 [Min Grade: C-]

ARCH 498 Thesis III 8.0 Credits
Continues ARCH 497. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 497 [Min Grade: C-]

ARCH I199 Independent Study in Architecture 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH I299 Independent Study in Architecture 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH I399 Independent Study in Architecture 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH I499 Independent Study in Architecture 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ARCH 143 [Min Grade: C]

ARCH T180 Special Topics in Architecture 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH T280 Special Topics in Architecture 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH T380 Special Topics in Architecture 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH T480 Special Topics in Architecture 1.0-6.0 Credit
Covers special topics in architectural history, theory, or technology that
satisfy history/theory or professional elective requirements.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ARCH 143 [Min Grade: C]

Courses

ARCH 107 Foundation Design I 2.0 Credits
Introduces basic design principles through investigation of abstract and
applied design projects using two-dimensional media. Exercises heighten
observation and graphic skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARCH 108 Foundation Design II 2.0 Credits
Investigates basic design principles through abstract and applied design
projects in two-dimensional and three-dimensional media. Design
exercises will advance understanding of the design process by exploring
conceptual ideas through graphic and oral communication.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 107 [Min Grade: C]

ARCH 109 Foundation Design III 2.0 Credits
Investigates basic design principles that emphasize the inter-relationship
between the scale of the human body and its movement within three-
dimensional space. More in-depth design exercises will address the
design process, development of a conceptual idea and a higher-level
graphic and oral presentation.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 108 [Min Grade: C]

ARCH 141 Architecture and Society I 3.0 Credits
Examines the evolution of Western architectural thought, form, space,
and structures in light of changing human values and institutions. Covers
Western architecture from the prehistoric era through the Romanesque,
and contemporary architecture in Asia and Central America as well as
Islamic architecture in the Middle East and Spain.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARCH 142 Architecture and Society II 3.0 Credits
Examines the evolution of Western architectural thought, form, space
and structures in light of changing human values and institutions. Course
covers early monumental architecture of the Western Hemisphere and
then considers the evolution of Western architecture from the "Dark Ages"
through the development and spread of Renaissance architecture across
Europe and Latin America.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 141 [Min Grade: C-]

ARCH 143 Architecture and Society III 3.0 Credits
Examines the evolution of Western architectural thought, form, space
and structures in light of changing human values and institutions. Covers
Western architecture and urbanism from the 16th C through the early
20th C. Also considered is the architecture of the Aztec and Inca empires,
Islamic architecture and architecture and landscape designs of 16th C and
17th C Japan.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 142 [Min Grade: C-]

ARCH 144 Architecture and Society IV 3.0 Credits
Examines the evolution of architectural thought, form, space and
structures in light of changing human values and institutions. Surveys the
crucial buildings and thematic development of modern architecture and
urbanism beginning in the late 19th C. through the mid-20th C.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-]

ARCH 170 Architectural Technology I 3.0 Credits
Introduction to the fundamental aspects of building technology with
exposure to materials, structure and building systems that are frequently
used in building construction. Provides a framework for the exploration of
construction in the context of design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: PHYS 182 [Min Grade: C-] and (MATH 102 [Min Grade:
C-] or MATH 183 [Min Grade: C-])

ARCH 172 Architectural Technology II 3.0 Credits
Further exploration of materials, structure and building systems and their
influence on passive systems and sustainable design principles. Begins
the development of systematic thinking regarding architectural technology.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 170 [Min Grade: C-]

ARCH 173 Architectural Technology III 3.0 Credits
Introduction to the technical building analysis including the organizing
principles for materials, structure and systems. Includes envelope
assembly, thermal comfort, structural and passive building systems.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 172 [Min Grade: C-]

ARCH 181 Architecture Studio 1A 4.0 Credits
Introduces basic architectural design principles. Elementary concepts of space, surface and form will be explored in two and three dimensional abstract exercises. Exercises incorporate observational analysis and graphic skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.

ARCH 182 Architecture Studio 1B 4.0 Credits
Transitions from abstract design principles to simple architectural exercises, considering function, scale, user and ordering strategies in relation to form-making in three-dimensional space. Exercises heighten observation and graphic skills while developing an architectural vocabulary.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 181 [Min Grade: C-]

ARCH 183 Architecture Studio 1C 4.0 Credits
Focuses on a series of basic architectural problems developed around issues of context and material use in relationship to the organization of space and human activity. Design exercises will cultivate the design process through developing a conceptual idea through graphic and oral communication.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 182 [Min Grade: C-] or INTR 233 [Min Grade: C-]

ARCH 191 Studio 1-AE 3.0 Credits
Architectural engineering majors only. Covers basic design principles using three-dimensional abstract and applied projects. Exercises heighten observation skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is AE.

ARCH 192 Studio 2-AE 3.0 Credits
Architectural engineering majors only. Continues ARCH 191. Uses design exercises to emphasize the nature of function, structure, and material and their impact on the design process.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is AE.
Prerequisites: ARCH 191 [Min Grade: D]

ARCH 211 Architectural Representation I 2.0 Credits
Introductory course that will provide a survey of drawing types with an emphasis on process and visual literacy.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.

ARCH 212 Architectural Representation II 2.0 Credits
Emphasis on craft and composition in the architectural representation of the built environment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 211 [Min Grade: C-]

ARCH 213 Architectural Representation III 2.0 Credits
Exploration of digital representation with an emphasis on making combining process drawing, digital fabrication and analog craft to develop three-dimensional representation skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 212 [Min Grade: C-]

ARCH 221 Materials & Methods I 1.5 Credit
Introduction to the fundamental aspects of building technology with exposure to materials and methods that are frequently used in building construction. Provides a framework for the exploration of construction in the context of design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 183 [Min Grade: C-]

ARCH 222 Materials & Methods II 1.5 Credit
Further exploration of materials, structure and building systems and their influence on passive systems and sustainable design principles. Begins the development of systematic thinking regarding architectural technology.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 221 [Min Grade: C-]

ARCH 223 Materials & Methods III 1.5 Credit
Introduction to technical building analysis including the organizing principles for materials, structure and systems. Includes envelope assembly, thermal comfort, structural and passive building systems.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 222 [Min Grade: C-]

ARCH 224 Architectural Representation IV 2.0 Credits
Emphasizes the communication of design through perspective, view-making and rendering. Through the use of digital and analog techniques, the ability to select the proper media to visually convey a design concept will be developed.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 213 [Min Grade: C-] and ARCH 183 [Min Grade: C-]

ARCH 225 Architectural Representation V 2.0 Credits
Emphasizes the tools to complete a final quality architectural presentation in a variety of venues including portfolios, digital representations and online media.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 224 [Min Grade: C-] and ARCH 281 [Min Grade: C-]

ARCH 226 Architectural Representation VI 2.0 Credits
Explores parametric thinking and the iterative design process while reinforcing critical skills in detailing and design development through various software programs.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 225 [Min Grade: C-] and ARCH 282 [Min Grade: C-]

ARCH 251 Structural Systems I 1.5 Credit
Introduction to the fundamental aspects of structural systems with exposure to materials and methods that are frequently used in building construction. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 183 [Min Grade: C-] and PHYS 182 [Min Grade: C-] and (MATH 102 [Min Grade: C-] or MATH 173 [Min Grade: C-] or MATH 183 [Min Grade: C-])

ARCH 252 Structural Systems II 1.5 Credit
Further introduction to the fundamental aspects of structural systems with exposure to materials and methods that are frequently used in building construction. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 251 [Min Grade: C-]

ARCH 253 Structural Systems III 1.5 Credit
Introduction and intermediate aspects of structural systems with exposure to materials and methods that are frequently used in building construction. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 252 [Min Grade: C-]

ARCH 261 Environmental Systems I 3.0 Credits
Introduces heating, ventilation, and air conditioning systems and site utility planning. Fall.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 104 [Min Grade: C-] or PHYS 184 [Min Grade: C-]

ARCH 262 Environmental Systems II 3.0 Credits
Introduces plumbing systems, including site distribution, water distribution, and waste systems. Fire protection is also covered. Winter.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 104 [Min Grade: C-] or PHYS 184 [Min Grade: C-]

ARCH 274 Architectural Technology IV 3.0 Credits
Intermediate development of architectural technology with a focus on application of analysis of primary materials, structure and systems. Depth and range of analytical tools are addressed.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 173 [Min Grade: C-] and PHYS 183 [Min Grade: C-]

ARCH 275 Architectural Technology V 3.0 Credits
Further development of analytical skills for building technology. Case studies and real world precedents examine materials, structure and systems in the support of larger architectural objectives.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 274 [Min Grade: C-]

ARCH 276 Architectural Technology VI 3.0 Credits
Examination of technical analysis and design in support of iterative architectural concepts. Materials, structure and systems are utilized to develop strong design synergies.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 275 [Min Grade: C-]

ARCH 281 Architecture Studio 2A 4.0 Credits
Introduces issues of architectural form, site and programmatic concerns. Design exercises will explore simple issues of structure, building and material systems and sustainability.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 183 [Min Grade: C-] and (ARCH 213 [Min Grade: C-] or INTR 245 [Min Grade: C-])

ARCH 282 Architecture Studio 2B 4.0 Credits
Covers architectural design problems of incremental complexity that emphasizes the nature of function, structure, and material and their impact on the design process.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ((ARCH 221 [Min Grade: C-] and ARCH 251 [Min Grade: C-]) or ARCH 170 [Min Grade: C-] or INTR 351 [Min Grade: C-],) and ARCH 281 [Min Grade: C-] and (ARCH 224 [Min Grade: C-] or INTR 341 [Min Grade: C-])

ARCH 283 Architecture Studio 2C 4.0 Credits
Explores architectural design problems that introduce the full range of
challenges in the areas of organization, program, context, systems and
formal expression.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ((ARCH 222 [Min Grade: C-] and ARCH 252 [Min Grade:
C-]) or ARCH 170 [Min Grade: C-],) and ARCH 282 [Min Grade: C-] and
ARCH 225 [Min Grade: C-]

ARCH 291 Building Systems I 1.5 Credit
Introduction to architectural technology with a focus on application of
analysis pertaining to environmental systems within the context of building
design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 283 [Min Grade: C-] and PHYS 182 [Min Grade: C-]
and (MATH 102 [Min Grade: C-] or MATH 173 [Min Grade: C-] or MATH
183 [Min Grade: C-])

ARCH 292 Building Systems II 1.5 Credit
Introduction to architectural technology with a focus on design impacts
and analysis related to water within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 291 [Min Grade: C-]

ARCH 293 Building Systems III 1.5 Credit
Introduction to architectural technology with a focus on design impacts
and analysis related to lighting within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 292 [Min Grade: C-]

ARCH 315 Sustainable Built Environment I 3.0 Credits
Provides an overview of contemporary sustainable design principles and
systems involved to posit novel solutions to various design challenges.
Combining theoretical knowledge, field trips and case studies enabling
students to critically assess sustainability as it relates to the built
environment through five key subsystems: materials, air, water, energy
and life.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ARCH 320 Sustainable Built Environment II 3.0 Credits
Students will examine the work of scientists, designers, authors,
artists, architects, engineers, planners, etc to gain a deeper conceptual
understanding of current and emerging strategies in sustainability and the
complex and integrated systems approach to the built environment in the
present and near future.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ARCH 315 [Min Grade: C-]

ARCH 324 Materials & Methods IV 1.5 Credit
Advanced building technology concepts are explored through case
studies and focused design examples. Materials, construction, methods,
structure, systems and envelope are studied as integrated aspect of larger
iterative design processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 173 [Min Grade: C-] or ARCH 223 [Min Grade: C-]

ARCH 325 Materials & Methods V 1.5 Credit
Further exploration of advanced building technology concepts through
case studies and focused design examples. Materials, construction,
methods, structure, systems and envelope are studied as integrated
aspect of larger iterative design processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 324 [Min Grade: C-]

ARCH 326 Materials & Methods VI 1.5 Credit
Advanced integration of building technology concepts through design
problems and examples. Materials, construction, methods, structure,
systems and envelope are studied as integrated aspect of larger iterative
design processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 325 [Min Grade: C-]

ARCH 335 Professional Practice I 3.0 Credits
This seminar is the first of a two-course sequence that introduces
students to varying topics related to architectural practice in today's
society. It addresses the following issues: Community and Social
Responsibility, Leadership, Ethics & Professional Judgment, Client Role in
Architecture, Basic Principles of Architectural Practice.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH or major is INTR.
Prerequisites: ARCH 243 [Min Grade: C-] or ARCH 383 [Min Grade: C-]

ARCH 336 Professional Practice II 3.0 Credits
This seminar is the second of a two-course sequence that introduces
students to varying topics related to architectural practice in today's
society. It addresses the following issues: Practice Management, Project
Management, Financial Considerations, Legal Responsibilities, Ethics &
Professional Judgment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH or major is INTR.
Prerequisites: ARCH 335 [Min Grade: C-]

ARCH 340 American Architecture & Urbanism 3.0 Credits
Surveys the development of American architecture and urbanism from
its Native American origins through the arrival of early Modernism in the
1930s and 1940s. Writing Intensive.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 341 [WI] Theories of Architecture I 3.0 Credits
Seminar that examines theories and principles of Western architecture before 1700. History/theory elective. Fall. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 342 [WI] Theories of Architecture II 3.0 Credits
Continues ARCH 341. Seminar that examines theories and principles of Western architecture from the Baroque era of the 17th century to the beginning of Modernism in the 20th century. History/theory elective. Winter. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 343 Theories of Architecture III 3.0 Credits
Seminar that examines 20th-century theories of architecture, including analysis and discussion of current theoretical positions. History/theory elective. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 344 [WI] History of Modern Architecture I 3.0 Credits
Surveys the crucial buildings and thematic development of modern architecture and urbanism beginning in the late nineteenth Century continuing through the mid-20th Century. History/theory elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-]

ARCH 345 [WI] History of Modern Architecture II 3.0 Credits
Continuation of ARCH 344. Surveys the crucial buildings and thematic development of modern architecture and urbanism from the mid-20th Century to the present. History/theory elective. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-]

ARCH 346 [WI] History of Philadelphia Architecture 3.0 Credits
Covers the architecture of the city of Philadelphia from 1682, examining its architects, styles, and sources through lectures, walking tours, and student reports. History/theory elective. Fall. Alternate years. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 347 [WI] Intensive Architectural Studies 1.0-6.0 Credit
An intensive study tour of selected domestic and foreign destinations focusing on architecture and related design disciplines. Combines lecture, site visits, sketching and individual research. History/Theory Elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ARCH 143 [Min Grade: C-] or INTR 200 [Min Grade: C-] or ARTH 103 [Min Grade: C-]

ARCH 348 [WI] Studies in Vernacular Architecture 3.0 Credits
A topical survey of world traditions of vernacular architecture, with emphasis on houses and dwelling environments. The survey topics include basics of shelter, construction methods, response to climate, patterns of settlement, social and economic organization, cultural expression, and methods of research and analysis.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 350 Contemporary Architecture 3.0 Credits
Survey and analysis of significant developments in architecture and urbanism over the past 50+ years. Writing Intensive.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 354 Structural Systems IV 1.5 Credit
Intermediate aspects of structural systems with exposure to materials and methods that are frequently used in building construction. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 173 [Min Grade: C-] or ARCH 253 [Min Grade: C-]

ARCH 355 Structural Systems V 1.5 Credit
Intermediate structural analysis for architectural design. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 354 [Min Grade: C-]

ARCH 356 Structural Systems VI 1.5 Credit
Intermediate structural analysis for architectural design with a focus on composite systems. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 355 [Min Grade: C-]

ARCH 361 Studio 6-1 4.0 Credits
Introduces problems of urban design. Case studies demonstrate the relationship between the manmade environment and the natural environment as well as the relationship between many buildings and other manmade environments and the natural environment. Fall.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 353 [Min Grade: D] and ARCH 263 [Min Grade: C-]
Corequisite: ARCH 335

ARCH 362 Studio 6-2 4.0 Credits
Continues ARCH 361. A large urban-design project is undertaken to learn the design process required to solve problems of such magnitude. Winter.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 361 [Min Grade: D]
Corequisite: ARCH 336

ARCH 363 Studio 6-3 4.0 Credits
Continues ARCH 362. Requires students to develop architectural
solutions for a portion of the problem addressed in Studio 6-2,
demonstrating an understanding of the relationship between buildings and
the exterior environment established in the previous course. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 362 [Min Grade: D]
Corequisite: PHIL 317

ARCH 377 Architectural Technology VII 3.0 Credits
Advanced building technology concepts are explored through case
studies and focused design examples. Materials, construction, methods,
structure, systems and envelope are studied as integrated aspect of larger
iterative design processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 276 [Min Grade: C-]

ARCH 378 Architectural Technology VIII 3.0 Credits
Building technology and analysis are explored through design precedents
and sketch problems to develop integrated design and analytical skills.
Focuses on large and small scale elements that can become generative
and performative aspects of major design decisions.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 377 [Min Grade: C-]

ARCH 379 Architectural Technology IX 3.0 Credits
Advanced building technology design and analysis is utilized in iterative
and integrated design methods to support comprehensive design
processes. Materials, structure and systems are developed qualitatively
and quantitatively through design and analysis exercises.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 378 [Min Grade: C-]

ARCH 381 Architecture Studio 3A 4.0 Credits
Investigates the design relationship between man-made and the natural
environment. Cultivates advanced analysis methods and the development
of informed and resolved design solutions.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 283 [Min Grade: C-] and ARCH 226 [Min Grade:
C-] and ARCH 173 [Min Grade: C-] or (ARCH 223 [Min Grade: C-] and
ARCH 253 [Min Grade: C-])

ARCH 382 Architecture Studio 3B 4.0 Credits
Studies the relationship between building, site and context. Architectural
design problems emphasize concept development that translates careful
analysis into the building ideas with a progressing understanding of
architectural concerns.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 381 [Min Grade: C-] and ARCH 274 [Min Grade:
C-] or (ARCH 291 [Min Grade: C-] and ARCH 354 [Min Grade: C-])

ARCH 383 Architecture Studio 3C 4.0 Credits
Focuses on architectural problems with intermediate complexity.
Integrates issues of context, site, program, function, and architectural
systems into advanced design proposals.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 382 [Min Grade: C-] and ARCH 275 [Min Grade:
C-] or (ARCH 292 [Min Grade: C-] and ARCH 355 [Min Grade: C-])

ARCH 394 Building Systems IV 1.5 Credit
Intermediate study of architectural technology with a focus on design
impacts and analysis related to mechanical systems within the context of
building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 276 [Min Grade: C-] or ARCH 293 [Min Grade: C-]

ARCH 395 Building Systems V 1.5 Credit
Intermediate study of architectural technology with a focus on
design impacts and analysis related to acoustical design and energy
consumption within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 394 [Min Grade: C-]

ARCH 396 Building Systems VI 1.5 Credit
Intermediate study of architectural technology with a focus on design
impacts and analysis related to lighting and electrical systems within the
context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 395 [Min Grade: C-]

**ARCH 421 [WI] Environmental Psychology and Design Theory 3.0
Credits**
Examines the relationship between human behavior and architecture from
the perspective of environmental psychology. Topics include aesthetics,
environmental experience, social interaction, social organization, and
culture. This is a writing intensive course. History/Theory Elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 431 [WI] Architectural Programming 3.0 Credits
Introduces current techniques of building programming and their
relationship to building design. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 353 [Min Grade: C-] or ARCH 483 [Min Grade: C-]

ARCH 432 The Development Process 3.0 Credits
Introduces the process of land development. Explores traditional and
emerging development models (the architect as the equity participant
and developer) in relation to new construction and rehabilitation. Covers
various methods of initiating building projects and financing and tax
issues. Professional elective. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARCH 441 Urban Design Seminar 3.0 Credits
Expands the concept of architecture to urban design scale and presents
the principles of city planning through a series of case studies. History/
Theory Elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 451 Advanced Drawing 3.0 Credits
Covers advanced architectural rendering, concentrating on the effects
of light, shade, and color using the techniques of water-color rendering.
Professional elective. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 226 [Min Grade: C-] or INTR 341 [Min Grade: C-]

ARCH 455 Computer Applications in Architecture I 3.0 Credits
Covers two-dimensional and three-dimensional computer representations
and applications. Professional elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 226 [Min Grade: C-]

ARCH 456 Computer Applications in Architecture II 3.0 Credits
Further investigates and demonstrates the computer's capabilities in
architectural design and representation. Professional elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 226 [Min Grade: C-]

ARCH 463 Emerging Architectural Technology 3.0 Credits
A holistic study of design and construction technology of significant
buildings by leading architects.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 161 [Min Grade: C-] or ARCH 173 [Min Grade: C-]
or ARCH 253 [Min Grade: C-]

ARCH 464 Building Enclosure Design 3.0 Credits
Examines the integrations of aesthetics, building science, and technology
in the design of building enclosures. Professional Elective. Summer.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: or ARCH 173 [Min Grade: C-] or ARCH 253 [Min Grade:
C-]

ARCH 465 Energy and Architecture 3.0 Credits
Creates an awareness of the availability of energy resources and their
effect on the built environment. Discusses alternative sources of energy.
Professional elective. Summer.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 173 [Min Grade: C-] or ARCH 253 [Min Grade: C-]

ARCH 481 Architecture Studio 4A 4.0 Credits
Focuses on more complex architectural challenges through analysis of
case studies that address the relationship between the man-made built
environment and the natural environment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 383 [Min Grade: C-] and ARCH 276 [Min Grade:
C-] or (ARCH 356 [Min Grade: C-] and ARCH 293 [Min Grade: C-])

ARCH 482 Architecture Studio 4B 4.0 Credits
Furthers the understanding of context and design and the application
of solutions and strategies surrounding more complex architectural and
environmental problems.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 481 [Min Grade: C-] and ARCH 377 [Min Grade:
C-] or (ARCH 324 [Min Grade: C-] and ARCH 394 [Min Grade: C-])

ARCH 483 Architecture Studio 4C 4.0 Credits
Challenges to develop and refine architectural solutions through an
advanced understanding of the relationship between buildings and
environment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 482 [Min Grade: C-] and ARCH 378 [Min Grade:
C-] or (ARCH 325 [Min Grade: C-] and ARCH 395 [Min Grade: C-])

ARCH 487 Architecture Studio 5A 4.0 Credits
Addresses the complex relationship through analysis and synthesis of
form, site, program, building technology and theory within specific building
context.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 483 [Min Grade: C-] and ARCH 379 [Min Grade:
C-] or (ARCH 326 [Min Grade: C-] and ARCH 356 [Min Grade: C-] and
ARCH 396 [Min Grade: C-])

ARCH 488 Architecture Studio 5B 4.0 Credits
Emphasizes complex architectural problems while demonstrating
understanding and appropriate application.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 487 [Min Grade: C-]

ARCH 489 Architecture Studio 5C 4.0 Credits
Integrates in-depth application and coordination of all architectural
building criteria in a large scale and complex architectural problem.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 488 [Min Grade: C-]

ARCH 493 Senior Project I 4.0 Credits
Students develop a three-term capstone design project to pursue and
explore architectural concepts in depth. Students take a project from
concept, research, programming to complete design development. Part
one of three.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: (ARCH 363 [Min Grade: C-] or ARCH 489 [Min Grade: C-])
and ARCH 431 [Min Grade: C-]

ARCH 494 Senior Project II 4.0 Credits
Students develop a three-term capstone design project to pursue and
explore architectural concepts in depth. Students take a project from
concept, research, programming to complete design development. Part
two of three.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 493 [Min Grade: C-]

ARCH 495 Senior Project III 4.0 Credits
Students develop a three-term capstone design project to pursue and
explore architectural concepts in depth. Students take a project from
concept, research, programming to complete design development. Part
three of three.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 494 [Min Grade: C-]

ARCH 496 Thesis I 8.0 Credits
An individually structured year-long design problem that enables students
to work independently and explore complex issues in depth. Periodic
individual review sessions are scheduled with faculty adviser. Fall.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 363 [Min Grade: D] and ARCH 143 [Min Grade: C-]
and (ARCH 134 [Min Grade: C-] or ARCH 153 [Min Grade: C-] or ARCH
226 [Min Grade: C-]) and (ARCH 263 [Min Grade: C-] and ARCH 273 [Min
Grade: C-]) or ARCH 379 [Min Grade: C-]

ARCH 497 Thesis II 8.0 Credits
Continues ARCH 496. Winter.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 496 [Min Grade: C-]

ARCH 498 Thesis III 8.0 Credits
Continues ARCH 497. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 497 [Min Grade: C-]

ARCH I199 Independent Study in Architecture 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH I299 Independent Study in Architecture 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH I399 Independent Study in Architecture 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH I499 Independent Study in Architecture 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ARCH 143 [Min Grade: C]

ARCH T180 Special Topics in Architecture 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH T280 Special Topics in Architecture 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH T380 Special Topics in Architecture 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH T480 Special Topics in Architecture 1.0-6.0 Credit
Covers special topics in architectural history, theory, or technology that
satisfy history/theory or professional elective requirements.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ARCH 143 [Min Grade: C]

Courses

ARCH 107 Foundation Design I 2.0 Credits
Introduces basic design principles through investigation of abstract and applied design projects using two-dimensional media. Exercises heighten observation and graphic skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARCH 108 Foundation Design II 2.0 Credits
Investigates basic design principles through abstract and applied design projects in two-dimensional and three-dimensional media. Design exercises will advance understanding of the design process by exploring conceptual ideas through graphic and oral communication.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 107 [Min Grade: C]

ARCH 109 Foundation Design III 2.0 Credits
Investigates basic design principles that emphasize the inter-relationship between the scale of the human body and its movement within three-dimensional space. More in-depth design exercises will address the design process, development of a conceptual idea and a higher-level graphic and oral presentation.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 108 [Min Grade: C]

ARCH 141 Architecture and Society I 3.0 Credits
Examines the evolution of Western architectural thought, form, space, and structures in light of changing human values and institutions. Covers Western architecture from the prehistoric era through the Romanesque, and contemporary architecture in Asia and Central America as well as Islamic architecture in the Middle East and Spain.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARCH 142 Architecture and Society II 3.0 Credits
Examines the evolution of Western architectural thought, form, space and structures in light of changing human values and institutions. Course covers early monumental architecture of the Western Hemisphere and then considers the evolution of Western architecture from the "Dark Ages" through the development and spread of Renaissance architecture across Europe and Latin America.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 141 [Min Grade: C-]

ARCH 143 Architecture and Society III 3.0 Credits
Examines the evolution of Western architectural thought, form, space and structures in light of changing human values and institutions. Covers Western architecture and urbanism from the 16th C through the early 20th C. Also considered is the architecture of the Aztec and Inca empires, Islamic architecture and architecture and landscape designs of 16th C and 17th C Japan.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 142 [Min Grade: C-]

ARCH 144 Architecture and Society IV 3.0 Credits
Examines the evolution of architectural thought, form, space and structures in light of changing human values and institutions. Surveys the crucial buildings and thematic development of modern architecture and urbanism beginning in the late 19th C. through the mid-20th C.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-]

ARCH 170 Architectural Technology I 3.0 Credits
Introduction to the fundamental aspects of building technology with exposure to materials, structure and building systems that are frequently used in building construction. Provides a framework for the exploration of construction in the context of design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: PHYS 182 [Min Grade: C-] and (MATH 102 [Min Grade: C-] or MATH 183 [Min Grade: C-])

ARCH 172 Architectural Technology II 3.0 Credits
Further exploration of materials, structure and building systems and their influence on passive systems and sustainable design principles. Begins the development of systematic thinking regarding architectural technology.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 170 [Min Grade: C-]

ARCH 173 Architectural Technology III 3.0 Credits
Introduction to the technical building analysis including the organizing principles for materials, structure and systems. Includes envelope assembly, thermal comfort, structural and passive building systems.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 172 [Min Grade: C-]

ARCH 181 Architecture Studio 1A 4.0 Credits
Introduces basic architectural design principles. Elementary concepts of space, surface and form will be explored in two and three dimensional abstract exercises. Exercises incorporate observational analysis and graphic skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.

ARCH 182 Architecture Studio 1B 4.0 Credits
Transitions from abstract design principles to simple architectural exercises, considering function, scale, user and ordering strategies in relation to form-making in three-dimensional space. Exercises heighten observation and graphic skills while developing an architectural vocabulary.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 181 [Min Grade: C-]

ARCH 183 Architecture Studio 1C 4.0 Credits
Focuses on a series of basic architectural problems developed around issues of context and material use in relationship to the organization of space and human activity. Design exercises will cultivate the design process through developing a conceptual idea through graphic and oral communication.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 182 [Min Grade: C-] or INTR 233 [Min Grade: C-]

ARCH 191 Studio 1-AE 3.0 Credits
Architectural engineering majors only. Covers basic design principles using three-dimensional abstract and applied projects. Exercises heighten observation skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is AE.

ARCH 192 Studio 2-AE 3.0 Credits
Architectural engineering majors only. Continues ARCH 191. Uses design exercises to emphasize the nature of function, structure, and material and their impact on the design process.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is AE.
Prerequisites: ARCH 191 [Min Grade: D]

ARCH 211 Architectural Representation I 2.0 Credits
Introductory course that will provide a survey of drawing types with an emphasis on process and visual literacy.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.

ARCH 212 Architectural Representation II 2.0 Credits
Emphasis on craft and composition in the architectural representation of the built environment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 211 [Min Grade: C-]

ARCH 213 Architectural Representation III 2.0 Credits
Exploration of digital representation with an emphasis on making combining process drawing, digital fabrication and analog craft to develop three-dimensional representation skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 212 [Min Grade: C-]

ARCH 221 Materials & Methods I 1.5 Credit
Introduction to the fundamental aspects of building technology with exposure to materials and methods that are frequently used in building construction. Provides a framework for the exploration of construction in the context of design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 183 [Min Grade: C-]

ARCH 222 Materials & Methods II 1.5 Credit
Further exploration of materials, structure and building systems and their influence on passive systems and sustainable design principles. Begins the development of systematic thinking regarding architectural technology.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 221 [Min Grade: C-]

ARCH 223 Materials & Methods III 1.5 Credit
Introduction to technical building analysis including the organizing principles for materials, structure and systems. Includes envelope assembly, thermal comfort, structural and passive building systems.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 222 [Min Grade: C-]

ARCH 224 Architectural Representation IV 2.0 Credits
Emphasizes the communication of design through perspective, view-making and rendering. Through the use of digital and analog techniques, the ability to select the proper media to visually convey a design concept will be developed.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 213 [Min Grade: C-] and ARCH 183 [Min Grade: C-]

ARCH 225 Architectural Representation V 2.0 Credits
Emphasizes the tools to complete a final quality architectural presentation in a variety of venues including portfolios, digital representations and online media.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 224 [Min Grade: C-] and ARCH 281 [Min Grade: C-]

ARCH 226 Architectural Representation VI 2.0 Credits
Explores parametric thinking and the iterative design process while reinforcing critical skills in detailing and design development through various software programs.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 225 [Min Grade: C-] and ARCH 282 [Min Grade: C-]

ARCH 251 Structural Systems I 1.5 Credit
Introduction to the fundamental aspects of structural systems with exposure to materials and methods that are frequently used in building construction. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 183 [Min Grade: C-] and PHYS 182 [Min Grade: C-] and (MATH 102 [Min Grade: C-] or MATH 173 [Min Grade: C-] or MATH 183 [Min Grade: C-])

ARCH 252 Structural Systems II 1.5 Credit
Further introduction to the fundamental aspects of structural systems with exposure to materials and methods that are frequently used in building construction. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 251 [Min Grade: C-]

ARCH 253 Structural Systems III 1.5 Credit
Introduction and intermediate aspects of structural systems with exposure to materials and methods that are frequently used in building construction. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 252 [Min Grade: C-]

ARCH 261 Environmental Systems I 3.0 Credits
Introduces heating, ventilation, and air conditioning systems and site utility planning. Fall.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 104 [Min Grade: C-] or PHYS 184 [Min Grade: C-]

ARCH 262 Environmental Systems II 3.0 Credits
Introduces plumbing systems, including site distribution, water distribution, and waste systems. Fire protection is also covered. Winter.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 104 [Min Grade: C-] or PHYS 184 [Min Grade: C-]

ARCH 274 Architectural Technology IV 3.0 Credits
Intermediate development of architectural technology with a focus on application of analysis of primary materials, structure and systems. Depth and range of analytical tools are addressed.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 173 [Min Grade: C-] and PHYS 183 [Min Grade: C-]

ARCH 275 Architectural Technology V 3.0 Credits
Further development of analytical skills for building technology. Case studies and real world precedents examine materials, structure and systems in the support of larger architectural objectives.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 274 [Min Grade: C-]

ARCH 276 Architectural Technology VI 3.0 Credits
Examination of technical analysis and design in support of iterative architectural concepts. Materials, structure and systems are utilized to develop strong design synergies.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 275 [Min Grade: C-]

ARCH 281 Architecture Studio 2A 4.0 Credits
Introduces issues of architectural form, site and programmatic concerns. Design exercises will explore simple issues of structure, building and material systems and sustainability.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 183 [Min Grade: C-] and (ARCH 213 [Min Grade: C-] or INTR 245 [Min Grade: C-])

ARCH 282 Architecture Studio 2B 4.0 Credits
Covers architectural design problems of incremental complexity that emphasizes the nature of function, structure, and material and their impact on the design process.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ((ARCH 221 [Min Grade: C-] and ARCH 251 [Min Grade: C-]) or ARCH 170 [Min Grade: C-] or INTR 351 [Min Grade: C-],) and ARCH 281 [Min Grade: C-] and (ARCH 224 [Min Grade: C-] or INTR 341 [Min Grade: C-])

ARCH 283 Architecture Studio 2C 4.0 Credits
Explores architectural design problems that introduce the full range of challenges in the areas of organization, program, context, systems and formal expression.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ((ARCH 222 [Min Grade: C-] and ARCH 252 [Min Grade: C-]) or ARCH 170 [Min Grade: C-],) and ARCH 282 [Min Grade: C-] and ARCH 225 [Min Grade: C-]

ARCH 291 Building Systems I 1.5 Credit
Introduction to architectural technology with a focus on application of analysis pertaining to environmental systems within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 283 [Min Grade: C-] and PHYS 182 [Min Grade: C-] and (MATH 102 [Min Grade: C-] or MATH 173 [Min Grade: C-] or MATH 183 [Min Grade: C-])

ARCH 292 Building Systems II 1.5 Credit
Introduction to architectural technology with a focus on design impacts and analysis related to water within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 291 [Min Grade: C-]

ARCH 293 Building Systems III 1.5 Credit
Introduction to architectural technology with a focus on design impacts and analysis related to lighting within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 292 [Min Grade: C-]

ARCH 315 Sustainable Built Environment I 3.0 Credits
Provides an overview of contemporary sustainable design principles and systems involved to posit novel solutions to various design challenges. Combining theoretical knowledge, field trips and case studies enabling students to critically assess sustainability as it relates to the built environment through five key subsystems: materials, air, water, energy and life.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ARCH 320 Sustainable Built Environment II 3.0 Credits
Students will examine the work of scientists, designers, authors, artists, architects, engineers, planners, etc to gain a deeper conceptual understanding of current and emerging strategies in sustainability and the complex and integrated systems approach to the built environment in the present and near future.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ARCH 315 [Min Grade: C-]

ARCH 324 Materials & Methods IV 1.5 Credit
Advanced building technology concepts are explored through case studies and focused design examples. Materials, construction, methods, structure, systems and envelope are studied as integrated aspect of larger iterative design processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 173 [Min Grade: C-] or ARCH 223 [Min Grade: C-]

ARCH 325 Materials & Methods V 1.5 Credit
Further exploration of advanced building technology concepts through case studies and focused design examples. Materials, construction, methods, structure, systems and envelope are studied as integrated aspect of larger iterative design processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 324 [Min Grade: C-]

ARCH 326 Materials & Methods VI 1.5 Credit
Advanced integration of building technology concepts through design problems and examples. Materials, construction, methods, structure, systems and envelope are studied as integrated aspect of larger iterative design processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 325 [Min Grade: C-]

ARCH 335 Professional Practice I 3.0 Credits
This seminar is the first of a two-course sequence that introduces students to varying topics related to architectural practice in today's society. It addresses the following issues: Community and Social Responsibility, Leadership, Ethics & Professional Judgment, Client Role in Architecture, Basic Principles of Architectural Practice.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH or major is INTR.
Prerequisites: ARCH 243 [Min Grade: C-] or ARCH 383 [Min Grade: C-]

ARCH 336 Professional Practice II 3.0 Credits
This seminar is the second of a two-course sequence that introduces students to varying topics related to architectural practice in today's society. It addresses the following issues: Practice Management, Project Management, Financial Considerations, Legal Responsibilities, Ethics & Professional Judgment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH or major is INTR.
Prerequisites: ARCH 335 [Min Grade: C-]

ARCH 340 American Architecture & Urbanism 3.0 Credits
Surveys the development of American architecture and urbanism from its Native American origins through the arrival of early Modernism in the 1930s and 1940s. Writing Intensive.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 341 [WI] Theories of Architecture I 3.0 Credits
Seminar that examines theories and principles of Western architecture before 1700. History/theory elective. Fall. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 342 [WI] Theories of Architecture II 3.0 Credits
Continues ARCH 341. Seminar that examines theories and principles of Western architecture from the Baroque era of the 17th century to the beginning of Modernism in the 20th century. History/theory elective. Winter. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 343 Theories of Architecture III 3.0 Credits
Seminar that examines 20th-century theories of architecture, including analysis and discussion of current theoretical positions. History/theory elective. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 344 [WI] History of Modern Architecture I 3.0 Credits
Surveys the crucial buildings and thematic development of modern architecture and urbanism beginning in the late nineteenth Century continuing through the mid-20th Century. History/theory elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-]

ARCH 345 [WI] History of Modern Architecture II 3.0 Credits
Continuation of ARCH 344. Surveys the crucial buildings and thematic development of modern architecture and urbanism from the mid-20th Century to the present. History/theory elective. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-]

ARCH 346 [WI] History of Philadelphia Architecture 3.0 Credits
Covers the architecture of the city of Philadelphia from 1682, examining its architects, styles, and sources through lectures, walking tours, and student reports. History/theory elective. Fall. Alternate years. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 347 [WI] Intensive Architectural Studies 1.0-6.0 Credit
An intensive study tour of selected domestic and foreign destinations focusing on architecture and related design disciplines. Combines lecture, site visits, sketching and individual research. History/Theory Elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ARCH 143 [Min Grade: C-] or INTR 200 [Min Grade: C-] or ARTH 103 [Min Grade: C-]

ARCH 348 [WI] Studies in Vernacular Architecture 3.0 Credits
A topical survey of world traditions of vernacular architecture, with emphasis on houses and dwelling environments. The survey topics include basics of shelter, construction methods, response to climate, patterns of settlement, social and economic organization, cultural expression, and methods of research and analysis.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 350 Contemporary Architecture 3.0 Credits
Survey and analysis of significant developments in architecture and urbanism over the past 50+ years. Writing Intensive.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 354 Structural Systems IV 1.5 Credit
Intermediate aspects of structural systems with exposure to materials and methods that are frequently used in building construction. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 173 [Min Grade: C-] or ARCH 253 [Min Grade: C-]

ARCH 355 Structural Systems V 1.5 Credit
Intermediate structural analysis for architectural design. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 354 [Min Grade: C-]

ARCH 356 Structural Systems VI 1.5 Credit
Intermediate structural analysis for architectural design with a focus on composite systems. Develops skills needed for structural integration in building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 355 [Min Grade: C-]

ARCH 361 Studio 6-1 4.0 Credits
Introduces problems of urban design. Case studies demonstrate the relationship between the manmade environment and the natural environment as well as the relationship between many buildings and other manmade environments and the natural environment. Fall.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 353 [Min Grade: D] and ARCH 263 [Min Grade: C-]
Corequisite: ARCH 335

ARCH 362 Studio 6-2 4.0 Credits
Continues ARCH 361. A large urban-design project is undertaken to learn the design process required to solve problems of such magnitude. Winter.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 361 [Min Grade: D]
Corequisite: ARCH 336

ARCH 363 Studio 6-3 4.0 Credits
Continues ARCH 362. Requires students to develop architectural solutions for a portion of the problem addressed in Studio 6-2, demonstrating an understanding of the relationship between buildings and the exterior environment established in the previous course. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 362 [Min Grade: D]
Corequisite: PHIL 317

ARCH 377 Architectural Technology VII 3.0 Credits
Advanced building technology concepts are explored through case studies and focused design examples. Materials, construction, methods, structure, systems and envelope are studied as integrated aspect of larger iterative design processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 276 [Min Grade: C-]

ARCH 378 Architectural Technology VIII 3.0 Credits
Building technology and analysis are explored through design precedents and sketch problems to develop integrated design and analytical skills. Focuses on large and small scale elements that can become generative and performative aspects of major design decisions.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 377 [Min Grade: C-]

ARCH 379 Architectural Technology IX 3.0 Credits
Advanced building technology design and analysis is utilized in iterative
and integrated design methods to support comprehensive design
processes. Materials, structure and systems are developed qualitatively
and quantitatively through design and analysis exercises.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 378 [Min Grade: C-]

ARCH 381 Architecture Studio 3A 4.0 Credits
Investigates the design relationship between man-made and the natural
environment. Cultivates advanced analysis methods and the development
of informed and resolved design solutions.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 283 [Min Grade: C-] and ARCH 226 [Min Grade:
C-] and ARCH 173 [Min Grade: C-] or (ARCH 223 [Min Grade: C-] and
ARCH 253 [Min Grade: C-])

ARCH 382 Architecture Studio 3B 4.0 Credits
Studies the relationship between building, site and context. Architectural
design problems emphasize concept development that translates careful
analysis into the building ideas with a progressing understanding of
architectural concerns.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 381 [Min Grade: C-] and ARCH 274 [Min Grade:
C-] or (ARCH 291 [Min Grade: C-] and ARCH 354 [Min Grade: C-])

ARCH 383 Architecture Studio 3C 4.0 Credits
Focuses on architectural problems with intermediate complexity.
Integrates issues of context, site, program, function, and architectural
systems into advanced design proposals.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 382 [Min Grade: C-] and ARCH 275 [Min Grade:
C-] or (ARCH 292 [Min Grade: C-] and ARCH 355 [Min Grade: C-])

ARCH 394 Building Systems IV 1.5 Credit
Intermediate study of architectural technology with a focus on design
impacts and analysis related to mechanical systems within the context of
building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 276 [Min Grade: C-] or ARCH 293 [Min Grade: C-]

ARCH 395 Building Systems V 1.5 Credit
Intermediate study of architectural technology with a focus on
design impacts and analysis related to acoustical design and energy
consumption within the context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 394 [Min Grade: C-]

ARCH 396 Building Systems VI 1.5 Credit
Intermediate study of architectural technology with a focus on design
impacts and analysis related to lighting and electrical systems within the
context of building design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 395 [Min Grade: C-]

**ARCH 421 [WI] Environmental Psychology and Design Theory 3.0
Credits**
Examines the relationship between human behavior and architecture from
the perspective of environmental psychology. Topics include aesthetics,
environmental experience, social interaction, social organization, and
culture. This is a writing intensive course. History/Theory Elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 431 [WI] Architectural Programming 3.0 Credits
Introduces current techniques of building programming and their
relationship to building design. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 353 [Min Grade: C-] or ARCH 483 [Min Grade: C-]

ARCH 432 The Development Process 3.0 Credits
Introduces the process of land development. Explores traditional and
emerging development models (the architect as the equity participant
and developer) in relation to new construction and rehabilitation. Covers
various methods of initiating building projects and financing and tax
issues. Professional elective. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARCH 441 Urban Design Seminar 3.0 Credits
Expands the concept of architecture to urban design scale and presents
the principles of city planning through a series of case studies. History/
Theory Elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 143 [Min Grade: C-] or ARCH 144 [Min Grade: C-]

ARCH 451 Advanced Drawing 3.0 Credits
Covers advanced architectural rendering, concentrating on the effects
of light, shade, and color using the techniques of water-color rendering.
Professional elective. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 226 [Min Grade: C-] or INTR 341 [Min Grade: C-]

ARCH 455 Computer Applications in Architecture I 3.0 Credits
Covers two-dimensional and three-dimensional computer representations
and applications. Professional elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 226 [Min Grade: C-]

ARCH 456 Computer Applications in Architecture II 3.0 Credits
Further investigates and demonstrates the computer's capabilities in
architectural design and representation. Professional elective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 226 [Min Grade: C-]

ARCH 463 Emerging Architectural Technology 3.0 Credits
A holistic study of design and construction technology of significant
buildings by leading architects.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 161 [Min Grade: C-] or ARCH 173 [Min Grade: C-]
or ARCH 253 [Min Grade: C-]

ARCH 464 Building Enclosure Design 3.0 Credits
Examines the integrations of aesthetics, building science, and technology
in the design of building enclosures. Professional Elective. Summer.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: or ARCH 173 [Min Grade: C-] or ARCH 253 [Min Grade:
C-]

ARCH 465 Energy and Architecture 3.0 Credits
Creates an awareness of the availability of energy resources and their
effect on the built environment. Discusses alternative sources of energy.
Professional elective. Summer.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 173 [Min Grade: C-] or ARCH 253 [Min Grade: C-]

ARCH 481 Architecture Studio 4A 4.0 Credits
Focuses on more complex architectural challenges through analysis of
case studies that address the relationship between the man-made built
environment and the natural environment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 383 [Min Grade: C-] and ARCH 276 [Min Grade:
C-] or (ARCH 356 [Min Grade: C-] and ARCH 293 [Min Grade: C-])

ARCH 482 Architecture Studio 4B 4.0 Credits
Furthers the understanding of context and design and the application
of solutions and strategies surrounding more complex architectural and
environmental problems.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 481 [Min Grade: C-] and ARCH 377 [Min Grade:
C-] or (ARCH 324 [Min Grade: C-] and ARCH 394 [Min Grade: C-])

ARCH 483 Architecture Studio 4C 4.0 Credits
Challenges to develop and refine architectural solutions through an
advanced understanding of the relationship between buildings and
environment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 482 [Min Grade: C-] and ARCH 378 [Min Grade:
C-] or (ARCH 325 [Min Grade: C-] and ARCH 395 [Min Grade: C-])

ARCH 487 Architecture Studio 5A 4.0 Credits
Addresses the complex relationship through analysis and synthesis of
form, site, program, building technology and theory within specific building
context.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 483 [Min Grade: C-] and ARCH 379 [Min Grade:
C-] or (ARCH 326 [Min Grade: C-] and ARCH 356 [Min Grade: C-] and
ARCH 396 [Min Grade: C-])

ARCH 488 Architecture Studio 5B 4.0 Credits
Emphasizes complex architectural problems while demonstrating
understanding and appropriate application.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 487 [Min Grade: C-]

ARCH 489 Architecture Studio 5C 4.0 Credits
Integrates in-depth application and coordination of all architectural
building criteria in a large scale and complex architectural problem.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 488 [Min Grade: C-]

ARCH 493 Senior Project I 4.0 Credits
Students develop a three-term capstone design project to pursue and
explore architectural concepts in depth. Students take a project from
concept, research, programming to complete design development. Part
one of three.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: (ARCH 363 [Min Grade: C-] or ARCH 489 [Min Grade: C-])
and ARCH 431 [Min Grade: C-]

ARCH 494 Senior Project II 4.0 Credits
Students develop a three-term capstone design project to pursue and
explore architectural concepts in depth. Students take a project from
concept, research, programming to complete design development. Part
two of three.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 493 [Min Grade: C-]

ARCH 495 Senior Project III 4.0 Credits
Students develop a three-term capstone design project to pursue and explore architectural concepts in depth. Students take a project from concept, research, programming to complete design development. Part three of three.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 494 [Min Grade: C-]

ARCH 496 Thesis I 8.0 Credits
An individually structured year-long design problem that enables students to work independently and explore complex issues in depth. Periodic individual review sessions are scheduled with faculty adviser. Fall.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH.
Prerequisites: ARCH 363 [Min Grade: D] and ARCH 143 [Min Grade: C-] and (ARCH 134 [Min Grade: C-] or ARCH 153 [Min Grade: C-] or ARCH 226 [Min Grade: C-]) and (ARCH 263 [Min Grade: C-] and ARCH 273 [Min Grade: C-]) or ARCH 379 [Min Grade: C-]

ARCH 497 Thesis II 8.0 Credits
Continues ARCH 496. Winter.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 496 [Min Grade: C-]

ARCH 498 Thesis III 8.0 Credits
Continues ARCH 497. Spring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARCH 497 [Min Grade: C-]

ARCH I199 Independent Study in Architecture 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH I299 Independent Study in Architecture 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH I399 Independent Study in Architecture 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH I499 Independent Study in Architecture 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ARCH 143 [Min Grade: C]

ARCH T180 Special Topics in Architecture 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH T280 Special Topics in Architecture 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH T380 Special Topics in Architecture 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARCH T480 Special Topics in Architecture 1.0-6.0 Credit
Covers special topics in architectural history, theory, or technology that satisfy history/theory or professional elective requirements.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ARCH 143 [Min Grade: C]

Art History

Courses

ARTH 101 History of Art I: Ancient to Medieval 3.0 Credits
Traces the rise of Western civilization from ancient Egypt and Mesopotamia, through Greek and Roman culture to the late Middle Ages, with an emphasis on the evolution of style and symbolism in art.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 102 History of Art II: Renaissance to Romanticism 3.0 Credits
Surveys painting and sculpture created between the 15th century and the mid-19th century, placing artists such as Donatello, Michelangelo, Rubens, and Rembrandt in the context of the evolution of style and symbolism in Western culture.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 103 History of Art III: Modern Art 3.0 Credits
Examines the history of modern painting and sculpture from 1850 to the present and the phenomenon of Modernism in terms of individual artists, movements, attitudes, and values. Movements to be covered include Impressionism, Symbolism, Expressionism, Cubism, Surrealism, Non-figurative Abstraction, the New York School, and Postmodernism.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 150 Art History Research Methods 3.0 Credits
This course introduces students to research methods that guide the physical, contextual and interpretive analysis of objects categorized by design and/or use as "works of art." Students will learn how to identify materials and media, as well as how to conduct archival and library research. From these foundations, students will explore the circumstances of artifact production and function as well as histories of excavation and/or preservation, documentation, display and interpretation. The course includes mandatory on-campus and off-campus field trips. Students will gain valuable skills that may be required for co-ops in museums or galleries as well as to honing their skills for writing research papers.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARTH 101 [Min Grade: B-], ARTH 102 [Min Grade: B-], ARTH 103 [Min Grade: B-] (Can be taken Concurrently)

ARTH 200 Principles and Methods of Art History 3.0 Credits
This course will critically examine the interpretive principles and methods that have been used in the discourse of art history from the Renaissance to the present day.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 300 [WI] History of Modern Design 3.0 Credits
Examines the products of applied design during the past 150 years, including examples of furnishings, industrial design, fashion, and graphic design, in relation to demand, technology and production, standards, fine art, social reform, and the dynamics of consumption. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ARTH 301 Asian Art and Culture 3.0 Credits
Explores the diverse visual languages and cultures of Asia including the Buddhist and Hindu traditions from India and Southeast Asia, the imperial art of China with its refined taste for ceramics and painting, and the Japanese.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 302 Art of India 3.0 Credits
This course explores the diverse artistic traditions of the Indian subcontinent from ancient times to the modern period, focusing on the art of the Buddhist, Hindu and Islamic communities. The survey ends with an examination of the colonial, post-colonial and contemporary art scene.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 303 Art of China 3.0 Credits
From the first empires to modern times, this course explores the art of painting ceramics, as well as the sculptural and architectural traditions of China.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 304 Art of Japan 3.0 Credits
This course examines the art of Japan from the Shinto traditional forms to the creation of a Buddhist Japanese idiom, from the courtly and military art to the Zen aesthetics and the establishment of a modern urban culture.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 310 Early American Art 3.0 Credits
This course will survey paintings, sculpture, graphic arts, and material culture of North America from the moment of Columbus's "discovery" to the mid-nineteenth century. It will trace a wide range of artistic and visual works from the Colonial, Federal and Antebellum periods, including some works that were made during and after the Civil War. Along with the study of art emerging out of a European tradition, we will simultaneously be studying the art and culture of the indigenous peoples of Latin and North America, paying special attention to the interactions between indigenous and immigrant visual cultures.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 311 Twentieth-Century American Art 3.0 Credits
This course tracks the development of select artistic movements and the careers of notable American artists, from 1900-1939. This course will study the impact of immigration, WWI, industrialization and mechanization, urbanization, economic crisis, and radical politics on American art, and also how American art contributed to the production of specific racial, classed, and gendered American subjects.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 312 Early Modernism (1850-1900) 3.0 Credits
This course is an introduction to European art of the late nineteenth century, from roughly 1850 to 1900—the decades when modernism exploded. Beginning with a close look at the Realist and Impressionist movements in Paris, we will study the artistic styles, techniques, and materials characteristic of the modern era, as well as the changing social, historical and political circumstances that helped shaped artistic production.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 313 20th Century Modernism (1900-1955) 3.0 Credits
This course will critically examine the development of Modernism in Western art during the first half of the 20th century in light of socio-economic and political factors, philosophical and scientific ideas, technological developments, stylistic movements, and art theories.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 314 Contemporary Art 3.0 Credits
This course will survey current global art production in light of socio-economic and political factors, philosophical and scientific theories, and new approaches to media and technology.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 315 History of African-American Art 3.0 Credits
This course traces the history of African American art, beginning with the African-inspired material culture of slaves, and, later, encompassing the works of formally-trained as well as self-taught painters, sculptors, photographers, and artists working in multimedia up to the present. These works will be situated within the contexts of critical race theory, social and political movements, collectors and patrons, early critics and theorists of the black avant garde, influential exhibitions, and the opposition between elite and popular cultures.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 316 African Art 3.0 Credits
This course will explore historical and contemporary African sculpture, textiles, painting, drawing, photography and mixed media in relationship to particular themes such as religion, trade, political power and healing. With emphasis on select objects from West and Central Africa, the course will also consider the visual arts in relationship to ideas of improvisation, aesthetics, identity and self-representation.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 317 Modern Art Theory and Criticism 3.0 Credits
This course will critically examine the development of art theory and criticism in the discourse of Western art from the early 20th century to the present day. Specific theories will be analyzed in relation to stylistic developments as well as the socio-economic, political, scientific, and technological developments that have determined these changes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 320 Art in the Age of Technology 3.0 Credits
An inquiry into the ideas, concerns, and values that constitute the worldview of modern Western science and technology and the impact that this view, as well as specific technologies, have had upon the visual arts.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 325 Ancient Greek and Roman Art 3.0 Credits
This course will survey the art produced by the ancient cultures of Greece and Rome, from the archaic period to the fall of the Roman Empire. The art will be considered as an expression of the social, political, economic and intellectual histories of these two civilizations.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 326 Medieval Art 3.0 Credits
This course is a survey of Medieval Art between the 3rd and 14th centuries C.E.. Architecture, mural painting, stained glass, sculpture, illuminated manuscripts, enamel, tapestry and other objects of ceremonial and everyday use will be studied as expressions of the political, social, and religious contexts of the time. Emphasis will be placed upon Christian art, but Islamic, Jewish, and secular traditions in the arts will also be examined.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 327 Italian Renaissance Art 3.0 Credits
This course will survey paintings, sculpture, architecture and graphic art from Italy during the 15th and 16th centuries. Artworks will be analyzed not only in terms of their formal characteristics, but also as expressions of concurrent social, political, economic, religious, and philosophical developments.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 328 Northern Renaissance 3.0 Credits
This course will survey paintings, sculpture, and graphic arts from Northern Europe during the 15th and 16th centuries. Artworks will be analyzed not only in terms of their formal characteristics, but also as expressions of concurrent social, political, economic, religious, and philosophical developments.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 329 Art of the 17th and 18th Centuries 3.0 Credits
This course will examine the history of European art and architecture from the late 1500s to approximately 1800—a period that bridges the gap from the Renaissance to the earliest days of the Modern era. Beginning with the Baroque in Counter-Reformation Italy and concluding with Neoclassicism in the late 18th century, the course will trace the stylistic developments in Europe and America through a variety of religious, political, and philosophical movements.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 335 [WI] History of Costume I: Preclassical to Directoire 3.0 Credits
Examines costumes of the ancient world and Western civilization through the Directoire period, including political, economic, and social influence on aesthetic development in dress. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ARTH 101 [Min Grade: D] or ARTH 102 [Min Grade: D]

ARTH 336 [WI] History of Costume II: Directoire to World War I 3.0 Credits
Examines political, social, and economic influences on costume. Uses the Drexel Historic Costume collection as primary source material. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ARTH 335 [Min Grade: D]

ARTH 337 History of Costume: Post World War I to Present 3.0 Credits
Examines major trends in mid-to-late 20th-century fashionable apparel in their sociocultural, political, and economic contexts. Also examines counter-fashion movements and explores current media and marketing influences.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ARTH 103 [Min Grade: D]

ARTH 340 Women in Art 3.0 Credits
A historical survey of the art created by women in Western civilization, with a special focus upon the art created since the women's movement of the 1970s. Images are analyzed in relation to the sociopolitical and psychological context of Western, patriarchal culture.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 356 Understanding Museum Audiences 3.0 Credits
This course will introduce students to the variety of ways that museums think about their diverse audiences and the programs that they develop to meet audience needs. Our society is changing. Learning is no longer confined to the classroom and museums have become an important resource for this lifelong, self-directed learning. This course will introduce students to educational theory, research and practice in museums. Students will experience different techniques for teaching with and interpreting art in the museum setting.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 400 Art History Senior Thesis 3.0 Credits
A scholarly research project written during the senior year under the advisement of a thesis director chosen from among the art history faculty. The thesis student will meet at least once every week with the advisor who will provide direction for their research by helping them to develop a topic, identify appropriate resources, discuss interpretive strategies, determine the expository structure of the paper, and provide clarity on specific requirements for bibliography, illustrations, and a citation system.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

ARTH 477 Art History Seminar 3.0 Credits
Provides reading, discussion, and research on pertinent topics in art history.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if classification is Junior or Senior.

ARTH I199 Independent Study in Art History 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARTH I299 Independent Study in Art History 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARTH I399 Independent Study in Art History 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARTH I499 Independent Study in Art History 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARTH T180 Special Topics in Art History 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARTH T280 Special Topics in Art History 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARTH T380 Special Topics in Art History 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

ARTH T480 Special Topics in Art History 3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Arts & Sciences-Interdisp Stud

Courses

AS-I 100 Community-Engaged Learning 1.0-4.0 Credit
AS-I 100 is a recitation that will be offered in conjunction with an academic community-based course, where students will be engaged in and with the community as part of the course. Students registered for the primary course will add AS-I 100 as a co-requisite recitation for which they will work within the community setting for a number of hours each week. As not every primary course is taught as community-based, this recitation will be added only when appropriate. Students will be informed of the need to add this course.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

AS-I 101 Strategies for Online Learning 3.0 Credits
This course provides an introduction to Drexel University and online learning and is designed for online students. This course will provide students with strategies and skills necessary for successful online learning experiences. Topics covered will include communication, time management, citation, plagiarism as well as Drexel specific skills including how to navigate the library, how to register for classes and how to monitor degree progress. Acquisition of these skills will set the stage for a successful online learning experience.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is COMM or major is PSY.

AS-I 103 AIDS 101 3.0 Credits
Offers a multidisciplinary approach to studying the aids epidemic. Includes service-learning as a means of understanding and affecting the epidemic.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

AS-I 180 Interdisciplinary Study in the Arts & Sciences 1.0-3.0 Credit
Designed for courses that offer a multidisciplinary approach to the study of issues and topics in the Arts and Sciences.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 9 credits

AS-I 265 Special Interdisciplinary Study in Arts & Sciences 0.5-6.0 Credits
Special interdisciplinary studies in the College of Arts and Sciences.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

AS-I T180 Special Topic in Arts & Sciences-Interdisp Stud 0.0-12.0 Credits
Special topics in Arts and Sciences interdisciplinary studies.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

AS-I T280 Special Topic in Arts & Sciences-Interdisp Stud 0.0-12.0 Credits
Special topics in Arts and Sciences interdisciplinary studies.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

AS-I T380 Special Topic in Arts & Sciences-Interdisp Stud 0.0-12.0 Credits
Special topics in Arts and Sciences interdisciplinary studies.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

AS-I T480 Special Topic in Arts & Sciences-Interdisp Stud 0.0-12.0 Credits
Special topics in Arts and Sciences interdisciplinary studies.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Behavioral & Addictions Couns

Courses

BACS 100 Life Span Human Development 3.0 Credits
This course introduces students to the physical, cognitive and psychological aspects of human development from birth through advanced old age. Topics include: environmental influences, perception, gender roles and sexuality, spirituality, motivation, life styles, and psychiatric disorders.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 200 Foundation of Behavioral Health Care 3.0 Credits
This course introduces the students to the historical and current contexts of program components that comprise community-based behavioral health systems. Topics include: work-force roles; regulatory policies and program practices; federal, state, and county program organizations; advocacy issues; and managed care systems issues.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D], ENGL 111 [Min Grade: D], ENGL 102 [Min Grade: D], ENGL 112 [Min Grade: D], ENGL 103 [Min Grade: D], ENGL 113 [Min Grade: D] (Can be taken Concurrently)

BACS 205 Strategies for Academic Success 1.0 Credit
This course helps students to explore the learning process, to gain essential skills needed to achieve academic success and to develop the ability to make effective use of university resources. Discussion, personal reflection, and relevant electronic resources are used to foster students' development as self-directed learners. Specific attention will be given to the following topics: study skills, learning strategies, time management, academic planning, test-taking techniques, and goal-setting. The goal of this course is to help improve students' efficacy in the areas of academic self-management, self-direction, and resource utilization.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 210 Behavioral Disorders 3.0 Credits
Clinical characteristics and diagnostic features of major psychiatric disorders are reviewed within the contexts of community-based treatment approaches. Topics include: etiological models, differential symptoms, diagnostic/functional assessment and treatment interventions.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 220 Counseling Theory and Practice 3.0 Credits
Surveys major counseling theories with emphasis upon study and practice of basic counseling competencies. Topics include: relationship building, effective communication and helping skills, common stages in counseling process, and helping skills with special populations.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 230 Genetics and Mental Health 3.0 Credits
This course explores genetic concepts and principles as they pertain to human variation in behavioral and general health disorders. Students obtain a firm grounding in the basic science and the tools used by researchers to explore the contribution of the genes (and their essential counterpart, the environment) to behavior.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 232 Ethics and Professional Responsibility 3.0 Credits
This course discusses the philosophical, legal and moral responsibilities of professionals in behavioral health and human services setting with a strong emphasis on counseling relationships. A wide array of ethical issues are presented and discussed. Moral dilemmas comprised of competing moral obligations are examined.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 234 Introduction to Addictive Disorders 3.0 Credits
This course introduces the nature of addictions and the impairment in individuals who suffer from addictions. It includes a review of theories on substance disorders and approaches to identification, prevention and treatment. Topics include: historical perspectives, diagnosis, types of addictive behaviors, treatment, and current research.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 236 [WI] Psychiatric Rehabilitation Principles and Practices 3.0 Credits
This is an introductory course which orients the student to the principles and practices of Psychiatric Rehabilitation. It provides the student with an understanding of the manner in which Psychiatric Rehabilitation approaches, understands and assists people with serious mental illnesses. The course also surveys the service settings where this practice is applied.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D], ENGL 111 [Min Grade: D], ENGL 102 [Min Grade: D], ENGL 112 [Min Grade: D], ENGL 103 [Min Grade: D], ENGL 113 [Min Grade: D] (Can be taken Concurrently)

BACS 250 Behavioral Health Informatics 3.0 Credits
This course introduces students to the uses and importance of computer technologies in transforming behavioral health care practice. Course sections cover both the science and practice applications of emerging technologies from psychotherapies, to medication management, and to quality care management.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 255 Multicultural Counseling 3.0 Credits
This course provides information and practice opportunities for developing cultural competence and socially just practices in behavioral health. Students will develop awareness and skills necessary for establishing therapeutic relationships with clients of diverse cultural backgrounds.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: BACS 220 [Min Grade: D] (Can be taken Concurrently)

BACS 301 Group Counseling I 3.0 Credits
This course is an introduction to the theoretical base and skills used in conducting group counseling. Included are theories of group work, facilitation techniques, types and styles of groups and models of group functioning. Students participate in a group as a group member and to act as a group co-leader in order to practice leadership skills.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: BACS 220 [Min Grade: D] (Can be taken Concurrently)

BACS 304 Cognitive and Behavioral Counseling I 3.0 Credits
This course familiarizes the student with key cognitive-behavioral models used in therapy today. Differences and similarities are explored. Students are exposed to the philosophical models and the related techniques stemming from these models. Skills on how to conceptualize and work with a client are taught.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: BACS 220 [Min Grade: D] (Can be taken Concurrently)

BACS 310 Recovery and Relapse Prevention 3.0 Credits
The goal of recovery and relapse preventions is the development personal strategies that will help the person restructure their life in a way that will prevent a return to active addiction. This course helps define the role of professional counselor in understanding the dynamic of recovery from a clinical perspective.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 312 Case Management Methods 3.0 Credits
This course is an in-depth explorations of the definitions and methodologies of case management services. The course is designed to provide students with the most up to date research and clinical applications of services management in the practice of addictions counseling.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 320 Crisis and Brief Intervention 3.0 Credits
This course introduces student to the fundamental concepts, theories, strategies, and skills needed to understand and conduct effective crisis and brief intervention counseling. Particular attention is given to several types of crises commonly encountered in working within settings serving people who have long-term disabling psychiatric disorders.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 325 Psychopharmacology for Counselors 3.0 Credits
This course focuses on the mechanisms of action of psychiatric medications, and uses and limitations of psychopharmacology in the overall management of serious mental illness. The student will learn to work collaboratively with the consumer, and others, and the importance of integrating the use of medications with psychiatric rehabilitation approaches.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 345 Careers in Behavioral Health 3.0 Credits
There are numerous career choices available within the field of Behavioral Health. In order to help you prepare for the future, this course explores the roles, responsibilities, and healthcare settings associated with careers such as counselor, psychiatric rehabilitation practitioner, social worker, therapist, psychologist, psychiatrist, advocate, and others. We explore opportunities to work with children, adults, and seniors in hospital and community treatments settings as well as in schools and in the community at large. We also examine the educational requirements of different fields of professional practice and review graduate schools options. Students explore their strengths and preferences related to future employment and begin to formulate personal plans for academic and professional success.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 350 Child Psychopathology 3.0 Credits
This course provides an understanding of childhood-onset behavioral, emotional, developmental, and learning disorders. Review of theories on the development of child psychopathology and approaches to identification, prevention and treatment of disorders. Students learn about assessment and ethical treatment of children.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 360 Preventing Substance Abuse 3.0 Credits
This course provides a comprehensive overview of prevention theories and prevention programming applications as regards substance use disorders. Course topics include: theories and models basic to prevention, science-based prevention strategies and model programs, strategic planning and outcome evaluation.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 367 Advanced Counseling Intervention 3.0 Credits
This course introduces students to current best practices when counseling clients with behavioral health disorders. Students are provided with training in the advanced counseling skills of Motivational Interviewing and Solution-Focused Therapy as well as introduced to experimental approaches to counseling this population.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: BACS 220 [Min Grade: C]

BACS 368 Addictions Counseling with Special Populations 3.0 Credits
This course involves the student in examinations of challenges for addictions counselors in working with frequently underserved populations represented by adolescents and elderly persons. Effective approaches to assessing and treating both youthful and older adult individuals with addiction disorders are explored and defined.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 370 Problem Gambling Interventions 3.0 Credits
This course covers basic areas of treatment knowledge and counseling skills necessary to effectively diagnose and assess the pathological gambler and define the necessary components for effective counseling interventions with problem gamblers.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 380 Trauma-Informed Care 3.0 Credits
This is an introduction to the psychophysiology of complex trauma in children and adolescents, and an overview of assessment and treatment modalities in both youth and adults. The course focuses on neurobiology and how trauma impairs brain development and the life domains of children, adolescents, and adults. It also covers various issues of assessment, diagnosis, and treatment. The stages of stabilization, reprocessing and reintegration, and the multiple models helpers utilize when working with survivors of trauma are explored. Course work will culminate with students reviewing and presenting case studies of assessment and treatment interventions for children and adolescents experiencing traumatic effects.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 390 Special Topics in Mental Health 3.0 Credits
This course covers topics of particular interest to students in health sciences. In different terms, a variety of topics will be presented to the students. May be repeated twice for credit.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 2 times for 6 credits

BACS 401 Assessment and Treatment Planning 3.0 Credits
The focus of this course is learning the systematic, multi-disciplinary approach for gathering, interpreting, applying and recording data regarding clients in addictions and other behavioral health treatment settings. The most current screening, assessment, treatment planning and documentation approaches are covered.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: BACS 220 [Min Grade: D] (Can be taken Concurrently)

BACS 404 Cognitive and Behavioral Counseling II 3.0 Credits
This course extends BACS 304 by deepening the exploration of cognitive-behavioral therapy theory and methods. More emphasis and developing skills in conceptualization and treatment. Some focus on how clients can manage anger better and how therapists can take care of themselves appropriately.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: BACS 304 [Min Grade: C]

BACS 405 Family-Focused Interventions 3.0 Credits
This course gives students the knowledge, skills and attitudes to: identify and overcome the barriers that prevent family members from being full partners in the mental health treatment of their family member; define family from a culturally competent perspective; and provide mental health intervention in full partnership with families.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 410 Child and Adolescent Support 3.0 Credits
This course is based on the principles of Child and Adolescent Service System Program (CASSP). The course gives students the knowledge, skills important to implementing a comprehensive care system for families and their children endorsed by the Commonwealth of Pennsylvania.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 411 Forensic Behavior Health Service 3.0 Credits
The intersection between law and behavioral health services in the focus of this course. Topics include: the criminal justice system, criminal thinking, community and ethical barriers, biopsychosocial models that are specific to the forensic client and the growing base of knowledge about community corrections.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 412 Group Counseling II 3.0 Credits
This is an advanced course in the facilitation of group processes, with an emphasis on group counseling. The course provide skills in group facilitation including application of theory, tracking process and initiating interventions, working with special populations, incident management, treatment planning processes, and recording progress.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: BACS 301 [Min Grade: C] (Can be taken Concurrently)

BACS 414 Co-Occurring Disorders 3.0 Credits
This course introduces an integrated treatment approach for working with individuals who have both mental illness and substance use disorders. Topics include: assessment and treatment planning, strategies for coordinating dual interventions.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 420 Psychiatric Rehabilitation Competencies 3.0 Credits
The purpose of this advanced course is to help students develop the competencies necessary to implement the principles and practices of Psychiatric Rehabilitation. This is accomplished by engaging the student in an in-depth analysis of the tools and processes used to bring about outcomes related to community integration and the life quality.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 430 Behavioral Health and Aging 3.0 Credits
Students will explore concepts, issues, and research pertaining to the psycho-social and behavioral health aspects of working with older adults. Students will learn about and practice interventions, competencies, and strategies designed to improve the quality of life of older adults.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

BACS 490 Senior Research Project 3.0 Credits
The students, with faculty supervision, plan and execute a term project that will integrate the academic and practical knowledge the students have acquired in their curriculum. The students develop objectives relevant to the project, critique the literature, present a plan for implementation, and complete the term project. May be repeated twice for credit.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 2 times for 6 credits

BACS 499 Readings in Behavioral Health 1.0-6.0 Credit
This course is designed to allow upper-class students to pursue specialized interest in specific topics in behavioral health science. May be repeated three times for credit.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 3 times for 9 credits

Biomedical Engineering & Sci

Courses

BMES 101 Introduction to BMES Design I – Defining Medical Problems 2.0 Credits
This course is part one in a two-part series meant to instruct students on the unique challenges of designing solutions for biomedical needs. Part one will focus on defining the problem which includes: 1) understanding the medical need, 2) evaluating existing solutions, 3) defining requirements, identifying constraints and 4) choosing tests to verify requirements have been met.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit

BMES 102 Introduction to BMES Design II – Evaluating Design Solutions 2.0 Credits
This course is part two in a two-part series meant to instruct students on the unique challenges in designing solutions for biomedical needs. Part two will focus on developing solutions that include: 1) generating multiple solution pathways, 2) refining solution choices based on requirements and constraints, 3) conducting experimental verification tests and 4) finally concluding if the solution was a success.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: BMES 101 [Min Grade: D]

BMES 124 Biomedical Engineering Freshman Seminar I 2.0 Credits
This course is intended to introduce freshman biomedical engineering students in the School of biomedical Engineering, Science and Health Systems at Drexel University to academic programs and opportunities, ongoing research projects and University resources to ensure a successful educational experience at Drexel and beyond. Through class discussions and guest lecture presentations, the students are provided with information and contacts necessary to begin a plan of academic study.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit

BMES 125 Foundations of Biomedical Engineering 2.0 Credits
This course is intended to introduce new transfer biomedical engineering students in the School of biomedical Engineering, Science and Health Systems at Drexel University academic programs and opportunities, ongoing research projects and University resources to ensure a successful educational experience at Drexel and beyond. Through class discussions and guest lecture presentations, the students are provided with information and contact necessary to begin a plan of academic study.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit

BMES 126 Biomedical Engineering Freshman Seminar II 1.0 Credit
This course is intended to introduce freshman biomedical engineering students to the career embodied by the School's current concentration areas. Each area will be discussed in terms of the current state of the art, research possibilities and career opportunities. The curricula for each concentration will be discussed in detail so as to facilitate students' knowledge of how each curriculum relates to the research and employment opportunities in that field.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit

BMES 130 Problem Solving in Biomedical Engineering 2.0 Credits
This course integrates fundamental principles of biology, chemistry, engineering, mathematics and physics into a framework for the study of biomedical engineering. In this course, students will use both engineering and scientific approaches to problem-solving. They will learn about the differences between engineering design and biological evolution. They will also learn to apply basic principles of chemistry, physics and mathematics to specific biological and physiological problems.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit

BMES 201 Programming and Modeling for Biomedical Engineers I 3.0 Credits
This course aims to introduce students with some fundamental concepts about programming in MATLAB to give the ability to solve basic bioengineering problems. The course introduces the basics of programming using Matlab, including programming environment and tools. Fundamental programming techniques and concepts such as loops, switches and logical operators, functions and file handling are covered. Applications in bioengineering for basic numerical problem solving are discussed.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit

BMES 202 Programming and Modeling for Biomedical Engineers II 3.0 Credits
The course aims to introduce students to advanced programming concepts and tools to solve numerical problems in bioengineering. It provides the foundation for biosimulation and biocomputation classes. This course introduces advanced programming methods and computational tools for numerical analysis, model design and graphics. Higher level level lunctionality in Matlab such as SIMULINK, symbolic processing and CAD related tools are discussed.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: BMES 201 [Min Grade: D]

BMES 212 The Body Synthetic 3.0 Credits
The Body Synthetic introduces concepts underlying biological and engineering principles involved in the design and construction of prosthetic devices used to replace various parts of the human body.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: BIO 122 [Min Grade: D]

BMES 235 Living Systems Engineering 4.0 Credits
This course introduces the biomedical engineering students to engineering principles applied to biological and physiological systems. This course focuses on evolution, adaptation, energy, thermodynamics, fluid dynamics and control systems in living organisms.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: BIO 122 [Min Grade: D] and CHEM 102 [Min Grade: D] and MATH 200 [Min Grade: D] and PHYS 102 [Min Grade: D] and BIO 201 [Min Grade: D]

BMES 238 Dynamics of Biomedical Systems 3.0 Credits
Covers kinematic (linear and angular momentum) and kinetic (forces and moments) analysis of biomedical systems in two and three dimensional space with rotating coordinate systems.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: MATH 201 [Min Grade: D], ENGR 231 [Min Grade: D], MATH 261 [Min Grade: D] (Can be taken Concurrently)MEM 202 [Min Grade: D]

BMES 241 Modeling in Biomedical Design I 2.0 Credits
This course is part 1 in a 2 part series meant to instruct students on how to leverage year appropriate skills while designing solutions to biomedical problems. Students will: a) evaluate mathematical model(s) meant to solve biomedical problem(s), b) write software to simulate these solution(s), c) construct a solution based on simulation specifications, d) employ laboratory standards to verification testing, e) review test results and propose further refinement (written document and oral presentation).
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: MATH 200 [Min Grade: D] and PHYS 102 [Min Grade: D] and BIO 122 [Min Grade: D] and BMES 201 [Min Grade: D] and (BMES 102 [Min Grade: D] or ENGR 103 [Min Grade: D])

BMES 301 Laboratory I: Experimental Biomechanics 2.0 Credits
This course deals with experimental aspects of biomechanics, specifically with the testing mechanical properties of biological tissues.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (MATH 201 [Min Grade: D] or MATH 261 [Min Grade: D] or ENGR 231 [Min Grade: D]) and MEM 202 [Min Grade: D]

BMES 302 Laboratory II: Biomeasurements 2.0 Credits
This course introduces students to the measurement of physiological/biological/functional signals. Four specific signals will be collected and analyzed. Students are expected to analyze type of signal to be collected, possible measurement techniques and potential data analysis and then collect and analyze each signal.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: ECE 201 [Min Grade: D] (Can be taken Concurrently)BIO 201 [Min Grade: D]

BMES 303 Laboratory III: Biomedical Electronics 2.0 Credits
This course introduces students to the widespread application of
electronics and electronic devices in biomedical engineering. The course
reinforces concepts learned in ECE 201 with hands-on experimentation
related to biomedical applications such as telemedicine and medical
devices.
College/Department: School of Biomedical Engineering, Science Health
Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECE 201 [Min Grade: D] and (MATH 210 [Min Grade: D]
or ENGR 232 [Min Grade: D] or MATH 262 [Min Grade: D])

BMES 304 Laboratory IV: Ultrasound Images 2.0 Credits
This course introduces students to the engineering principles of acoustical
measurements by combining hands-on laboratory experiences with
lectures. Students will learn the engineering/physical principles of
measuring sound velocity in different materials, attenuation, and directivity
of a circular transducers.
College/Department: School of Biomedical Engineering, Science Health
Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: BIO 201 [Min Grade: D] and ECE 201 [Min Grade: D]

**BMES 305 Laboratory V: Musculoskeletal Anatomy for Biomedical
Engineers 2.0 Credits**
This course provides an opportunity for students to study the anatomy and
biomechanics of select articulations of the human body. While the main
emphasis will be on the musculoskeletal structures associated with each
articulation, major neural and vascular structures will be studied as well.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: (BIO 201 [Min Grade: D] or BMES 235 [Min Grade: D])
and MEM 202 [Min Grade: D]

BMES 310 Biomedical Statistics 4.0 Credits
This course is designed to introduce biomedical engineering students
to the fundamentals of biostatistics necessary for medical research.
Topics covered include measurements, sampling, basic hypothesis
testing, analysis of variance and regression. Medical applications are
emphasized.
College/Department: School of Biomedical Engineering, Science Health
Systems
Repeat Status: Not repeatable for credit
Prerequisites: ENGR 231 [Min Grade: D] or MATH 261 [Min Grade: D] or
MATH 201 [Min Grade: D]

BMES 315 Experimental Design in Biomedical Research 4.0 Credits
This course is designed to introduce students to the fundamental
principles of experimental design and statistical analysis as applied to
biomedical research with animals and humans. Topics to be covered
include experimental design, clinical design, and protocol submission and
review.
College/Department: School of Biomedical Engineering, Science Health
Systems
Repeat Status: Not repeatable for credit
Prerequisites: BMES 310 [Min Grade: D]

BMES 325 Principles of Biomedical Engineering I 3.0 Credits
This course is the first part of a two-term sequence which introduces
biomedical engineering students to engineering principles applied to
biological and physiological systems. This course focuses on bioethical
questions, biomechanics, human performance engineering, biomaterials
and tissue engineering.
College/Department: School of Biomedical Engineering, Science Health
Systems
Repeat Status: Not repeatable for credit
Prerequisites: MEM 202 [Min Grade: D] (Can be taken Concurrently)BIO
122 [Min Grade: D] and (ENGR 232 [Min Grade: D] or MATH 262 [Min
Grade: D] or MATH 210 [Min Grade: D])

BMES 326 Principles of Biomedical Engineering II 3.0 Credits
This course is the second part of a two-term sequence which introduces
biomedical engineering students to engineering principles applied
to biological and physiological systems. This course focuses on
bioinformatics, neuroengineering, biosignal processing, biosensors, and
medical imaging.
College/Department: School of Biomedical Engineering, Science Health
Systems
Repeat Status: Not repeatable for credit
Prerequisites: ECE 201 [Min Grade: D] (Can be taken
Concurrently)BMES 325 [Min Grade: D]

**BMES 330 Biological Rhythm in Pharmacology and Toxicology 3.0
Credits**
This course covers the fundamentals of biological rhythms with particular
emphasis on the influence these cycles have on the susceptibility of
organism to physical, chemical, and /or toxic agents.
College/Department: School of Biomedical Engineering, Science Health
Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 203 [Min Grade: D] or BMES 235 [Min Grade: D]

BMES 331 Computers in Health Systems I 3.0 Credits
Introduces the allied health professional to basic computer applications on
personal computers. Includes word processing, spreadsheets, databases,
and networking (e.g., e-mail and information search and retrieval) in a
primarily Windows environment. Designed for individuals with little or no
computer background. Students are encouraged to bring in their own
work-related problems or projects to provide immediate application of
knowledge learned to the student's professional healthcare environment.
College/Department: School of Biomedical Engineering, Science Health
Systems
Repeat Status: Not repeatable for credit

BMES 332 Computers in Health Systems II 3.0 Credits
Continues the general overview of computers for people in the allied
health professions, using specific examples from health care. Offers
further study of and practice with special scientific (e.g., statistics,
graphing) and medical clinical decision-support software. Introduces
algorithms and formal programming methods.
College/Department: School of Biomedical Engineering, Science Health
Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

BMES 335 Biomedical Informatics I 3.0 Credits
Introduces information and information handling systems for people in the allied health professions, with specific examples drawn from health care. Covers locating, manipulating, and displaying information in the health system setting.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

BMES 336 Biomedical Informatics II: Hospital and Patient Information 3.0 Credits
Continues BMES 335. Emphasizes medical records and hospital and patient information handling. Examines the problems of patient information flow within the health care system. Introduces conventional and proposed patient and hospital information systems.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: BMES 335 [Min Grade: D]

BMES 337 Introduction to Physiological Control Systems 3.0 Credits
Introduces the basic concepts of control theory as it is applied to biomedical systems including electrical, mechanical, physiological and cellular systems.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: (MATH 210 [Min Grade: D] or ENGR 232 [Min Grade: D] or MATH 262 [Min Grade: D]) and (BMES 432 [Min Grade: D] or ECES 302 [Min Grade: D]) and BMES 375 [Min Grade: D] and BIO 201 [Min Grade: D] and BMES 451 [Min Grade: D] and (BMES 238 [Min Grade: D] or MEM 238 [Min Grade: D])

BMES 338 Biomedical Ethics and Law 3.0 Credits
Introduces the wide spectrum of ethical, regulatory, and legal issues facing health care practitioners and health-related research workers. Helps students become aware of the ethical and legal issues involved in their work. Helps students understand how legal and ethical decisions should be made in health-related matters, as well as what sources of help and guidance are available.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

BMES 340 Health Care Administration 3.0 Credits
This course provides students with an analysis of health care administration process, including: planning, organizing, designing, decision-making, leading, and controlling. Presents methods and techniques that can contribute to the effective performance of administrative duties.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

BMES 341 Modeling in Biomedical Design II 2.0 Credits
This course is part 2 in a 2 part series meant to instruct students on how to leverage year appropriate skills while designing solutions to biomedical problems. Students will: a) develop mathematical model(s) to solve a biomedical problem(s), b) write software to simulate these solution(s), c) fabricate a solution based on simulation specifications, d) verify design solution according to identified engineering standards, f) review test results and propose further refinement (written document and oral presentation).
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: BMES 241 [Min Grade: D] and (MATH 210 [Min Grade: D] or ENGR 232 [Min Grade: D] or MATH 262 [Min Grade: D]) and (BMES 238 [Min Grade: D] or MEM 238 [Min Grade: D]) and ECE 201 [Min Grade: D] and ENGR 220 [Min Grade: D] and BMES 202 [Min Grade: D]

BMES 345 Mechanics of Biological Systems 3.0 Credits
This course introduces the fundamentals of mechanics of deformable bodies relevant to biological tissues and biomaterials. Major topics include stress and strain, mechanical properties of biological tissues and biomaterials, axial loading, torsion, bending, and viscoelasticity. These concepts will be applied to biological examples such as long bones, the heart, blood vessels, and orthopaedic implants.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: BIO 201 [Min Grade: D] (Can be taken Concurrently)MEM 202 [Min Grade: D] and ENGR 220 [Min Grade: D]

BMES 350 Med & Bio Effects Of Light 3.0 Credits
Examines the role of environmental lighting in human physiological and psychological processes. Topics include vitamin D synthesis and calcium regulation; light effects on bilirubin in newborns; photoactivation and DNA in skin; effects of nonionizing radiation on the immune systems; environmental lighting and human vision; light effects on biological rhythms and sleep; photosensitivity diseases related to interior lighting; the therapeutic uses of light; and light and the aging eye.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 203 [Min Grade: D] or BMES 235 [Min Grade: D]

BMES 363 Robotics in Medicine I 3.0 Credits
This course provides an introduction to the use of haptics (the use of somtaosensory information) in the design of robotic devices in surgery. Topics covered include actuators, sensors, nonportable feedback, portable force feedback, tactile feedback interfaces, haptic sensing and control systems.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: MEM 238 [Min Grade: D]

BMES 365 Robotics in Medicine II 3.0 Credits
This course covers the use of robots in surgery and included aspects of safety, robot kinematics, analysis of surgical performance using robotic devices, inverse kinematics, velocity analysis and acceleration analysis. Various types of surgeries in which robotic devices are or could be used are presented on a case study basis.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: BMES 363 [Min Grade: D]

BMES 372 Biosimulation 3.0 Credits
This course provides the foundation for the mathematical analysis of biomedical engineering systems. It focuses on the essential mathematical methods necessary for further development of modeling and simulation skills in other courses (materials, mechanics, fluids/transport, signals/control system, etc). The course applies calculus, differential equations and linear algebra to developing analytical techniques for biomedical applications.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: BIO 201 [Min Grade: D] and (ENGR 232 [Min Grade: D] or MATH 262 [Min Grade: D] or MATH 210 [Min Grade: D]) and BMES 202 [Min Grade: D]

BMES 375 Computational Bioengineering 4.0 Credits
This course introduces undergraduate students to the mathematical and computational analysis of biological systems. The systems analyzed include the genome, protein and gene networks, cell division cycles, and cellular level disease. Mathematical tools include matrix algebra, differential equations, cellular automata, cluster analysis, etc.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: BIO 201 [Min Grade: D] and BMES 202 [Min Grade: D] and (MATH 210 [Min Grade: D] or ENGR 232 [Min Grade: D] or MATH 262 [Min Grade: D])

BMES 381 Junior Design Seminar I 2.0 Credits
This is the first course in a two-course sequence intended to present the basics of engineering design, project management, product development and translational research. This first course focuses on engineering design and product development. A case-study approach is used to illustrate best practices and common mistakes in engineering design.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore

BMES 382 Junior Design Seminar II 2.0 Credits
This is the second course in a two-course sequence intended to present the basics of engineering design, project management, product development and translational research. This second course focuses on project management and quality control. A case-study approach is used to illustrate best practices and common mistakes in management and evaluation of engineering projects.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore
Prerequisites: BMES 381 [Min Grade: D]

BMES 391 Biomedical Instrumentation I 3.0 Credits
This course introduces the student to the medical instrumentation and provides background on the physical, chemical, electronic and computational fundamentals by which medical instrumentation operates. It is an analytical course exploring the design, operation, safety aspects and calibration of primary electronic instruments.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECE 201 [Min Grade: D] and (ENGR 210 [Min Grade: D] or CHEM 253 [Min Grade: D]) and (ENGR 232 [Min Grade: D] or MATH 210 [Min Grade: D] or MATH 262 [Min Grade: D]) and BIO 201 [Min Grade: D]

BMES 392 Biomedical Instrumentation II 3.0 Credits
Continues BMES 391. Explores the operation, safety aspects, and calibration of primarily optical and acoustical instruments, as well as those involving ionizing radiation. Also examines instrumentation primarily intended for particular departments and areas, such as anesthesia and infusion.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: BMES 391 [Min Grade: D]

BMES 401 Biosensors I 4.0 Credits
Introduces the general topic of microsensors, discusses basic sensing mechanisms for microsensors, and presents various types of conductometric, acoustic, silicon, and optical microsensors. Uses two case studies that include an acoustic immunosensor and silicon glucose sensor to provide students with in-depth knowledge and hands-on experience. Provides additional experience through three laboratory sessions that support the lectures and familiarize students with practical aspects of microsensors. Also discusses applications of microsensors in the medical, chemical, pharmaceutical, environmental, aeronautical, and automotive industries.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: (CHEM 253 [Min Grade: D] or ENGR 210 [Min Grade: D]) and ECE 201 [Min Grade: D] and (ENGR 232 [Min Grade: D] or MATH 262 [Min Grade: D] or MATH 210 [Min Grade: D])

BMES 402 Biosensors II 4.0 Credits
Investigates modern biosensor design methods and addresses the challenges associated with fabrication technologies and instrumentation techniques. Topics include theory and modeling of biosensors, biosensor fabrication steps, and electronic and clinical testing methods. Discusses local and distant sensor data acquisition techniques. Students will design, fabricate and test a biosensor. Essential stages of biosensor manufacturing processes will be outlined. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: BMES 401 [Min Grade: D] (Can be taken Concurrently)

BMES 403 Biosensors III 4.0 Credits
Covers recent advances in biosensor technology and applications, business aspects, and technology transfer issues. Topics include new sensing mechanisms, new technologies, new biomedical applications, the starting of small sensor companies, and the introduction of new sensor technologies into industrial settings. Requires students to develop a technical proposal in the area of biosensors and to review proposals written by their peers. Presentations by regular faculty and industrial and government researchers form an integral part of the course.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: BMES 402 [Min Grade: D]

BMES 405 Physiological Control Systems 3.0 Credits
Introduces the basic concepts of feedback and feed forward controls systems, including characterizations in terms of prescribed constraints, study of input and output relationships for various types of physiological systems, and stability and time-delay problems. Covers mathematical models of physiological systems, with emphasis on non-linear and adaptive systems study.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: BIO 201 [Min Grade: D] and BMES 202 [Min Grade: D] and (BMES 337 [Min Grade: D] or ECES 356 [Min Grade: D])

BMES 409 Entrepreneurship for BMES 3.0 Credits
This course serves as the foundation course in entrepreneurship and is designed to provide students with a complete working knowledge of the modern entrepreneurial and business planning process.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit

BMES 411 Chronoengineering I: Biological Rhythms in Health and Performance 3.0 Credits
Introduces students to the concepts of biological, and especially circadian, rhythmicity. Advances students' knowledge of biological time-keeping and adaptive functions of biological clocks. Topics include biochemical and physiological models of biological clocks, adjustment to environmental cycles, rhythms in behavior and physiological functions, sleep-wake cyclicity, adaptability of circadian systems, and influences of rhythms on human physiology and behavior. Designed to give students a thorough understanding of the role rhythms play in animal and human behavior, physiology, and medicine.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: BIO 201 [Min Grade: D]

BMES 412 Chronoengineering II: Sleep Functions in Health and Performance 3.0 Credits
Continues BMES 411. Enhances students' education in the concepts of biological, and especially circadian, rhythmicity. Focuses on sleep patterns, rhythms, evolution, neurology, psychology, and overall function.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: BMES 411 [Min Grade: D]

BMES 421 Biomedical Imaging Systems I: Images 4.0 Credits
Provides an overview of the field of medical imaging. Covers aspects of light imaging; systems theory, convolutions, and transforms; photometry, lenses, and depth of field; image perception and roc theory; three-dimensional imaging; image acquisition and display; and image processing operations, including scanning and segmentation.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: (ECES 302 [Min Grade: D] or ECES 303 [Min Grade: D] or BMES 432 [Min Grade: D]) and PHYS 201 [Min Grade: D] and (MATH 311 [Min Grade: D] or BMES 310 [Min Grade: D])

BMES 422 Biomedical Imaging Systems II: Ultrasound 4.0 Credits
Intended for students who would like to gain an adequate understanding of diagnostic ultrasound imaging principles and become familiar with developments in this rapidly expanding field. Introduces medical visualization techniques based on ultrasound propagation in biological tissues. Topics include generation and reception of ultrasound, imaging techniques (A-mode, B-mode, M-mode, and Doppler), typical and emerging diagnostic applications, elements of ultrasound exposimetry, and safety aspects from the clinical point of view.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: BMES 421 [Min Grade: D]

BMES 423 Biomedical Imaging Systems III 4.0 Credits
Covers volumetric and functional imaging systems. Discusses the principles and algorithms of projection tomography, XCAT, SPECT, PET; the principles of MRI: Bloch equation, slice selection, K-space scanning, volumetric MRI; biochemical imaging; chemical equilibrium equations and Scatchard plots, specific and nonspecific labeling; autoradiography; and flow and dynamical systems: Doppler, mass transport, and phase (MRI) measurement of flow.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: BMES 422 [Min Grade: D]

BMES 430 Neural Aspects of Posture and Locomotion 3.0 Credits
Students will study the physiology of ensory/motor systems, with emphasis on modeling of neural systems and biomechanical aspects of functional tasks. Combines information on basic nerve cell activities, synaptic communication and structure/function relationships of skeletal muscle with basic mechanics to study spinal, vestibular and ocular reflexes. Culminates with the study of the control of motor systems with respect to bipedal motion.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: BIO 201 [Min Grade: D] and BMES 202 [Min Grade: D] and MEM 202 [Min Grade: D]

BMES 432 Biomedical Systems and Signals 3.0 Credits
Introduces various aspects of biomedical signals, systems, and signal processing. Covers topics in the origin and acquisition of biomedical signals; discrete-time signals and linear systems; frequency analysis of discrete-time signals, spectral estimation, data records and digital filters; and compression of biomedical signals through time-domain and frequency-domain coding.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore
Prerequisites: MATH 210 [Min Grade: D] or ENGR 232 [Min Grade: D] or MATH 262 [Min Grade: D]

BMES 440 Introduction to Biodynamics 3.0 Credits
The objective of the course is to prepare students for biomechanical modeling, modeling methods, formulation of equations of motion and methods of determination of strength will be applied to human body dynamics. Particular emphasis is placed on the use of Rigid Body and Multi-Body Dynamics.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: BIO 201 [Min Grade: D] and (MEM 238 [Min Grade: D] or BMES 238 [Min Grade: D]) and (MATH 210 [Min Grade: D] or ENGR 232 [Min Grade: D] or MATH 262 [Min Grade: D])

BMES 441 Biomechanics I: Introduction to Biomechanics 4.0 Credits
Teaches students to use mechanical tools to get an introductory appreciation for solving biomechanical problems. Models human performance by using static, quasi-static, and dynamic approaches. Assesses overall loading of the musculoskeletal system during functional activities. Demonstrates introductory methods of estimation of forces in the joints and muscles and evaluates the endurance of the human tissues under traumatic loading conditions. Builds on existing knowledge in mechanics to illustrate the practical application of mechanical tools in the determination of human systems performance.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: (MEM 230 [Min Grade: D] or BMES 345 [Min Grade: D]) and (MEM 238 [Min Grade: D] or BMES 238 [Min Grade: D]) and BIO 201 [Min Grade: D]

BMES 442 Biomechanics II: Musculoskeletal Modeling and Human Performance 4.0 Credits
Teaches students to think biomechanically. Reviews and categorizes the various functional components (tissues) of the musculoskeletal system. Considers constraints of the joints and action of the soft and hard tissues, along with corresponding models. Computes joint and muscle forces. Discusses some aspect of postural stability of the whole musculoskeletal structure and reviews various methods of task performance.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: BMES 441 [Min Grade: D]

BMES 443 Biomechanics III: Mechanics of Biological Tissues, Implant Technology and Prosthetics 4.0 Credits
Provides more advanced knowledge of mechanics of materials and offers a general description of mechanical behavior of the variety of the soft and hard tissues of the human body. Considers some prosthetic replacements of tissues as well as entire bone, joint, soft tissue, and system prosthetics. Reviews some specific orthopedic appliances and covers limb prosthetics if time permits. Students plan design projects.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: BMES 442 [Min Grade: D]

BMES 444 Biofluid Mechanics 3.0 Credits
This course introduces flow-related anatomy and pathophysiology, and biomedical flow devices and their design challenges. Analysis methods to solve biological fluid mechanics design problems will be introduced and several interdisciplinary team projects will be assigned to apply fluid mechanics to practical biological or medical problems.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: BMES 451 [Min Grade: D] and BIO 201 [Min Grade: D]

BMES 451 Transport Phenomena in Living Systems 4.0 Credits
Introduces students to applications of chemical engineering concepts in biological systems. Shows that chemical engineering approaches to problem solving are ideally suited to investigation of biology. Approaches include material and energy balances, transport phenomena, and kinetics.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore
Prerequisites: BIO 201 [Min Grade: D] and (CHEM 253 [Min Grade: D] or ENGR 210 [Min Grade: D]) and (ENGR 232 [Min Grade: D] or MATH 262 [Min Grade: D] or MATH 210 [Min Grade: D])

BMES 452 Transport Phenomena in Living Systems II 3.0 Credits
Continues BMES 451. Advances students' understanding of the engineering principles of membrane transport and its consequences at the subcellular (mitochondria), cellular (neuron), and organ (kidney) level. Introduces concepts associated with pharmacokinetics. Provides students with a kinetic approach to analysis of receptors, including the kinetics of ligand-receptor binding, rate constants, and signal transduction.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore
Prerequisites: BMES 451 [Min Grade: D]

BMES 460 Biomaterials I 4.0 Credits
First course in a three-quarter sequence designed to acquaint students with the behavior of materials used in biomedical application under load (i.e., mechanical properties), their modes of failure and as a function of their environment. This course provides students with the fundamentals needed to proceed with Biomaterials II.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: CHEM 241 [Min Grade: D] and BMES 345 [Min Grade: D] or MEM 230 [Min Grade: D] or MATE 360 [Min Grade: D] and (MATE 221 [Min Grade: D] or MATE 230 [Min Grade: D])

BMES 461 Biomaterials II 4.0 Credits
Second course in a three-quarter sequence in biomaterials. The goal of this course is with an understanding of, and ability to select, appropriate materials for specific applications taking into account mechanical, thermal, and rheological properties taught in Biomaterials I and combining them with the biocompatibility issues covered in the present course.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: BMES 460 [Min Grade: D]

BMES 466 Robotics in Medicine III 3.0 Credits
This course covers topics in the design of medical robotic systems, including force and movement analysis for robotic arms, dynamics, computer vision and vision-based control. Thus use of haptics, vision systems and robot dynamics are examined in a cohesive framework.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: BMES 365 [Min Grade: D]

BMES 471 Cellular and Molecular Foundations of Tissue Engineering 4.0 Credits
Course is designed to familiarize students with the advanced concepts of cellular and molecular biology and physiology relevant to tissue engineering. The initial part of a two-quarter sequence combining material from cellular/molecular biology, evolutionary/developmental biology with engineering design and biomaterials to educate students in the principles, methods, and technology of tissue engineering.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: BIO 218 [Min Grade: D] and BIO 219 [Min Grade: D] and (MEM 230 [Min Grade: D] or BMES 345 [Min Grade: D])

BMES 472 Developmental and Evolutionary Foundations of Tissue Engineering 4.0 Credits
Familiarizes students with advanced concepts of developmental and evolutionary biology relevant to tissue engineering. This second part of the two-quarter sequence combines material from cellular/molecular biology and evolutionary design and biomaterials to educate students in the principles, methods, and technology of tissue engineering.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: BMES 471 [Min Grade: D]

BMES 475 Biomaterials and Tissue Engineering III 4.0 Credits
This course provides students with in-depth knowledge of factor-mediated tissue engineering and regenerative medicine. Students learn about fundamental repair and regenerative processes and gain an understanding of specific biomaterials being used to mimic and/or enhance such processes. Students also learn about the delivery methods of agents which promote the proper functional development of specialized tissues.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: BMES 461 [Min Grade: D] and BMES 472 [Min Grade: D]

BMES 477 Neuroengineering I: Neural Signals 3.0 Credits
Introduces the theory of neural signaling. Students will learn the fundamental theory of cellular potentials and chemical signaling, the Hodgkin Huxeley description of action potential generation, circuit representations of neurons and be able to derive and integrate equations describing the circuit as well as design computer models.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: (BMES 337 [Min Grade: D] or ECES 356 [Min Grade: D]) and BIO 201 [Min Grade: D] and (BIO 462 [Min Grade: D] or BMES 430 [Min Grade: D] or BIO 348 [Min Grade: D])

BMES 478 Neuroengineering II: Principles of Neuroengineering 3.0 Credits
This course investigates cutting edge technologies in neuroengineering in a seminar-style format with faculty from the School of Biomedical Engineering and College of Medicine. Three modules cover topics, which vary from year to year. Students are expected to submit written and oral presentations covering each topic.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: BMES 477 [Min Grade: D]

BMES 483 Quantitative Systems Biology 4.0 Credits
This course uses a data-driven systems engineering approach to provide a foundation in systems biology. Topics covered include the organization of robust networks of genes and proteins; intercellular communication; and cells as basic units of life.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: BMES 375 [Min Grade: D] and BIO 218 [Min Grade: D]

BMES 484 Genome Information Engineering 4.0 Credits
This course is designed to provide students with hands-on experience in the application of genomic, proteomic, and other large-scale information to biomedical engineering. The underlying goal is to develop an understanding of high-throughput technologies, biological challenges, and key mathematical and computational methods relevant to biomedical engineering.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: BMES 375 [Min Grade: D] and BIO 218 [Min Grade: D]

BMES 485 Brain Computer Interface Laboratory 2.0 Credits
This course explores an exciting aspect of neuroengineering, brain computer interfaces (BCI), in a hands-on laboratory setting. The course addresses both the human and computational elements of the technology emphasizing an engineering perspective while utilizing and modifying common paradigms in electroencephalogram (EEG)-based BCIs.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Prerequisites: BMES 412 [Min Grade: D] or BMES 430 [Min Grade: D] or BMES 432 [Min Grade: D]

BMES 488 Medical Device Development 3.0 Credits
Medical device product development must take into account a diverse set of disciplines to achieve a safe and successful product. This course exposes the student to several of these disciplines with the objective of raising the student¿s awareness of safety throughout the product development life cycle. Students will learn to appreciate the complex engineering decisions that support development of a safe medical device through an examination of risk management, regulatory processes, human factors and clinical studies.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.

BMES 491 [WI] Senior Design Project I 3.0 Credits
This is the first course in a three-quarter capstone design experience for senior biomedical engineering students.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.

BMES 492 Senior Design Project II 2.0 Credits
Continues senior design activities begun in BMES 492.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.

BMES 493 Senior Design Project III 3.0 Credits
Continues the design project begun in BMES 491 and continued through BMES 492.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.

BMES 494 Clinical Practicum I 3.0 Credits
This course provides biomedical engineering students with an extensive exposure to live clinical cardiology procedures, including cardiac catheterization, electrophysiology, echocardiography and nuclear stress testing. Emphasis is placed on identifying important interfaces between engineering and clinical medicine, particularly in areas where clinical needs may be addressed by advances in biomedical engineering.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is BME.

BMES 495 Clinical Practicum II 3.0 Credits
This course provides biomedical engineering students with an extensive exposure to live operations in an emergency department and intensive care unit. The students are expected to analyze specific operations within these environments and develop a solution to a process problem within one of these environments. System analysis, design and evaluation are emphasized.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is BME.

BMES 496 Clinical Practicum III 3.0 Credits
This course provides biomedical engineering students with an opportunity to observe basic operative and postoperative procedures with the idea of both learning about such procedures and identifying the role of biomedical engineering in these clinical settings.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is BME.

BMES I199 Independent Study in BMES 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Can be repeated multiple times for credit

BMES I299 Independent Study in BMES 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Can be repeated multiple times for credit

BMES I399 Independent Study in BMES 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Can be repeated multiple times for credit

BMES I499 Independent Study in BMES 0.5-6.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Can be repeated multiple times for credit

BMES T180 Special Topics in BMES 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Can be repeated multiple times for credit

BMES T280 Special Topics in BMES 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Can be repeated multiple times for credit

BMES T380 Special Topics in BMES 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Can be repeated multiple times for credit

BMES T480 Special Topics in BMES 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Can be repeated multiple times for credit

Biomedical Engineering Tech

Courses

BET 301 Healthcare Technology 3.0 Credits
An overview of medical equipment used in hospitals and other medical environments to diagnose and treat patients. Sensors and physiological signals will be explained. Equipment found in various hospital departments and medical specialties will also be discussed. Patient safety and regulations will be emphasized.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 201 [Min Grade: D] and EET 202 [Min Grade: D]

BET 302 Biomedical Electronics 4.0 Credits
This course is an introduction to the fundamentals of analog electronics with an emphasis on biomedical applications. Students will be introduced to solid state devices including diodes, transistors, operational amplifiers, oscillators, and mixers and their use in power supplies, amplifiers and active filters.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 201 [Min Grade: D] and EET 202 [Min Grade: D]

BET 303 Medical Imaging Systems 3.0 Credits
The fundamentals of medical imaging equipment will be explored. The principles of x-ray, computed tomography, ultrasonic, and magnetic resonance imaging systems will be discussed. Focus will be on principles of operation, applications, safety, and quality.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: BET 301 [Min Grade: D]

BET 305 Clinical Laboratory Equipment 3.0 Credits
Clinical laboratory instrumentation and automation is described with emphasis on the demands of clinicians for diagnostic information. Special attention is given to reliability, ease of training, and cost effectiveness.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 201 [Min Grade: D] and EET 202 [Min Grade: D] and BET 301 [Min Grade: D]

BET 307 Applied Biomedical Instrumentation 3.0 Credits
The course introduces students to the engineering design process and provides design experience through hands-on design and implementation of biomedical instruments. Using a generalized step-by-step approach that consists of (1) understanding the physiological sources, (2) selecting appropriate transducers, (3) designing analog processing electronics, and (4) implementing digital signal processing, student will gain extensible knowledge and skills to design and implement various biomedical instruments.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 201 [Min Grade: D] and EET 202 [Min Grade: D] and BET 301 [Min Grade: D] and BMES 391 [Min Grade: D]

BET I199 Independent Study in BET 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consulation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

BET I299 Independent Study in BET 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consulation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

BET I399 Independent Study in BET 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consulation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

BET I499 Independent Study in BET 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consulation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

BET T180 Special Topics in BET 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

BET T280 Special Topics in BET 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

BET T380 Special Topics in BET 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

BET T480 Special Topics in BET 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

Bioscience & Biotechnology

Courses

BIO 100 Applied Cells, Genetics & Physiology 3.0 Credits
This course is designed to provide a topical and interactive introduction to biology for non-majors. Students will learn how trillions of tiny cells of our bodies work together in organ systems to use food for energy, to keep us alive, moving and healthy, and how information passes to subsequent generations. This course is identical to BIO 107.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is BIO
Corequisite: EXAM 080

BIO 101 Applied Biological Diversity, Ecology & Evolution 3.0 Credits
An interactive course for the non-major that discusses the variety of living things and how we ended up with them and what makes them unique. This course also explores how living things affect each other and the world as well as the impacts that humans have on the living world. This course is identical to BIO 109.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is BIO
Corequisite: EXAM 080

BIO 107 Cells, Genetics & Physiology 3.0 Credits
This course is designed to provide a topical and interactive introduction to biology for non-majors. Students will learn how trillions of tiny cells of our bodies work together in organ systems to use food for energy, to keep us alive, moving and healthy, and how information passes to subsequent generations. This course is identical to BIO 100.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is BIO
Corequisites: BIO 108, EXAM 080

BIO 108 Cells, Genetics and Physiology Laboratory 1.0 Credit
This course is designed to be a companion course to the BIO 107 lecture. Labs are focused on providing students with a hands-on approach to science. Topics include how cells generate energy from food, how certain characteristics are genetically encoded and the physiology of human systems and diseases.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is BIO
Corequisite: BIO 107

BIO 109 Biological Diversity, Ecology & Evolution 3.0 Credits
An interactive course for the non-major that discusses the variety of living things and how we ended up with them and what makes them unique. This course also explores how living things affect each other and the world as well as the impacts that humans have on the living world. This course is identical to BIO 101.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is BIO
Corequisites: BIO 110, EXAM 080

BIO 110 Biological Diversity, Ecology and Evolution Laboratory 1.0 Credit
A companion course to BIO 109 that provides a hands on exploration of the diversity of life including microbes, plants and animals as well as the processes that give rise to this diversity. The labs also provide practical exploration of the impacts of human beings on the planet.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is BIO
Corequisite: BIO 109

BIO 112 Biotechnology for Society 3.0 Credits
In Biotechnology for Society, students will become familiar with the fundamentals of genomic and cellular-based biotechnologies to begin to understand the roles that biotechnology is currently playing and is poised to play in society. Students will appreciate the complexity of those roles by investigating both the intended consequences and the potential and inadvertent ethical, legal and social implications of these technologies. This course is intended for non-science majors.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is BIO or major is BME or major is CHEM or major is ENVS or major is HSCI

BIO 114 Climate Change and Human Health 3.0 Credits
This inquiry based open enrollment course is designed to provide a topical and interactive exposure to the human health hazards associated with global climate change. Despite the burden of evidence of global climate change, it is not uncommon for the members of the general public to express apathy because the consequences seem so far removed in distance and time. The goal of this course is to bring climate change closer to home through a discussion of the imminent threat posed to human health.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

BIO 116 How Your Body Works-Or Not 3.0 Credits
How Your body Works-or Not is geared for non-major students hoping to explore the workings of their bodies. Students will explore why we evolved to have various organ systems, and how some systems accomplish their roles. We will explore how these systems can malfunction or fail, resulting in disease.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is BIO or major is BME or major is CHEM or major is ENVS or major is HSCI

BIO 118 Basics of Cancer 3.0 Credits
This course provides an opportunity for students with little or no biology background to learn about cancer. Students can expect to learn what cancer is from a biological perspective, and how it is caused and treated. Students will also gain a basic understanding of how tumors form, and metastasize.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is BIO or major is BME

BIO 120 Phage Phinder's Research 1.0 Credit
This supplemental discovery based lab course has been designed to discover and analyze new bacteriophage viruses. Students will isolate unique bacteriophages, annotate the genes of selected bacteriophage genomes, and develop independent projects using hypothesis driven experimental planning.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

BIO 122 Cells and Genetics 4.5 Credits
An introduction to the concepts of cell and function, cell and reproduction, cell communication, genetic inheritance, and population genetics. The relevance of genetics to society and ethical issues are included.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: EXAM 080

BIO 124 Evolution & Organismal Diversity 4.5 Credits
Students will learn about the theory of evolution and the mechanisms of how organisms change. Using this knowledge, students will explore the diversity of organisms on Earth that is a hallmark of biology and the result of evolution by examining the representative members from the five major kingdoms of life. This course has a lecture, lab and recitation component.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: EXAM 080

BIO 126 Physiology and Ecology 4.5 Credits
The first half of the course will survey physiological systems, including the respiratory, circulatory, homeostatic, excretory, and digestive systems in animals. The second half of the course will emphasize the relationships between organisms and the environment, including how humans impact ecosystems and the biosphere. This course has a lecture, lab and recitation component.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: EXAM 080

BIO 128 Bacteriophage Discovery Laboratory 2.0 Credits
In this course, students will design and perform independent research projects in order to learn more about bacteriophages. Students can work independently or in groups to develop a research question and hypothesis, and to perform either wet-lab experiments or bioinformatics analysis to draw conclusions about a novel aspect of bacteriophage biology. At the end of this course, students will present their results in the form of a poster presentation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 124 [Min Grade: D]

BIO 141 Essential Biology 4.5 Credits
Introduces essential biological concepts to engineering students. Content covers five core topics: cells, genetics, evolution, ecology and physiology with application to societal concerns about biotechnology, health, conservation biodiversity and bioethics. Evolution will be woven throughout the course as a unifying theme in understanding all aspects of biology.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is CS
Prerequisites: CHEM 101 [Min Grade: D]
Corequisite: EXAM 080

BIO 161 General Biology I 3.0 Credits
Covers structure and function of the cell and the organ-system plan of organization of the human body.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is BIO or classification is Freshman

BIO 162 General Biology II 3.0 Credits
Continues BIO 161. Covers the mechanics of heredity, including growth, differentiation, and development. Winter.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 161 [Min Grade: D]

BIO 163 General Biology III 3.0 Credits
Continues BIO 162. Covers the plant and animal kingdoms, radiobiology, evolution, and ecology. Spring.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 162 [Min Grade: D]

BIO 164 General Biology Laboratory I 1.0 Credit
In this course students will perform computer simulations of laboratory exercises related to photosynthesis, enzyme activity and kinetics, the cardiovascular, muscle and bone systems, regulation of human organ systems as well as plant growth and development.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: BIO 161

BIO 165 General Biology Laboratory II 1.0 Credit
In this course students will perform computer simulations of laboratory exercises related to cell division, mendelian genetics, DNA replication, translation and mutations. They will work with simulated microscopes to observe viral and microbial specimens. Additionally, students will learn and simulate biotechnology techniques such as DNA fingerprinting.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 161 [Min Grade: D]
Corequisite: BIO 162

BIO 166 General Biology Laboratory III 1.0 Credit
Involves experiments demonstrating the key principles in ecology and evolution including: population parameters, food webs, species interactions, succession, eutriphication, natural selection, sexual selection and evolutionary trees.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 162 [Min Grade: D]
Corequisite: BIO 163

BIO 177 Mentorship in STEM 0-1 Credits
This course is designed to develop and enhance student mentorship and leadership skills, emphasizing communication among undergraduate peers in STEM disciplines. The course will focus on the mentor-mentee relationship, professionalism, respect for diversity, and mentorship skill development.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

BIO 200 Connections in Biology 3.0 Credits
Connections in Biology is an open enrollment course which will give students the opportunity to make exactly that: connections. Building upon a new theme in biology each week, students will connect that material to their current Philadelphia community as well as to their future professional and personal pursuits. The course is designed on the Community Based Learning platform (CBL) and is scheduled to meet twice a week: one meeting will be a formal lecture on campus and one meeting will be at a partnered middle school with the instructor and Drexel students leading an 9 week after school science club. Students will gain volunteer hours, get an introduction to civic engagement, benefit from community based learning practices and connect their Drexel course material to the bigger picture in their lives.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

BIO 201 Human Physiology I 4.0 Credits
Intensive survey of the basic physiological mechanisms of cellular and human electrophysiology and the physiology of the muscular, cardiovascular, respiratory, renal, and gastrointestinal systems.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 141 [Min Grade: D] or BIO 122 [Min Grade: D]

BIO 202 Human Physiology Laboratory 2.0 Credits
Laboratory course in human physiology. Designed to accompany BIO 201 and 203 Human Physiology I and II. Uses simulation, experimenters and data acquisition techniques to provide practical experience in the design and execution of physiological experiments and analysis of physiological data. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 201 [Min Grade: D] (Can be taken Concurrently)

BIO 203 Human Physiology II 4.0 Credits
Intensive survey of the control mechanisms of cellular and human physiology including introductions to control theory, neurophysiology, endocrine control, and control mechanisms in locomotion, cardiovascular, respiratory, renal, acid/base, gastrointestinal, and reproductive physiology.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 201 [Min Grade: D]

BIO 204 The Privilege of Aging 3.0 Credits
The Privilege of Aging is a Hybrid Community-Based Course that is open to students that have completed BIO 122. Aging is often thought of as a negative process, however there are important benefits that are largely uncelebrated. Students in this course will explore the privilege of aging and ways to do it well with senior members of the Philadelphia community. There will be 2 class meetings each week, one on campus and one at a designated senior citizen facility. In addition to the academic underpinnings of the biology of aging, the course will provide the students with intergenerational interactions, as well as opportunities to connect the experience with their academic path at Drexel and their future professional plans.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 122 [Min Grade: D]

BIO 207 Applications in Biology I 1.0 Credit
The aim of this course is to allow students to apply knowledge from biology courses to understand important articles from the frontiers of biology research, in order to develop critical thinking and problem solving skills. Students will learn to read primary research, to think critically about research and interpret data.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 122 [Min Grade: D]

BIO 208 Applications in Biology II 1.0 Credit
In this course, students will further develop and practice skills introduced in the Applications in Biology I course by reading and interpreting research from primary articles. This will include historical experiments and controversial research. This will help students develop critical thinking, scientific reasoning and problem solving skills.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 207 [Min Grade: D]

BIO 209 Cell, Molecular & Developmental Biology I 4.0 Credits
In this course, students will cover essential topics in cell, molecular, and developmental biology. Topics, such as protein structure function relationships, enzymes, structural & functional properties of nucleic acids, transcription & translation, regulation of gene expression, eukaryotic cell structure, cell membranes and membrane transport. Commonly used techniques in biochemistry, molecular & cellular biology will be discussed.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 122 [Min Grade: D]

BIO 211 Cell, Molecular & Developmental Biology II 4.0 Credits
In this course, students will learn about molecular, cellular and developmental biology at a higher level than in introductory coursework. This second course in the sequence will focus on cell biological processes such as: vesicular trafficking, signaling, cytoskeletal dynamics, cell cycle, cell death, tissue organization, stem cells and development. At the end of this course, students should have a strong foundation in cell and developmental biology.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 209 [Min Grade: D]

BIO 212 Biotechnology 3.0 Credits
Covers the use of recombinant DNA techniques in biotechnology. Explores the many uses of biotechnology in the biological, agricultural and medical field. Also covers the social, ethical and environmental issues involved in this discipline.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 122 [Min Grade: D]

BIO 213 Drosophila Neural Research 3.0 Credits
In this course, you will be introduced to the basics of performing directed research in Drosophila genetics and neurobiology. This research will be informed by its relevance to disease. You will be working on one of a variety of diseases that is related to neurodevelopmental and/or neurodegenerative diseases. Diseases include (but are not limited to) CHARGE syndrome, Alzheimer's disease, Pitt-Hopkins disease, and schizophrenia. In this course, you will be testing for potential genetic modifiers and/or drugs that modify disease phenotypes associated with an established models of these diseases.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Freshman or Sophomore .
Prerequisites: BIO 122 [Min Grade: D]

BIO 214 Principles of Cell Biology 4.0 Credits
The course familiarizes students with the basic fundamentals and principles of cell biology. Topics include protein and enzymes as metabolic facilitators, the source and function of cellular energy, cell structure and function, cellular protein transport, cell communication, cell cycle control, apoptosis, and cell differentiation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is BIO
Prerequisites: BIO 122 [Min Grade: D] or BIO 141 [Min Grade: D] or BIO 100 [Min Grade: D] or BIO 107 [Min Grade: D]

BIO 215 Techniques in Cell Biology 3.0 Credits
A course designed to introduce students to the lab techniques used by cell biologists. The lab is project-based focusing on various assays to assess cell viability/survival and fluorescence microscopy is used for cell structure and their organelles, apoptosis, cytoskeletal structure, muscle contraction and cell motility. Other topics include protein separation and quantification, and gel electrophoresis. Analytical thinking and data analysis are emphasized to help foster the development of a project built on multiple experiments.This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: or BIO 122 [Min Grade: D] or BIO 141 [Min Grade: D]

BIO 218 Principles of Molecular Biology 4.0 Credits
The course is designed to familiarize students with the details and concepts revolving around molecular biology's "central dogma." Specifically the chemical nature of DNA and RNA, the molecular structure of DNA and chromosomes, the definition of a gene, how DNA is replicated, and how genes are expresses and regulated.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is BIO
Prerequisites: BIO 122 [Min Grade: D] or BIO 141 [Min Grade: D]

BIO 219 [WI] Techniques in Molecular Biology 3.0 Credits
Designed to familiarize student with laboratory techniques utilized in molecular biology, specifically DNA isolation, characterization, and manipulation. Students work in teams to collect and analyze data and explain results in laboratory reports. Weekly recitations preview and review theory and techniques used in the lab. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 122 [Min Grade: D] or BIO 141 [Min Grade: D]

BIO 220 Essential Microbiology 3.0 Credits
Covers morphological, physiological, and biochemical characteristics of bacteria, fungi, algae, and protozoa, and viruses. Introduces the principles of microbial genetics, disease, and control of microorganisms. This course is identical to BIO 221.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is BIO
Prerequisites: BIO 122 [Min Grade: D] or BIO 141 [Min Grade: D]

BIO 221 Microbiology 3.0 Credits
Covers morphological, physiological, and biochemical characteristics of bacteria, fungi, algae, protozoa, and viruses. Introduces the principles of microbial genetics, disease, and control of microorganisms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 122 [Min Grade: D] or BIO 141 [Min Grade: D]
Corequisite: BIO 222

BIO 222 Microbiology Laboratory 2.0 Credits
An introduction to microbiological techniques, and culture of prokaryotic and eukaryotic organisms. Includes sterile techniques, and use of specialized microscopic techniques. Classical and molecular techniques of microbial identification are also covered.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 122 [Min Grade: D] or BIO 141 [Min Grade: D]
Corequisite: BIO 221

BIO 224 Form, Function & Evolution of Vertebrates 4.0 Credits
This course is an introduction to principles of organismal biology from the perspective of form, function and evolution of fish, amphibians, reptiles, mammals and birds. Many biological principles are well known in this group of animals. Data from areas as diverse as paleontology, ecology and molecular biology will be presented.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 121 [Min Grade: D] or BIO 122 [Min Grade: D] or BIO 124 [Min Grade: D] or BIO 126 [Min Grade: D]

BIO 225 Vertebrate Biology and Evolution Laboratory 2.0 Credits
A hands-on laboratory course that complements BIO 224: Form, Function & Evolution of Vertebrates. Students use the comparative approach to learn about the anatomy, physiology and evolution of vertebrates. Laboratory work will be on campus and in the field trips to observe vertebrates in nature.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 224 [Min Grade: D] (Can be taken Concurrently)

BIO 226 Microbiology for Health Professionals 5.0 Credits
An introduction to microbiology for students in the health professions. Covers the diversity of microorganisms, their growth and how to control them. An introduction to the principles of disease and pathogenicity, host interaction and immunological response. Laboratories focus on the basic techniques to culture and student microorganisms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

BIO 228 Evolutionary Biology & Human Health 3.0 Credits
This course illustrates the importance and utility of evolutionary perspectives on various topics related to human health. In addition to the "how" questions, this course also introduces the "why" questions. Various evolutionary hypotheses are examined. Arguments for and counter-arguments against each hypothesis are presented to foster understanding of each topic. Selected topics include infectious diseases, pathogen virulence, allergies/asthma, mental health/addiction, genetic disorders, diseases of civilization, sex, pregnancy, aging, and public health concerns.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 122 [Min Grade: D] and BIO 124 [Min Grade: D]

BIO 232 Discovering Antibiotics 3.0 Credits
The focus of this course is the process of research and inquiry that leads to the isolation, characterization and identification of potential antibiotic producing microbial strains and species from soil. Students will work in small groups to collaboratively design and carry out their own experiments that will isolate these microorganisms. During this course, you will learn about the structure, metabolism, nutrition, and diversity of soil microorganisms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 122 [Min Grade: D]

BIO 244 Genetics I 3.0 Credits
Surveys Mendelian, microbial, molecular, and population genetics. Discusses model systems and analytical methods used by geneticists to understand gene functions at cellular, organismal, and population levels.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 122 [Min Grade: D]

BIO 256 Vertebrate Morphology and Physiology 3.0 Credits
Provides comparative study of the major vertebrate groups, relationships between physiology and organismal structure, evolutionary history, comparative anatomy, and development.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 224 [Min Grade: D] or ENVS 212 [Min Grade: D]

BIO 257 Vertebrate Morphology & Physiology Lab 2.0 Credits
A hands-on laboratory course that complements BIO 256: Vertebrate Morphology and Physiology. Students will use comparative dissections of representative vertebrates to understand the anatomy and evolution of major vertebrate groups.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 256 [Min Grade: D] (Can be taken Concurrently)

BIO 264 Ethnobotany 3.0 Credits
This course explores the relation between ancient/cultural botanical knowledge and its current application in modern pharmacology and alternative forms of medicine. It provides an interdisciplinary approach to the study of plants for food, medicine, stimulation, religious rituals and death.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

BIO 284 Biology of Stress 3.0 Credits
This course focuses on the biological responses to the physical and psychological stress, discussing in turn stress responses in various organ systems. Emphasis is given to the analysis and evaluation of conflicting biological evidence on stress effects.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 100 [Min Grade: D] or BIO 101 [Min Grade: D] or BIO 107 [Min Grade: D] or BIO 109 [Min Grade: D] or BIO 122 [Min Grade: D] or BIO 141 [Min Grade: D]

BIO 285 Forensic Biology 3.0 Credits
This course will introduce students to the fascinating subject of forensic science, and specifically the role that biology can play in solving crimes. Topics being covered will include examining a crime scene, and the analysis of biological materials such as fingerprints, blood, plant material and human remains. During the course students will have to play the role of a forensic scientist, applying the knowledge that they will learn each week to see if they can determine who committed the crime. Case studies from real crimes will also be used to illustrate the points being made.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 122 [Min Grade: D]

BIO 286 Forensic Toxicology 3.0 Credits
In this online course students will study forensic toxicology, the study of chemicals- drugs, alcohol and poisons (to name a few), in relation to legal cases. These cases may involve identification of a powder, or examination of an envelope for traces of poisons, or the analysis of a blood samples to identify and quantify the presence of a substance which may have results in intoxication or even death.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 285 [Min Grade: D]

BIO 305 Mobilizing the Scientific Method 3.0 Credits
The main intent of this STEM Connections Course is for Drexel students and the Robeson students with whom we will be partnering to experience the Scientific Method. Both sets of students, Drexel and high school partners, will be instructed with active learning pedagogical methodologies to enhance student understanding. Students in both cohorts will learn to apply the scientific method to questions about plants. This course is a Community-Based Learning Course.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Prerequisites: BIO 100 [Min Grade: D] or BIO 101 [Min Grade: D] or BIO 107 [Min Grade: D] or BIO 108 [Min Grade: D] or BIO 122 [Min Grade: D] or BIO 141 [Min Grade: D]

BIO 306 Biochemistry Laboratory 2.0 Credits
Covers biochemical techniques ranging from basic laboratory preparatory work such as making solutions to the measurement of enzyme kinetics and substrate specificity.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 242 [Min Grade: D] or CHEM 248 [Min Grade: D]

BIO 311 Biochemistry 4.0 Credits
Covers bioenergetics and metabolism; enzymes, substrates, products, coenzymes, transporters, pathways (catabolic and anabolic for carbohydrates, lipids, amino acids, and nucleotides). Intracellular regulation, intercellular regulation, and how all this serves to meet the need of the cell and organism.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 242 [Min Grade: D] or CHEM 248 [Min Grade: D]

BIO 312 Genetically Modified Foods 2.0 Credits
Covers the application of recombinant DNA techniques in the creation of genetically modified foods. Explores the many uses of these food. Also covers the social, ethical and environmental issues involved in the use of genetically modified foods.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 100 [Min Grade: D] or BIO 107 [Min Grade: D] or BIO 122 [Min Grade: D] or BIO 141 [Min Grade: D]

BIO 314 Pharmacology 3.0 Credits
In this course, students will apply their studies of chemistry and biology to understand how drugs: are designed, affect the body, and are affected by the body. Students can expect to learn the fundamentals of pharmacology, and to discuss current topics and novel approaches being used to design new therapeutics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 218 [Min Grade: D] or BIO 211 [Min Grade: D]

BIO 318 Biology of Cancer 3.0 Credits
In this course, students will apply their studies of cell and molecular biology to understand cancer pathology. Starting with a fundamental knowledge of normal cellular processes, students will learn how normal processes go awry in tumor development and metastasis, and the current approaches being used to develop new cancer therapeutics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (BIO 214 [Min Grade: D] and BIO 218 [Min Grade: D]) or BIO 211 [Min Grade: D]

BIO 320 Microbial Pathogenesis 3.0 Credits
Covers mechanisms of pathogenesis in microbial disease: transmission, prevention, public health. Also covers molecular basis of microbial pathogenesis.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (BIO 218 [Min Grade: D] or BIO 211 [Min Grade: D]) and BIO 221 [Min Grade: D]

BIO 323 Parasitology 3.0 Credits
Parasitology explores the most predominant lifestyle on earth, parasitism. Students will learn how parasites invade and exploit their hosts, the resultant damage to the hosts, and the mechanisms by which hosts defend and protect themselves from these invaders.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 211 [Min Grade: D]

BIO 329 Dictyostelium Research 3.0 Credits
We will be developing and progressing molecular and cellular projects to study cellular function in Dictyostelium discoideum as a model to investigate human cellular dysfunction. This exploratory and experimental course is designed to provide opportunities for students to experience authentic laboratory investigation in the context of a course which runs like a research group. Projects progress from term to term so students are welcome to continue in subsequent terms to further progress their projects or switch to other ongoing projects.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Prerequisites: BIO 219 [Min Grade: D] (Can be taken Concurrently)BIO 209 [Min Grade: D]

BIO 331 Bioinformatics I 3.0 Credits
This course uses a combination of lecture and hands-on exercises to develop computational, algorithmic, and database navigation skills used in the analysis of genes and genomes. Topics include genomic databases, genome assembly and annotation, sequence alignment, phylogenetics, and comparative genomics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 122 [Min Grade: D] or BIO 141 [Min Grade: D]

BIO 332 Bioinformatics II 3.0 Credits
This course uses a combination of lecture and hands-on exercises to develop programming and software skills used in the study of functional genomics. Topics include genetics, transcriptomics, proteomics, and metabolomics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 331 [Min Grade: D]

BIO 333 Bioinformatics Laboratory 2.0 Credits
In this course, students develop and apply computational skills in bioinformatics to address a quarter-long research project. Topics generally focus on the ecology and evolution of microbes, which have become much easier to study thanks to the advent of molecular tools and software for the analysis of DNA sequences.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 122 [Min Grade: D] (Can be taken Concurrently) or BIO 141 [Min Grade: D]

BIO 346 Stem Cell Research 3.0 Credits
This course will focus on recent and important topics relevant to stem cell research and development. Topics will include nuclear reprogramming and epigenetics, environmental influences on stem cell differentiation, stem cells and cancer, stem-cell-based therapies for heart and neurodegenerative disorders, stem cells and ageing, and politics of stem cell research.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 218 [Min Grade: D] or BIO 211 [Min Grade: D]

BIO 348 Neuroscience: From Cells to Circuits 3.0 Credits
This courses provides an introduction to the biological basis of human and animal behavior. This course will emphasize fundamental aspects of neuroscience including how individual neurons respond to stimuli, how these neurons connect to form circuits during development, and how ensembles of neurons work together to mediate simple tasks.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 122 [Min Grade: D] or BIO 100 [Min Grade: D] or BIO 107 [Min Grade: D]

BIO 349 Behavioral Neuroscience 3.0 Credits
This course provides an introduction to the biological basis of human and animal behavior. This course will emphasize fundamental aspects of neuroscience with a focus on the principles of how circuits function in the nervous system. Topics covered will include how neural circuits mediate sensory perception, drive behavioral output, and generate thoughts and emotions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 122 [Min Grade: D] or BIO 100 [Min Grade: D] or BIO 107 [Min Grade: D]

BIO 368 Embryology 4.0 Credits
This course surveys general features of developing systems, and focuses on the developmental history of adult structures and functions in humans. Human developmental defects are also discusses.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 214 [Min Grade: D] or BIO 224 [Min Grade: D] or BIO 211 [Min Grade: D]

BIO 372 Histology 4.0 Credits
This course is designed to give students an understanding of the established fundamentals and principles of histology. Histology lies at the interface between cell biology and physiology: here we examine how cells work together as tissues and organs to create a functional pump (the heart), filters (the kidneys), and bellows (the lungs). While considerable focus will be on the structural details of select systems, there are recurring patterns that emerge in tissue construction. These patterns reflect regional variations in the functional role of the assembled tissue; studying these principles offers us a view of how small differences in cell number, type, and interaction can lead to the wide variety of tissue/organ properties seen in the human body.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 214 [Min Grade: D] or BIO 211 [Min Grade: D]

BIO 373 Developmental Biology 3.0 Credits
Covers molecular, cellular and physiological mechanisms underlying development of animals from gametes to adults. Covers the major stages and selected aspects of vertebrate development in importance animal model systems. Particular focus in on the importance of differential gene expression and its regulation in development.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 211 [Min Grade: D] or (BIO 214 [Min Grade: D] and BIO 218 [Min Grade: D])

BIO 374 Developmental Biology Lab 2.0 Credits
Includes observations into development processes in a diverse group of organisms including developmental principles in simple multicellular protests, gametogenesis in diverse animal, fertilization in sea urchins, embryonic development of vertebrates, regeneration of planarians, and the role of gene regulation in fruit fly development. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 373 [Min Grade: D] (Can be taken Concurrently) or BIO 270 [Min Grade: D]

BIO 386 Gross Anatomy I 2.0 Credits
This course is to give students an understanding of Human Anatomy in a clinical format. Anatomy will be studied in a regional manner with an emphasis placed on landmarks and relationships of structure within a region. Regions covered to include the back, upper limb, thorax, and abdomen.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: (BIO 214 [Min Grade: D] and BIO 218 [Min Grade: D]) or BIO 211 [Min Grade: D]
Corequisite: BIO 387

BIO 387 Gross Anatomy I Laboratory 2.0 Credits
This course is to accompany the Gross Anatomy lecture course and complements the students study of human anatomy by allowing the student to hone their dissection skills through dissection of a preserved mammalian specimen.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: (BIO 214 [Min Grade: D] and BIO 218 [Min Grade: D]) or BIO 211 [Min Grade: D]
Corequisite: BIO 386

BIO 388 Gross Anatomy II 2.0 Credits
This course is a continuation of the clinically focused study of Human Anatomy begun in BIO 386 (Gross Anatomy I). Anatomy will be studied in a regional fashion, with a focus on the pelvis, lower limb, head, and neck.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: (BIO 386 [Min Grade: D])
Corequisite: BIO 389

BIO 389 Gross Anatomy II Lab 2.0 Credits
This course is to accompany the Gross Anatomy lecture course and complements the students study of human anatomy by allowing the student to hone their dissection skills through dissection of a preserved mammalian specimen. This course is a direct continuation of BIO 387 (Gross Anatomy I Lab).
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 387 [Min Grade: D]
Corequisite: BIO 388

BIO 404 Structure and Function of Biomolecules 4.0 Credits
Covers the weak interactions which govern structure and function of biomolecules, including amino acids, proteins (structural organization, isolation, and methods of analysis). Enzymes (structure, catalytic mechanisms, kinetics), lipids and biomembranes, and DNA and RNA folding.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 242 [Min Grade: D]

BIO 410 Advanced Molecular Biology 3.0 Credits
This course will provide students the opportunity to learn about molecular mechanisms of gene expression and control, genome analysis and manipulation, and the use of advanced tools and techniques in molecular biology. The principles of molecular biology and techniques will be discussed in the context of model organisms commonly used for molecular biology research. The course will have a strong focus on experimental approaches, problem solving and on understanding literature in the field. At the conclusion of the course, students should have the background to design experiments, and read and discuss papers from the primary literature regarding different aspects of molecular biology.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 211 [Min Grade: D]

BIO 412 Biology of Aging 3.0 Credits
Discusses ageing at the organismal, organ, cellular, and molecular levels. Discussions include chronological verses biological aging, normal and abnormal human physiology of aging, current theories of aging, the effect of caloric restriction on aging, and the molecular mechanisms that underlie normal and abnormal aging.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 218 [Min Grade: D] or BIO 211 [Min Grade: D]

BIO 413 Genomics 3.0 Credits
This course aims to elucidate current technologies, theory, and applications of genomic research. Though a large emphasis will be placed on the use of genomic tools to study human health, we will also study the genomes, transcriptomes, and proteomes of bacteria, fungi, plants, and other animals.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 218 [Min Grade: D] or BIO 211 [Min Grade: D]

BIO 414 Behavioral Genetics 3.0 Credits
This course explores the role of genetics in determining variation in animal (including human) behavior, and the role of gene expression in regulating behavioral development. The course surveys techniques for quantifying and analyzing genetic variation, behavioral effects, and gene expression.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: BIO 122 [Min Grade: D] or BIO 107 [Min Grade: D]

BIO 415 Proteins 3.0 Credits
Discusses protein structure, function, and isolation. Emphasizes biochemical, biophysical, and molecular biological techniques.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 214 [Min Grade: D] or BIO 211 [Min Grade: D]

BIO 416 Biochemistry of Major Diseases 3.0 Credits
This course focuses on the biochemical bases of several selected human disorders including neoplasm, cardiovascular disorders, diabetes and obesity. Biochemical changes ant their regulation by signaling pathways under the disease conditions will be examined. The relevance of diagnosis and treatment will be discussed.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 203 [Min Grade: C] or BIO 311 [Min Grade: C]

BIO 420 Virology 3.0 Credits
Discusses the major viral groups, including biochemistry and molecular genetics of viral replication, structure, gene expression, latency, and role in disease.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 218 [Min Grade: D] or BIO 211 [Min Grade: D]

BIO 421 Biomembranes 3.0 Credits
The experimental and theoretical basis for the structure and function of biological membranes will be surveyed. Topics include membrane self assembly, bilayer phase behavior and dynamics, membrane protein structure, passive and active transport, membrane fusion and trafficking.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 214 [Min Grade: D] or BIO 211 [Min Grade: D]

BIO 426 Immunology 3.0 Credits
Covers the fundamental concepts of innate and adaptive immunity, including the molecular and cellular mechanisms that generate responses to a broad spectrum of infectious threats, self-non-self recognition, immune regulation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 214 [Min Grade: D] or BIO 211 [Min Grade: D]

BIO 427 Immunology Laboratory 2.0 Credits
Students will gain a more thorough understanding of the complexities of the mammalian immune system and will receive hands on experience with common models used in immunology labs. This course complements the Immunology lecture course (BIO 426). Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 426 [Min Grade: D] (Can be taken Concurrently)

BIO 430 Cell Biology of Disease 3.0 Credits
An introduction to the pathobiology of human disease as it relates to principles of cytoskeleton and membrane biology. The course reviews basic intracellular mechanisms and examines how they go awry in respiratory, heart and kidney diseases, diabetes, cancer, neurodegeneration and during viral and microbial infections.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 214 [Min Grade: D] or BIO 211 [Min Grade: D]

BIO 433 Advanced Cell Biology 3.0 Credits
Course covers chemical composition and cellular function of organelles and other cellular structures, intra- and inter- cellular regulatory processes, intercellular communication, genetic mechanisms and analytical techniques.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is BIO.
Prerequisites: BIO 214 [Min Grade: D] or BIO 211 [Min Grade: D]

BIO 434 [WI] Advanced Cell Biology Laboratory 2.0 Credits
Course covers fundamentals of growth, division and homeostasis of mammalian cells grown in culture. Students perform experiments on cells to monitor cellular morphology, including subcellular structures and specific regulatory proteins. Techniques include fluorescent microscopy, cell transfection and subcellular fractionation. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is BIO and classification is Senior.
Prerequisites: BIO 433 [Min Grade: D] (Can be taken Concurrently)

BIO 435 Immunobiology of Disease 3.0 Credits
This course will expand on the concepts of molecular immunology focusing on emerging concepts in immunology research, immunopathologies, failure of host defense and current clinical concepts.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 426 [Min Grade: D]

BIO 436 Population Genetics 4.0 Credits
This course surveys population genetics theory as applied to studies of micro-evolutionary changes. We will examine the forces of evolution—mutation, selection, inbreeding, gene flow, genetic drift—and how they can (and cannot) change allele frequencies in populations over time. We will apply the theory that you have learned by also examining current primary literature on human evolutionary history, population genetics and patterns of adaptation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 122 [Min Grade: D] and BIO 124 [Min Grade: D] and (BIO 211 [Min Grade: D] or BIO 217 [Min Grade: D] or BIO 218 [Min Grade: D] or ENVS 212 [Min Grade: D])

BIO 444 Human Genetics 3.0 Credits
Covers the fundamentals and principles of genetics with an emphasis on their relevance to human genetics and disease. Topics include human genetic disorders, pedigree analysis and genetic testing, cytogenetics, epigenetics, genetics if cancer, gene therapy, stem cell research, human genomics and biotechnology.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 218 [Min Grade: D] or BIO 211 [Min Grade: D]

BIO 447 Advanced Genetics and Molecular Biology 3.0 Credits
Covers classical prokaryotic and eukaryotic genetics; DNA/RNA structure; DNA replication, transcription, translation and regulation of these processes. Also covers major molecular techniques used for characterizing prokaryotic and eukaryotic genes, tools for analysis of genomes, and applications of molecular genetics research.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (BIO 218 [Min Grade: D] or BIO 211 [Min Grade: D]) and (BIO 244 [Min Grade: D] or BIO 444 [Min Grade: D])

BIO 449 Recombinant DNA Laboratory 5.0 Credits
Covers procedures of DNA isolation and purification, insertion of DNA sequences into plasmid cloning vectors, introduction of plasmids into appropriate host cells, and methods of recovering and analyzing cloned DNA.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 218 [Min Grade: D] or BIO 211 [Min Grade: D]

BIO 451 Genetic Reg Development 3.0 Credits
Covers molecular and genetic control of morphogenesis and cellular differentiation. Focuses on differential gene function and the interaction between the nucleus and the cytoplasm.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 270 [Min Grade: D] or BIO 373 [Min Grade: D]

BIO 453 Protein Dysfunction in Disease 3.0 Credits
Proteins are essential for the function and health of the cell. Misfolded and damaged proteins are at the root of numerous human diseases, known collectively as conformational diseases. In this course we will examine cellular mechanisms involved in biosynthesis, folding and maintenance of proteins, and discuss how the failure of these mechanisms contributes to disease.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 214 [Min Grade: D] or BIO 211 [Min Grade: D]

BIO 461 Neurobiology of Autism Disorders 3.0 Credits
Autism disorders arise from changes in neurodevelopment that deeply affect how individuals interact with the world around them. As study of autism has increased over the past several decades, it has become clear that autism actually comprises a large, heterogeneous set of similar disorders, most of which are genetic in origin. In this class, we will study how neuronal cell biology is disrupted in known forms of autism, and how distinct forms of autism can arise from alterations in common cellular pathways. Further, we will discuss how these discoveries may lead to eventual treatments or cures.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 218 [Min Grade: D] or BIO 211 [Min Grade: D] or BIO 348 [Min Grade: D] or BIO 349 [Min Grade: D]

BIO 462 Biology of Neuron Function 3.0 Credits
Covers molecular and cellular mechanisms underlying neuron function. Topics include: molecular and cellular biology of neurons and neural development; molecular biology and physiology of sensory and motor neurons; molecular biology of muscle function; molecular and cellular basis of learning and memory in model organisms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 201 [Min Grade: D] or BIO 218 [Min Grade: D] or BIO 211 [Min Grade: D] or BIO 348 [Min Grade: D] or BIO 349 [Min Grade: D]

BIO 463 Molecular Mechanisms of Neurodegeneration 3.0 Credits
This is an advanced course on the current, primary literature in the area of neurodegeneration. Students are expected to be conversant in areas of Genetics, Cell Biology, Molecular Biology, Biochemistry, and Neurobiology. This is a discussion course based on reading current manuscripts from the primary literature. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 214 [Min Grade: D] or BIO 211 [Min Grade: D] or BIO 348 [Min Grade: D] or BIO 349 [Min Grade: D]

BIO 465 Neurobiology of Disease 3.0 Credits
The objective of the course is to provide a basic understanding of molecular and cellular biology of disorders of the human nervous system. Advances developed form experimental models that have armed clinicians and basic scientists with new tools for diagnosis and treatment of disease and injury will be presented.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 462 [Min Grade: D] or BIO 211 [Min Grade: D] or BIO 348 [Min Grade: D] or BIO 349 [Min Grade: D]

BIO 466 Endocrinology 4.0 Credits
Describes the classical hormones, their regulation and major clinical abnormalities. New directions in endocrinology, such as cellular regulation and cellular mediators of hormonal action are also considered. The major focus of the course will be on mammals, although some examples involving other vertebrates are included.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 214 [Min Grade: D] or BIO 211 [Min Grade: D]

BIO 468 Pathophysiology 4.0 Credits
This course is designed to give students an appreciation of the many ways to think about the diseased organism, with an emphasis on the cellular- and systems-level malfunctions that contribute to the disease state. Having established an understanding of the normal physiology of the system in question, we will investigate the underlying cause, origin, and symptoms of the pathophysiology, as well as exploring the successes and limitations of available treatment options. Considerable emphasis will be placed on the importance of model systems that mimic aspects of the diseased state, as well as the role epidemiological data plays in helping to clarify the genetic and environmental contributors.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: (BIO 214 [Min Grade: D] or BIO 211 [Min Grade: D]) and BIO 201 [Min Grade: D]

BIO 471 Seminar in Biological Sciences 2.0 Credits
Discusses and evaluates selected current topics in bioscience and biotechnology. Includes presentations by outside speakers.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is BIO and classification is Senior.
Prerequisites: BIO 218 [Min Grade: D] or BIO 211 [Min Grade: D]

BIO 472 Seminar in Biological Sciences 2.0 Credits
In the second term of senior seminar, we will continue to host professional seminars with speakers presenting current research in the various biological disciplines. Professional development sessions will be available that will be helpful to the student's maturation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is BIO and classification is Senior.
Prerequisites: BIO 471 [Min Grade: D]

BIO 473 [WI] Seminar in Biological Sciences 2.0 Credits
This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is BIO and classification is Senior.
Prerequisites: BIO 472 [Min Grade: D]

BIO 474 Thesis in Biology 2.0 Credits
Through this course, research-active students will engage in activities intended to help them develop a written thesis, and learn how to present their research effectively in both written and oral formats. Students will be encouraged to improve their skills in reading and analyzing the literature and their own data. Students will communicate their ideas through the development of a formal thesis, an in-class oral presentation, and a poster presentation. Seminar attendance will be a part of this course. Students must complete BIO 471 and 473 before registering for this course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is BIO and classification is Senior.
Prerequisites: BIO 473 [Min Grade: D] (Can be taken Concurrently)

BIO 497 Research 0.5-12.0 Credits
Provides guided research in biology, molecular biology, microbiology, cell or human physiology, genetics, biochemistry, or biotechnology.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

BIO I199 Independent Study in BIO 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

BIO I299 Independent Study in BIO 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

BIO I399 Independent Study in BIO 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

BIO I499 Independent Study in BIO 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

BIO T180 Special Topics in Bioscience & Biotechnology 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

BIO T280 Special Topics in Bioscience & Biotechnology 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

BIO T380 Special Topics in Bioscience & Biotechnology 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

BIO T480 Special Topics in Bioscience & Biotechnology 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Business Analytics

Courses

BSAN 260 Introduction to Business Analytics 4.0 Credits
This course introduces mathematical models that can be used to improve decision- making within an organization. Topics will include analytical tools such as optimization, simulation, and Visual Basic for Applications (VBA) for problem solving and decision support in all areas of business, including supply chain networks, operations, finance, economics, and marketing. Students will make extensive use of Excel and several spreadsheet based add-ins to solve real business problems, improve business processes, and help make important business decisions.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

BSAN 360 Programming for Data Analytics 4.0 Credits
The mission of this course is to immerse students in the technical challenges associated with contemporary data analytics as applied to business processes and data-driven decision making. To achieve this mission, the course will introduce modules covering the state of the art in the areas of R programming as applied to data analysis for business problems.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: (STAT 202 [Min Grade: C-] or STAT 206 [Min Grade: C-]) and BSAN 260 [Min Grade: C-]

BSAN 460 Business Analytics Senior Project 4.0 Credits
The senior project serves as a capstone for business analytics majors. The course provides an opportunity for students to develop a project that draws on their skills in the areas of data management, mathematical modeling, and statistical analysis to support data driven decision-making processes. Students often choose a project in the area of their second major (marketing, finance, etc.) and thus the project provides deeper insight into organizational decision-making in a functional area of business.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: BSAN 260 [Min Grade: C-] and MIS 343 [Min Grade: C-] and (BSAN 360 [Min Grade: C-] or MIS 349 [Min Grade: C-])

BSAN T180 Special Topics in BSAN 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

BSAN T280 Special Topics in BSAN 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

BSAN T380 Special Topics in BSAN 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

BSAN T480 Special Topics in BSAN 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

Business Statistics

Courses

STAT 201 Introduction to Business Statistics 4.0 Credits
This introductory first course in business statistics focuses on applications
of data analysis and statistics in business and economics. Topics covered
include descriptive statistics and graphical presentation, probability,
statistical inference, and simple regression analysis.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 102 [Min Grade: D] or MATH 121 [Min Grade: D] or
MATH 173 [Min Grade: D] or MATH 183 [Min Grade: D]

STAT 202 Business Statistics II 4.0 Credits
This second course in business statistics focuses on widely used data
analysis techniques in business and economics. Topics include two
sample procedures, categorical data analysis, analysis of variance,
regression analysis and other statistical applications as time permits.
Applications are covered through practical data analysis examples.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: STAT 201 [Min Grade: C]

STAT 205 Statistical Inference I 4.0 Credits
Commerce and Engineering students only. Covers descriptive statistics,
elementary probability theory, discrete and continuous random variables
and probability distributions, joint distribution functions, expected values,
statistical measures, sampling distributions, and point and interval
estimation.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: MATH 122 [Min Grade: D]

STAT 206 Statistical Inference II 4.0 Credits
Commerce and Engineering students only. Topics include hypothesis
testing, two sample procedures, analysis of variance models, regression
analysis, use of computer statistical programs and other statistical
applications as time permits.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: STAT 205 [Min Grade: D]

STAT 261 Statistics I 3.0 Credits
Studies methods for organizing and summarizing data, elementary
probability concepts, and important probability distributions and sampling
distributions. Introduces confidence interval estimation. Fall, Winter.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 183 [Min Grade: D]

STAT 262 Statistics II 3.0 Credits
Studies the principles and techniques of interval estimation and
hypotheses testing, and testing for means and proportions. Winter,
Spring.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: STAT 261 [Min Grade: D]

STAT 325 Six-Sigma Quality Implementation 4.0 Credits
Focuses on current theory and practice in Six-Sigma implementation for
quality monitoring and improvement. Topics include the dynamic nature
of quality, Six-Sigma implementation, and the roles of management in
planning and guiding quality efforts. The fundamentals of managerial and
statistical methods for quality monitoring and improvements are covered.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: STAT 201 [Min Grade: C-] or STAT 205 [Min Grade: C-]

STAT 331 Introduction to Data Mining for Business 4.0 Credits
This course introduces students to the fundamental ideas of data mining
methods, including dimension reduction, cluster, classification and
regression trees, and logistic regression. The emphasis is understanding
the application of methods rather than on mathematical and computational
foundations. All applications are business-oriented.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: STAT 202 [Min Grade: C-] or STAT 206 [Min Grade: C-]

STAT 335 Introduction to Experimental Design 4.0 Credits
The purpose of this course is to introduce the student to the fundamentals
of experimental design, including the planning, conducting, and analysis
of statistically designed experiments. Randomized, factorial, fractional
and Plackett-Burnam designs are covered with an emphasis on business
applications.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: STAT 202 [Min Grade: C-] or STAT 206 [Min Grade: C-]

STAT I199 Independent Study in STAT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

STAT I299 Independent Study in STAT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

STAT I399 Independent Study in STAT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

STAT I499 Independent Study in STAT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

STAT T180 Special Topics in STAT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

STAT T280 Special Topics in STAT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

STAT T380 Special Topics in STAT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

STAT T480 Special Topics in STAT 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

Chemical Engineering

Courses

CHE 211 Material and Energy Balances I 4.0 Credits
Covers elementary principles of chemical engineering, use of
stoichiometry and material and energy balances to analyze chemical
processing operations, and application to specific commercial processes.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 102 [Min Grade: D] and MATH 122 [Min Grade: D]
Corequisite: CHE 220

CHE 212 Material and Energy Balances II 4.0 Credits
Covers application of material and energy balances to analyze chemical
processing operations, with application to both small-scale and
commercial processes. Emphasis is on simultaneous solution of material
and energy balances and on time-dependent analysis.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 211 [Min Grade: D] and CHE 220 [Min Grade: D]
Corequisite: CHE 230

**CHE 220 Computational Methods in Chemical Engineering I 3.0
Credits**
Introduces computational approaches and software applied to solve
problems in chemical engineering. Software includes spreadsheet
programs (Excel), high level computing languages (MATLAB), and
chemical process simulation tools (Aspen, HYSYS).
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ENGR 111 [Min Grade: D] and MATH 122 [Min Grade: D]
and CHEM 102 [Min Grade: D]
Corequisite: CHE 211

CHE 230 Chemical Engineering Thermodynamics I 4.0 Credits
First and second laws of thermodynamics, use of state functions to solve
macroscopic problems, distinction between solving ideal gas and real fluid
problems. An introduction to phase equilibrium and mixtures. Concepts of
fugacity and activity as measures of nonideality.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MATH 200 [Min Grade: D] and CHE 211 [Min Grade: D]
and CHE 220 [Min Grade: D]
Corequisite: CHE 212

CHE 304 Process Mass Transfer 4.0 Credits
Covers, within the context of processes previously introduced, mass
transfer in mixtures; diffusion, convection, and continuation of transport
phenomena; component separation in continuous contractors; gas
absorption; liquid-liquid extraction; and simultaneous heat and mass
transfer.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHE 303 [Min Grade: D] and (CHE 201 [Min Grade: D] or
CHE 211 [Min Grade: D]) and (CHE 202 [Min Grade: D] or CHE 212 [Min
Grade: D])

CHE 308 Process Modeling II 4.0 Credits
Covers mathematical modeling of chemical and biochemical processes
such as chemical and biochemical reactors and heating and cooling
systems, analytical methods for solving algebraic and ordinary-differential
equations.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 305 [Min Grade: D] and CHE 307 [Min Grade: D]

**CHE 320 Computational Methods in Chemical Engineering II 3.0
Credits**
This course introduces computational approaches and software applied
to solve problems in chemical engineering. The course includes
finite element software for solving differential equations (COMSOL
Multiphysics) and computer programming.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 341 [Min Grade: D]

CHE 330 Chemical Engineering Thermodynamics II 4.0 Credits
Covers mixture thermodynamics, multi-component, multi-phase
equilibrium calculations, and chemical equilibrium calculations for real
fluids.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 230 [Min Grade: D]

CHE 331 Separation Processes 3.0 Credits
Covers application of thermodynamics and equilibrium stage concepts to
separation unit operations in chemical processing.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 330 [Min Grade: D] and CHE 343 [Min Grade: D]

CHE 341 Fluid Mechanics 4.0 Credits
Introduces, within the context of processes, transport phenomena, fluid flow, momentum transport, skin friction, drag, and piping networks.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 212 [Min Grade: D] and CHE 230 [Min Grade: D] and MATH 210 [Min Grade: D]

CHE 342 Heat Transfer 4.0 Credits
Covers, as a continuation of transport phenomena and within the context of processes, transfer of energy by conduction, convection, and radiation and design of heat exchangers.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 341 [Min Grade: D]
Corequisite: CHE 343

CHE 343 Mass Transfer 4.0 Credits
Covers, within the context of processes previously introduced, mass transfer in mixtures; diffusion, convection, and continuation of transport phenomena; component separation in continuous contactors; gas absorption; liquid-liquid extraction; and simultaneous heat and mass transfer.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 341 [Min Grade: D]
Corequisite: CHE 342

CHE 344 Transport Phenomena in Bioengineering Processes 3.0 Credits
Covers gas-liquid mass transfer in microbial systems, mass transfer in cells and biofilms, membrane transport, fluid mechanics of fermentation broth, power consumption in agitated vessels, heat transfer, and scale-up of mass transfer equipment.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (CHE 343 [Min Grade: D] or CHE 304 [Min Grade: D]) and (CHE 341 [Min Grade: D] or CHE 302 [Min Grade: D])

CHE 350 Statistics and Design of Experiments 3.0 Credits
Provides statistical treatment of engineering data including application of statistical techniques to process model formulation, statistical designs of engineering experiments, and analysis of probabilistic systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MATH 210 [Min Grade: D] or ENGR 232 [Min Grade: D] or MATH 262 [Min Grade: D]

CHE 351 Chemical Engineering Laboratory I 2.5 Credits
Offers laboratory experience in chemical engineering processes, requiring both experimental design and analysis. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 341 [Min Grade: D] and CHE 330 [Min Grade: D]

CHE 352 Chemical Engineering Laboratory II 2.5 Credits
Offers laboratory experience in chemical engineering processes, requiring both experimental design and analysis. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 343 [Min Grade: D] and CHE 331 [Min Grade: D]

CHE 360 BioProcess Principles 3.0 Credits
This course is concerned with manufacturing processes involving biological substances. Students gain detailed knowledge in the design and operation of bioreactors and learn about biomolecules produces therein. Specific topics covered include: Cells (type, organization, function and growth); Protein and Enzymes; Bioreactor Process Principles (active vs. passive immobilization, fermentation and scale-up, recovery and purification); Special consideration for animal and plant cell cultures.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 211 [Min Grade: D] or CHE 201 [Min Grade: D]

CHE 362 Chemical Kinetics and Reactor Design 4.0 Credits
Covers isothermal and non-isothermal reactor design, series and parallel reactions, and heterogeneous catalysis.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 330 [Min Grade: D] and CHE 342 [Min Grade: D] and CHE 343 [Min Grade: D]

CHE 364 Bioprocess Unit Operations 3.0 Credits
Covers separation processes applicable to bio-systems, including liquid-liquid extractions, membrane separations, chromatographic separations, filtration, and centrifugation.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 305 [Min Grade: D] or CHE 331 [Min Grade: D]

CHE 371 Engineering Economics and Professional Practice 3.0 Credits
Provides techniques for making engineering project decisions. Topics include the time value of money, key decision criteria, risk analysis, and ethical considerations and consequences of business decisions.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 211 [Min Grade: D] and CHE 220 [Min Grade: D]

CHE 372 Integrated Case Studies in Chemical Engineering 3.0 Credits
This course reviews selected cases (market, processes, equipment sets and incidents) from chemical engineering practice whose analysis requires integration of concepts from previous Chemical Engineering courses such as mass and energy transport, thermodynamics, separations and reaction engineering.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 342 [Min Grade: D] and CHE 343 [Min Grade: D]

CHE 373 The Brewing Process 3.0 Credits
This course will focus on the critical process steps which make up the brewing process on any scale with special attention to the chemistry and biochemistry of the involved process steps. The lecture material includes the brewing process steps from raw materials to fill/finish including: raw materials, malting, mashing, lautering, boiling, hopping, fermentation, clarification (filtration/centrifugation/flocculation), and fill/finish, as well as a discussion of the fundamentals, impurities chemistry, health concerns and practical knowledge.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 242 [Min Grade: D]

CHE 399 Special Problems in Chemical Engineering 1.0-12.0 Credit
Covers individual research problems of a non-routine nature. Requires report.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

CHE 420 Process Systems Engineering 3.0 Credits
Covers the application of automatic control theory to chemical processes within the context of processes previously introduced.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (CHE 201 [Min Grade: D] or CHE 211 [Min Grade: D]) and (CHE 202 [Min Grade: D] or CHE 212 [Min Grade: D]) and CHE 303 [Min Grade: D]

CHE 424 Chemical Kinetics and Reactor Design 4.0 Credits
Covers isothermal and non-isothermal reactor design, series and parallel reactions, and heterogeneous catalysis.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHE 304 [Min Grade: D] and (CHE 201 [Min Grade: D] or CHE 211 [Min Grade: D]) and (CHE 202 [Min Grade: D] or CHE 212 [Min Grade: D])

CHE 430 Introduction to Sustainable Engineering 3.0 Credits
This course introduces students to sustainability in an engineering context. Sustainable engineering encompasses the relationships between technology, society, the environment, and economic prosperity. A variety of systematic approaches will be used for multivariable design and analysis of the sustainability of engineering systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

CHE 431 Fundamentals of Solar Cells 3.0 Credits
This course focuses on the fundamentals of solar cells. It will cover semiconductor materials, basic semiconductor physics, optical and electronic phenomena, and case studies of crystalline silicon, thin film, and nanostructured photovoltaics.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MATH 200 [Min Grade: D] and CHEM 102 [Min Grade: D] and PHYS 201 [Min Grade: D]

CHE 432 Electrochemical Engineering 3.0 Credits
This course introduces principles and application of electrochemical equilibria, kinetics, and transport processes.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 330 [Min Grade: D] and CHE 343 [Min Grade: D]

CHE 433 Introduction to Rheology 3.0 Credits
Introduces the concepts of how science defines and conceptualizes the behavior of "real" fluids. Covers concepts such as how to characterize, quantify, and simulate non-newtonian behavior in real fluids.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 341 [Min Grade: D] or CHE 302 [Min Grade: D]

CHE 450 Chemical Process Industries 3.0 Credits
Chemical engineering juniors and seniors. Combines process heuristics and design strategies with case studies of the industrial manufacture of a variety of materials, including petrochemicals, polymers, and ammonia. Discusses operational and design problems as well as the interactions of process principles.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore

CHE 451 Safety Engineering 3.0 Credits
Covers selected topics such as safeguarding systems, fault trees, risk analysis, explosions, fires, and building safety.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: CHE 482 [Min Grade: D]

CHE 452 Polymer Process Technology 3.0 Credits
Covers chemistry of chain and stepwise polymerization, industrial reactor systems, polymer melt rheology, processing of thermoplastic resins, and plastics properties.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

CHE 453 Chemical Engineering Laboratory III 2.5 Credits
Offers laboratory experience in chemical engineering processes, requiring both experimental design and analysis.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 362 [Min Grade: D], CHE 464 [Min Grade: D] (Can be taken Concurrently)

CHE 460 Biochemical Engineering 3.0 Credits
Introduces underlying biological and engineering principles in an integrate fashion for biopharmaceutical production systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is BME or major is CHE and classification is Junior or Senior.

CHE 461 Principles of Colloid Science 3.0 Credits
This course focuses on fundamental principles of colloid science from a biological perspective. It will cover surface active agents, thermodynamics of self-assembly of surfactants, surface chemistry and physics of monolayers and bilayers, microstructures and phase behavior, specific biological colloids (micelles, liposomes, and lipoproteins), and colloidal stability.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: BIO 141 [Min Grade: C] or BIO 122 [Min Grade: C]

CHE 464 Process Dynamics and Control 3.0 Credits
Covers the application of automatic control theory to chemical processes within the context of processes.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MATH 210 [Min Grade: D] and CHE 212 [Min Grade: D]

CHE 466 Chemical Process Safety 3.0 Credits
Covers selected topics such as safeguarding systems, fault trees, risk analysis, explosions, fires, and process safety.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 472 [Min Grade: D]

CHE 471 Process Design I 4.0 Credits
Within the context of previously introduced processes, covers economic feasibility of projects and optimization of equipment and production in the design of process plants.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 331 [Min Grade: D], CHE 362 [Min Grade: D] (Can be taken Concurrently)CHE 371 [Min Grade: D] and CHE 372 [Min Grade: D]

CHE 472 Process Design II 3.0 Credits
Within the context of previously introduced processes, covers execution of feasibility study and preliminary design of process plants. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 471 [Min Grade: D]

CHE 473 Process Design III 3.0 Credits
Within the context of previously introduced processes, covers completion of feasibility study and preliminary design of process plants. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE 472 [Min Grade: D]

CHE 481 Process Design I 3.0 Credits
Within the context of previously introduced processes, covers economic feasibility of projects and optimization of equipment and production in the design of process plants.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CHE and classification is Senior.
Prerequisites: CHE 304 [Min Grade: D] and CHE 308 [Min Grade: D]
Corequisite: CHE 424

CHE 482 [WI] Process Design II 3.0 Credits
Within the context of previously introduced processes, covers execution of feasibility study and preliminary design of process plants. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: CHE 481 [Min Grade: D]

CHE 483 [WI] Process Design III 3.0 Credits
Within the context of previously introduced processes, covers completion of feasibility study and preliminary design of process plants. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: CHE 482 [Min Grade: D]

CHE 498 Senior Thesis Research 3.0 Credits
This course teaches students the ability to structure and write a thesis and defend their research.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHE I499 [Min Grade: D]

CHE I199 Independent Study in CHE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consulation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CHE I299 Independent Study in CHE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consulation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CHE I399 Independent Study in CHE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consulation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CHE I499 Independent Study in CHE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consulation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CHE T180 Special Topics in CHE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CHE T280 Special Topics in CHE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CHE T380 Special Topics in CHE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CHE T480 Special Topics in CHE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

Chemical Engineering Chemistry

Courses

CHEC 352 Physical Chemistry and Applications II 4.0 Credits
Equilibrium electrochemistry and transport; Covers electrochemical cells, Nernst equation, fuel cells, batteries, electrolytic solutions, transfer processes, Fick's laws, diffusion, ion transport, introduction to simple quantum mechanical systems.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 201 [Min Grade: D] and (CHE 206 [Min Grade: D] or ENGR 210 [Min Grade: D] or CHEM 253 [Min Grade: D])

CHEC 353 Physical Chemistry and Applications III 4.0 Credits
Kinetics and spectroscopy; Covers reaction kinetics, steady state approximation, chain reactions and unimolecular reactions, optical spectroscopy; Beer's Law, atomic spectra/simple atomic models, rotational and vibrational spectra, Raman spectra, term symbols and selection rules, lasers, molecular statistics, partition functions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 201 [Min Grade: D] and (CHE 206 [Min Grade: D] or ENGR 210 [Min Grade: D])

CHEC I199 Independent Study in CHEC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CHEC I299 Independent Study in CHEC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CHEC I399 Independent Study in CHEC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CHEC I499 Independent Study in CHEC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CHEC T180 Special Topics in Chemical Engineering Chemistry 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CHEC T280 Special Topics in Chemical Engineering Chemistry 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CHEC T380 Special Topics in Chemical Engineering Chemistry 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CHEC T480 Special Topics in Chemical Engineering Chemistry 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Chemistry

Courses

CHEM 050 Preparatory Chemistry 0.0 Credits
This online course covered general chemical principles, such as stoichiometry, atomic and molecular structure, and characterization of chemical reactions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CHEM 100 Chemistry 2.0 Credits
Chemistry and its significance to industry and life, with discussions revolving around synthesis and use of polymers and biologically significant molecules.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CHEM 101 General Chemistry I 3.5 Credits
Covers fundamental principles of chemistry, stoichiometry, atomic and molecular structure, chemical bonding, states of matter, thermochemistry, and periodicity.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: APCH 12 or CHEM 111 [Min Grade: D] or CHEM 050 [Min Grade: D]
Corequisite: EXAM 080

CHEM 102 General Chemistry II 4.5 Credits
Covers chemical equilibrium, including acid-base equilibria in solution; electrochemistry; organic chemistry; polymers; and petroleum.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 101 [Min Grade: D] or CHEM 121 [Min Grade: D] or CHEM 161 [Min Grade: D]
Corequisite: EXAM 080

CHEM 103 General Chemistry III 5.0 Credits
Covers organic functional groups, biochemistry, inorganic and coordination compounds, chemical kinetics, thermodynamics, and nuclear chemistry.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 102 [Min Grade: D] or CHEM 122 [Min Grade: D] or (CHEM 162 [Min Grade: D] and CHEM 164 [Min Grade: D])
Corequisite: EXAM 080

CHEM 108 Health Chemistry I 3.0 Credits
Covers physical and chemical properties of substances used in medical areas and related principles: atomic structure, bonding, gases, solutions, acids and bases, oxidation-reduction and the chemistry of hydrocarbon compounds and polymers. Examples are taken from pharmacology, nutrition and other allied health fields.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: EXAM 080

CHEM 110 Environmental Chemistry 2.0 Credits
Chemistry of the environment; the ecological aspects. Discussion of problems related to the pollution of the atmosphere, natural waters, and soil from a chemist's point of view.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CHEM 111 General Chemistry I 4.0 Credits
Not open to engineering or science majors. Introduces the principles of general chemistry. Covers SI units, unit factor calculations, states of matter, elements and compounds, energy, atoms, electronic configurations, ionic and covalent bonds, Lewis dot structures, shapes of molecules, chemical equations, stoichiometry, molarity, gas laws, nuclear chemistry, equilibrium between different states of matter, and some colligative properties of solutions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: EXAM 080

CHEM 112 General Chemistry II 4.0 Credits
Introduces organic chemistry. Covers some classes of organic compounds from alkanes to amines, basic reactions of important functional groups, uses of some compounds, stereochemistry, synthetic and natural polymers (carbohydrates, protein, DNA), and briefly acids and bases.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 111 [Min Grade: D]

CHEM 113 General Chemistry I Laboratory 1.5 Credit
Covers chemical and physical properties and techniques for inorganic, organic, and polymeric compounds, including distillation, crystallization, chromatography, separation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 111 [Min Grade: D] (Can be taken Concurrently)

CHEM 114 General Chemistry II Laboratory 1.5 Credit
Continuation of CHEM 113.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 112 [Min Grade: D] (Can be taken Concurrently)

CHEM 121 Majors Chemistry I 5.0 Credits
Part I in an introductory sequence for chemistry majors. Covers fundamental principles of atomic and molecular nature of matter, electronic structure, physic-chemical properties, periodicity, chemical reactions, stoichimoetry, thermochemistry, chemical bonding, properties of gases, and nuclear chemistry. Course includes weekly lab experiments.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CHEM.
Prerequisites: APCH 12 or CHEM 111 [Min Grade: D] or CHEM 050 [Min Grade: D]

CHEM 122 Majors Chemistry II 5.0 Credits
Part II in an introductory sequence for chemistry majors. Covers physical properties of liquids and solids, kinetics, equilibrium, solutions, acids and bases, thermodynamics, and electrochemistry. Course includes weekly lab experiments.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CHEM.
Prerequisites: CHEM 101 [Min Grade: C-] or CHEM 121 [Min Grade: C-]

CHEM 123 Majors Chemistry III 5.5 Credits
Part III in an introductory sequence for chemistry majors. Course covers physical and chemical properties of substances used in consumer products through an introduction to fundamental structures, nomenclature and properties of hydrocarbons, organize functional groups, polymers and biomolecules. Course includes weekly lab experiments.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CHEM.
Prerequisites: CHEM 102 [Min Grade: C-] or CHEM 122 [Min Grade: C-]

CHEM 151 Applied Chemistry 3.0 Credits
For business majors. Covers physical and chemical properties of substances used in consumer products. Provides qualitative introduction to required principles, including atomic structure and the elements, bonding and compounds, and the chemistry of carbon compounds and polymers. Uses examples from the areas of food and nutrition, pharmacology, and the petrochemical industry.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: EXAM 080

CHEM 161 General Chemistry I 3.0 Credits
Covers atomic structure, stoichiometry, gases, valence theory, and thermochemistry.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 003 [Min Grade: D] or (MATH 001 [Min Grade: D] and MATH 002 [Min Grade: D])

CHEM 162 General Chemistry II 3.0 Credits
Covers solutions, colligative properties, chemical equilibrium, and electrochemistry. Introduces organic chemistry.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 161 [Min Grade: D] or CHEM 101 [Min Grade: D]

CHEM 163 General Chemistry III 3.0 Credits
Continues organic chemistry. Introduces thermodynamics, molecular biology, inorganic chemistry, chemical kinetics, and nuclear chemistry.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 164 [Min Grade: D] and CHEM 162 [Min Grade: D]

CHEM 164 General Chemistry Laboratory I 2.0 Credits
Involves experiments demonstrating the principles of gas behavior, thermochemistry, colligative properties, chemical equilibrium, and electrochemistry. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 162 [Min Grade: D] (Can be taken Concurrently)

CHEM 165 General Chemistry Laboratory II 2.5 Credits
Involves experiments illustrating the principles of organic separations, transition metal chemistry, complex ions, chemical kinetics, and qualitative analysis. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 163 [Min Grade: D] (Can be taken Concurrently)

CHEM 201 Why Things Work: Everyday Chemistry 3.0 Credits
Course will cover chemical explanations of everyday materials and phenomena. The focus will be conceptual understanding, as opposed to a detailed quantitative treatment.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CHEM 230 Quantitative Analysis 4.0 Credits
Covers chemical analysis and data treatment, including chemical equilibrium, acid-base and redox reactions, and applications to gravimetric and titrimetric methods.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 102 [Min Grade: D] or CHEM 122 [Min Grade: D] or (CHEM 162 [Min Grade: D] and CHEM 164 [Min Grade: D])

CHEM 231 [WI] Quantitative Analysis Laboratory 2.0 Credits
Provides laboratory studies in quantitative analysis. This is a writing intensive course. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 230 [Min Grade: D] (Can be taken Concurrently)

CHEM 241 Organic Chemistry I 4.0 Credits
Covers structure, reactions, and stereochemistry of organic compounds, especially alkanes, cycloalkanes, haloalkanes, and alkenes. Also covers SN1, SN2, E1, and E2 compound.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 102 [Min Grade: D] or CHEM 122 [Min Grade: D] or (CHEM 162 [Min Grade: D] and CHEM 164 [Min Grade: D])

CHEM 242 Organic Chemistry II 4.0 Credits
Covers structure, reactivity, and stereochemistry of organic compounds, especially alkanes, alkynes, alcohols, ethers, dienes, and aromatic compounds. IR, MS, and NMR spectral techniques are introduced and applied to the identification of organic compounds.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 241 [Min Grade: D]

CHEM 243 Organic Chemistry III 3.0 Credits
Covers structure, preparation, reactivity, and stereochemistry of organic compounds, especially substituted aromatics, aldehydes, ketones, carboxylic acids, carboxylic acid halides, anhydrides, amides, polypeptides, esters, amines, phenols, and carbohydrates.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 242 [Min Grade: D]

CHEM 244 Organic Chemistry Laboratory I 3.0 Credits
Introduces simple recrystallization, distillation, extraction, and chromatography techniques and applies them to several organic reactions illustrative of topics covered in CHEM 241. Provides opportunity to take and interpret IR and GC spectra.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 241 [Min Grade: D]

CHEM 245 Organic Chemistry Laboratory II 3.0 Credits
Provides experiments illustrating a number of organic reactions covered in CHEM 242 as well as more advanced organic techniques. Provides opportunity to take and interpret IR and GC scans. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 242 [Min Grade: D] (Can be taken Concurrently)CHEM 244 [Min Grade: D]

CHEM 246 Organic Chemistry for Majors I 6.5 Credits
This course offers a basic foundation for modern organic chemistry. Lecture topics include: the chemistry of alkanes, cycloalkanes, alkyl halides, alkenes, cycloalkenes, and alkynes, free radical substitution, nucleophilic substitution, elimination, ionic addition, and free radical addition reactions. Lab topics include recrystallization, distillation, chromatography, liquid-liquid extraction, and simple chemical reactions, including an elimination reaction to prepare an alkene and several substitution reactions to prepare alkyl halides. Introduction to the use of IR and 1-H NMR as structure identification tools.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CHEM.
Prerequisites: CHEM 103 [Min Grade: D] or CHEM 123 [Min Grade: D]

CHEM 248 Organic Chemistry for Majors II 6.5 Credits
This course continues developing the basic foundation of modern organic chemistry started in CHEM 246. Lecture topics include the chemistry of alcohols, ethers, conjugated systems, aromatic compounds and thiols. The principles of IR, MS, 1-H and 13-C NMR will be taught in lecture and put to use in identifying products in the lab. Other lab topics include the preparation of alcohols, a Grignard synthesis, an alkene addition reaction, an aromatic nitration, a Friedel-Crafts reaction, the preparation of ferrocene, and how to safely handle water-sensitive chemicals.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CHEM.
Prerequisites: CHEM 246 [Min Grade: D] or (CHEM 241 [Min Grade: D] and CHEM 244 [Min Grade: D])

CHEM 249 Organic Chemistry for Majors III 7.0 Credits
This course completes development of the basic foundation of modern organic chemistry started in CHEM 246. Lecture topics include the chemistry of aldehydes, ketones, amines, carboxylic acids & their derivatives, carbohydrates, organometallic compounds, and multi-step organic synthesis. Asymmetric synthesis and C,C-bond forming reactions will also be covered. Lab topics include the multi-step syntheses of benzocaine and DEET, stereochemical inversion, diazonium coupling, Aldol condensation, sequential Diels-Alder and lactonization reactions, and the principles of functional group protection.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CHEM.
Prerequisites: CHEM 248 [Min Grade: D] or (CHEM 242 [Min Grade: D] and CHEM 245 [Min Grade: D])

CHEM 251 Physical Chemistry I 3.0 Credits
Introduces physical chemistry. Topics include quantum chemistry, operators, the uncertainty principle, deBroglie wavelength, particle in a box, hydrogen-like atoms, aufbau principle, commutators, normalization, LCAO-MO, variation principle, diatomic molecules, Heckel approximation, harmonic oscillator, conjugated systems, electronic and vibrational spectroscopy, and selection rules.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: (CHEM 102 [Min Grade: D] and MATH 200 [Min Grade: D]) or TDEC 121 [Min Grade: D] or (CHEM 162 [Min Grade: D] and CHEM 164 [Min Grade: D])

CHEM 253 Thermodynamics and Kinetics 4.0 Credits
Covers gas properties, gas laws, state functions, first, second, and third laws of thermodynamics, phase transformations, phase diagrams, chemical equilibrium, spontaneous reactions, Gibbs free energy, molecular motion, diffusion, rates of chemical reactions, rate laws, molecular reaction dynamics, transition states, electron transfer.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 102 [Min Grade: D] or CHEM 122 [Min Grade: D] or (CHEM 162 [Min Grade: D] and CHEM 164 [Min Grade: D]) and MATH 200 [Min Grade: D]

CHEM 256 Physical Chemistry for Biological Sciences 4.5 Credits
Covers elementary chemical thermodynamics and homogeneous reaction kinetics as bases for experiment and phenomenology in biology and biochemistry, including properties of molecules in solution.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 102 [Min Grade: D] or CHEM 122 [Min Grade: D] or (CHEM 162 [Min Grade: D] and CHEM 164 [Min Grade: D])

CHEM 270 Software Skills for Chemists 3.0 Credits
Course covers mathematical, computational, and professionals skills useful to chemists. Representation of chemical problems in mathematical language; use of software to: solve mathematical problems that arise in chemistry; process, analyze and present data; visualize and analyze molecular structures. Also covers the American Chemical Society guidelines for professionalism in chemistry.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 102 [Min Grade: D] or CHEM 122 [Min Grade: D] and (PHYS 201 [Min Grade: D] or PHYS 211 [Min Grade: D])

CHEM 346 Qualitative Organic Chemistry 5.5 Credits
Covers identification of pure organic compounds, physical constants, solubilities by semi-micro techniques, infrared and nuclear magnetic resonance spectroscopy, and separation and identification of mixtures.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHEM 243 [Min Grade: D] and CHEM 245 [Min Grade: D]

CHEM 355 Physical Chemistry IV 3.0 Credits
Computational methods of modeling molecules; Covers potential energy functions and surfaces, molecular conformations, failures of classical physics, the quantum hypothesis, the classical wave equation and the origins of the Schrodinger equation, particle-in-a-box, linear variation functions, molecular orbitals from linear combinations of atomic orbitals, Pauli principle, molecular calculations and their interpretation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: (CHEM 252 [Min Grade: D] or CHEM 253 [Min Grade: D]) and (CHEM 270 [Min Grade: D] or PHYS 160 [Min Grade: D]) and (MATH 201 [Min Grade: D] or MATH 210 [Min Grade: D]) and CHEC 352 [Min Grade: D]

CHEM 356 Physical Chemistry Laboratory 2.0 Credits
Provides experiments in physical chemistry for engineering students. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 241 [Min Grade: D] (Can be taken Concurrently)

CHEM 357 [WI] Physical Chemistry Laboratory I 2.5 Credits
Provides experiments illustrative of topics included in CHEM 251 and CHEC 352. This is a writing intensive course. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (CHEM 252 [Min Grade: D] or CHEM 253 [Min Grade: D]) and (PHYS 211 [Min Grade: D] or PHYS 201 [Min Grade: D]) or CHEC 352 [Min Grade: D]

CHEM 358 Physical Chemistry Laboratory II 2.5 Credits
Continues CHEM 357.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHEM 357 [Min Grade: D] and (CHEM 252 [Min Grade: D] or CHEM 253 [Min Grade: D] or CHEC 352 [Min Grade: D])

CHEM 359 Atomic and Molecular Spectroscopy 3.0 Credits
Emission and absorption of light, laser principles, optical spectrometers, atomic spectroscopy. LS-coupling, Zeeman effect, magnetic resonance spectroscopy, EPR, NMR, ENDOR, molecular spectroscopy of diatomic and polyatomic molecules, rotational, vibrational and electronic, fluorescence spectroscopy, two-photon spectroscopy, time resolved spectroscopy, photo-electron spectroscopy.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 355 [Min Grade: D]

CHEM 361 Advanced Organic Chemistry Laboratory 2.5 Credits
Emphasizes experimental design, data collection, and interpretation in such areas as reaction mechanism and molecular structure determination. Not offered every year.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHEM 243 [Min Grade: D] and CHEM 245 [Min Grade: D]

CHEM 364 Spectroscopic Analysis 3.0 Credits
Covers interpretation of spectra for the determination of structure of organic molecules. Stresses use of infrared, nuclear magnetic resonance, and mass spectrometry. Fall. Not offered every year.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHEM 243 [Min Grade: D]

CHEM 367 Chemical Information Retrieval 3.0 Credits
This course examines methods for retrieving literature information, via standard tabulations, journals, and abstracts, using both hard-copy and electronic sources. Includes techniques for online searching of databases such as Chemical Abstracts, Beilstein, and crystallographic depositories.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CHEM 371 Chemistry of Biomolecules 3.0 Credits
This course is a chemistry-based approach to understanding the basic structure, chemical reactivity, and biological function of biomolecules – including amino acids, peptides, proteins, carbohydrates, nucleic acids, and lipids. A special emphasis will be given to topics in the frontiers of biomolecular research at the interface between chemistry and biology.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 242 [Min Grade: D] or CHEM 248 [Min Grade: D]

CHEM 375 The Chemistry Behind Drugs: Fundamentals of Medicinal Chemistry 3.0 Credits
Covers basic concepts of general and organic chemistry that constitute the foundation of medicinal chemistry. Focuses on applications and problem-solving through active-learning. Offers a comprehensive overview of potential roles for science majors on a medicinal chemistry team. Students will make interdisciplinary connections, while applying nomenclature, stereochemistry and physicochemical properties of functional groups (e.g., water/lipid solubility, electronic effects, acidity/basicity, ionization and salt formation at physiological pH) to predict drug-target and drug-drug interactions, as well as drug metabolic pathways. Using structure-activity relationships and retrosynthetic analysis, students will then design ligands and prodrugs with virtually improved pharmacological action and bioavailability.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 243 [Min Grade: D], CHEM 249 [Min Grade: D] (Can be taken Concurrently) or (CHEM 242 [Min Grade: D] and CHEM 245 [Min Grade: D])

CHEM 420 Molecular Symmetry and Group Theory Applied Chemistry 3.0 Credits
Applies the principles of simple group theory to molecular structure and to electronic and motional properties of molecules, including crystal field and molecular orbital methods.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHEM 421 [Min Grade: D]

CHEM 421 Inorganic Chemistry I 3.0 Credits
Covers crystal, atomic, and molecular structure; modern chemical bonding; and magnetic properties of inorganic systems.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHEM 253 [Min Grade: D] (Can be taken Concurrently)CHEM 252 [Min Grade: D] or ENGR 210 [Min Grade: D]

CHEM 422 Inorganic Chemistry II 3.0 Credits
Covers organometallic and coordination compounds, substitution mechanisms, and bio-inorganic chemistry.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHEM 420 [Min Grade: D]

CHEM 424 Special Chemistry Problems 0.5-12.0 Credits
Allows theoretical and laboratory investigations of a particular problem of interest to the individual student. A written report may be required.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

CHEM 425 Inorganic Chemistry Laboratory 4.0 Credits
Covers synthesis of properties of inorganic compounds, magnetic measurements, spectroscopic properties, and interpretations of complex ion structure. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHEM 422 [Min Grade: D] (Can be taken Concurrently)

CHEM 430 Analytical Chemistry I 3.0 Credits
Provides an introduction to statistics (particularly the development and use of analytic calibration curves), basic electronics, and the principles of spectroscopic methods of analysis, including the interaction of light with matter and basic instrument design.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHEM 253 [Min Grade: D] (Can be taken Concurrently) (CHEM 230 [Min Grade: D] and CHEM 242 [Min Grade: D]) or CHEC 352 [Min Grade: D])

CHEM 431 [WI] Analytical Chemistry II 4.0 Credits
Continues CHEM 430. Covers principles of chromatographic methods of analysis. Lab includes experiments on atomic absorption, fluorescence, infrared absorption, UV/visible absorption, gas chromatography, high performance liquid chromatography, basic electronics, and potentiometry/coulometry. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHEM 430 [Min Grade: D] or ENGR 210 [Min Grade: D]

CHEM 465 Synthetic Polymer Chemistry 3.0 Credits
Explores scope of polymer science; structure-property relations; step, free radical, cationic, group-transfer, metathesis, coordination, and ring-opening polymerizations; and stereochemistry of polymerizations and reactions of polymers.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHEM 242 [Min Grade: D]

CHEM 466 Physical Chemistry of Polymers 3.0 Credits
Covers kinetics and thermodynamics of polymerizations; control of polymerization processes; gelation theory; copolymerization; and determination of polymer molecular weight and distribution by membrane osmometry, light-scattering, solution viscosity, and other techniques.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHEM 242 [Min Grade: D] and (CHEM 252 [Min Grade: D] or CHEM 253 [Min Grade: D])

CHEM 467 Polymer Chemistry III 3.0 Credits
Covers spectroscopy of polymers; rubber elasticity; morphology; viscoelasticity; thermal analysis; computational methods; testing, fabrication, and processing; and magnetic and mechanical properties of polymers.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHEM 252 [Min Grade: D] or CHEM 253 [Min Grade: D] or CHEC 352 [Min Grade: D] or ENGR 210 [Min Grade: D]

CHEM 493 Senior Research Project 0.5-12.0 Credits
Provides individualized research with a faculty member in any number of chemical disciplines. Requires written report. May be repeated three times for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 12 credits
Restrictions: Can enroll if major is CHEM and classification is Junior or Senior.

CHEM 497 Research 0.5-12.0 Credits
Covers research problems in several areas of chemistry. Requires written report.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if major is CHEM.

CHEM I199 Independent Study in CHEM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CHEM I299 Independent Study in CHEM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CHEM I399 Independent Study in CHEM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CHEM I499 Independent Study in CHEM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CHEM T180 Special Topics in Chemistry 0.0-5.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 15 credits

CHEM T280 Special Topics in Chemistry 0.0-5.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 15 credits

CHEM T380 Special Topics in Chemistry 0.0-5.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 15 credits

CHEM T480 Special Topics in Chemistry 0.0-5.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 15 credits

Chinese

Courses

CHIN 101 Chinese I 4.0 Credits
Introductory Mandarin Chinese. Includes listening, speaking, and reading, with individual audiolingual practice. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CHIN 102 Chinese II 4.0 Credits
Continues CHIN 101. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHIN 101 [Min Grade: C]

CHIN 103 Chinese III 4.0 Credits
Continues CHIN 102. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHIN 102 [Min Grade: C]

CHIN 104 Chinese Speaking, Level II (Pinyin Only Track Option) 4.0 Credits
Chinese Speaking, Level II (Pinyin Only Track Option) includes listening, speaking, reading, and some writing solely using the Chinese phonetic system: pinyin. This course will continue to introduce standard (Mandarin) Chinese to students who have had little or no previous knowledge of the language. The course is designed to help students to continue acquiring the rudimentary knowledge of Chinese and develop basic skills in listening and speaking in the language. In this class, more emphasis will be given to the training of standard pronunciation and listening comprehension as well as some basic grammar and vocabulary usage. Students will be expected to work solely in recognizing and writing pinyin, placing a much heavier emphasis on learning Chinese as a spoken language.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHIN 101 [Min Grade: C]

CHIN 105 Chinese Speaking, Level III (Pinyin Only Track Option) 4.0 Credits
Chinese Speaking, Level III (Pinyin Only Track Option) includes listening, speaking, reading, and some writing solely using the Chinese phonetic system: pinyin. This course will continue to introduce standard (Mandarin) Chinese to students who have had little or no previous knowledge of the language. The course is designed to help students to continue acquiring the rudimentary knowledge of Chinese and develop basic skills in listening and speaking in the language. Students will be expected to work solely in recognizing and writing pinyin, placing a much heavier emphasis on learning Chinese as a spoken language. This course is specifically designed for spoken language acquisition. Students who take Chinese Speaking, Level III will not be able to continue on to Chinese 201.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHIN 104 [Min Grade: C]

CHIN 201 Chinese IV 4.0 Credits
This course includes listening, speaking, reading, and writing practice, with a focus on cultural competency and conversational skills. Builds on CHIN 103.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHIN 103 [Min Grade: C]

CHIN 202 Chinese V 4.0 Credits
This course includes listening, speaking, reading, and writing practice, with a focus on cultural competency and conversational skills. Builds on CHIN 201.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHIN 201 [Min Grade: C]

CHIN 310 Advanced Writing and Speaking 4.0 Credits
Provides advanced practice in written and oral communication, including journalistic, professional, and creative writing. Examines contemporary cultural contexts through media and news. Taught in Chinese.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHIN 202 [Min Grade: C]

CHIN 320 Introduction to Language for the Professions 3.0 Credits
Introduction to communication skills in areas such as contemporary business, health, and law in a culturally sensitive fashion. Taught in Chinese.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: CHIN 310 [Min Grade: C]

CHIN 340 Introduction to Power and Resistance 3.0 Credits
Introduction to the analysis of power relations and issues of (in)equality rooted in contemporary political and socio-economic systems. Taught in Chinese.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: CHIN 310 [Min Grade: C]

CHIN 350 Introduction to Language, Media, and Society 3.0 Credits
Introduction to the role of language and media in society, including sociolinguistics, gender, media studies, and communication. Taught in Chinese.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: CHIN 310 [Min Grade: C]

CHIN 420 Advanced Topics in Language for the Professions 3.0 Credits
Advanced communication skills in areas such as contemporary business, health, and law in a culturally sensitive fashion. Taught in Chinese. Topics will vary according to the instructor's expertise.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: CHIN 310 [Min Grade: C]

CHIN 440 Advanced Topics in Power and Resistance 3.0 Credits
Advanced analysis of power relations and issues of (in)equality rooted in contemporary political and socio-economic systems. Taught in Chinese. Topics will vary according to the instructor's expertise.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: CHIN 310 [Min Grade: C]

CHIN 450 Advanced Topics in Language, Media, and Society 3.0 Credits
Advanced analysis of the role of language and media in society, including sociolinguistics, gender, media studies, and communication. Taught in Chinese. Topics will vary according to the instructor's expertise.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: CHIN 310 [Min Grade: C]

CHIN 480 Chinese Minor Thesis Course 0.5-4.0 Credits
Independent research study on a topic selected by the student. Independent study is supervised by a faculty member and guided by a plan of study. At the end of the course, the student is required to produce a paper and oral defense on the topic of his paper.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CHIN I199 Independent Study in CHIN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CHIN I299 Independent Study in CHIN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CHIN I399 Independent Study in CHIN 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CHIN I499 Independent Study in CHIN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CHIN T180 Special Topics in Chinese 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CHIN T280 Special Topics in Chinese 0.0-12.0 Credits
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CHIN T380 Special Topics in Chinese 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CHIN T480 Special Topics in Chinese 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Civic Engagement

Courses

CIVC 100 Foundations of Civic Engagement 3.0 Credits
This course is designed to help students develop skills as active participants in a pluralistic democratic society through direct service, education, and reflection opportunities. It will cover key concepts and frameworks for understanding civic engagement, including: models of civic life through American history; critiques of philanthropy, volunteerism, community service, public service, and political activism; and university-community relations.
College/Department: Center for Civic Engagement
Repeat Status: Not repeatable for credit

CIVC 101 Introduction to Civic Engagement 1.0 Credit
This course is designed to help students develop skills as active participants in a pluralistic, democratic society through direct service, education and reflection opportunities.
College/Department: Center for Civic Engagement
Repeat Status: Not repeatable for credit

CIVC 200 Active Citizenship and Community-Based Learning 3.0 Credits
By exploreing the conceptions of active citizenship and taking part in civic engagement activities, this course will examine issues regarding community-based learning experiences for today's university students.
College/Department: Center for Civic Engagement
Repeat Status: Not repeatable for credit
Prerequisites: CIVC 100 [Min Grade: D]

CIVC 201 Civic Engagement Leadership 3.0 Credits
This course provides experiential learning in community settings as students observe, define, analyze, and practice leadership skills.
College/Department: Center for Civic Engagement
Repeat Status: Not repeatable for credit
Prerequisites: CIVC 100 [Min Grade: D]

CIVC 202 University-Community Partnerships 3.0 Credits
This course will examine the university as a social institution and community actor.
College/Department: Center for Civic Engagement
Repeat Status: Not repeatable for credit
Prerequisites: CIVC 100 [Min Grade: D]

CIVC 490 Capstone Project in Civic Engagement 3.0 Credits
Under faculty supervision, students plan and execute a term project that integrates the academic and community-based knowledge acquired in their curriculum. Students define an issue and set learning objectives relevant to the project, develop a plan for implementation, and complete the term project.
College/Department: Center for Civic Engagement
Repeat Status: Not repeatable for credit

CIVC I199 Independent Study in CIVC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Center for Civic Engagement
Repeat Status: Can be repeated multiple times for credit

CIVC I299 Independent Study in CIVC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Center for Civic Engagement
Repeat Status: Can be repeated multiple times for credit

CIVC I399 Independent Study in CIVC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Center for Civic Engagement
Repeat Status: Can be repeated multiple times for credit

CIVC I499 Independent Study in CIVC 1.0-3.0 Credit
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Center for Civic Engagement
Repeat Status: Not repeatable for credit

CIVC T180 Special Topics in CIVC 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Center for Civic Engagement
Repeat Status: Can be repeated multiple times for credit

CIVC T280 Special Topics in CIVC 3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Center for Civic Engagement
Repeat Status: Can be repeated 2 times for 6 credits

CIVC T380 Special Topics in CIVC 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Center for Civic Engagement
Repeat Status: Can be repeated multiple times for credit

CIVC T480 Special Topics in CIVC 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Center for Civic Engagement
Repeat Status: Can be repeated multiple times for credit

Civil & Arch Engineering

Courses

CAE 491 [WI] Senior Design Project I 3.0 Credits
Introduces the design process, including information retrieval, problem definition, proposal writing, patents, and design notebooks. Includes presentations on problem areas by experts from industry, government, and education. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: (CIVE 330 [Min Grade: D] and CIVE 303 [Min Grade: D]) or (AE 391 [Min Grade: D] and CIVE 303 [Min Grade: D]) or (CIVE 330 [Min Grade: D] and CIVE 312 [Min Grade: D]) or (CIVE 303 [Min Grade: D] and CIVE 312 [Min Grade: D])

CAE 492 [WI] Senior Design Project II 3.0 Credits
Continues CAE 491. Requires written and oral progress reports. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CAE 491 [Min Grade: D]

CAE 493 [WI] Senior Design Project III 3.0 Credits
Continues CAE 492. Requires written and oral final reports, including oral presentations by each design team at a formal Design Conference open to the public and conducted in the style of a professional conference. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CAE 492 [Min Grade: D]

Civil Engineering

Courses

CIVE 240 [WI] Engineering Economic Analysis 3.0 Credits
Techniques for project decisions: benefit cost and present worth analysis, rate of return, capital budgeting, risk analysis, environmental impact, and depreciation. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

CIVE 250 Construction Materials 4.0 Credits
Construction Materials.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MEM 202 [Min Grade: D] and CAEE 202 [Min Grade: D] and ENGR 220 [Min Grade: D]

CIVE 261 Materials and Structural Behavior I 3.0 Credits
Introduces the basic materials of construction (timber, masonry, steel, and concrete). Covers their behavior as ingredients of the structural system. Required for architecture and construction management students. Fall.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is AE or major is CIVE or classification is Freshman
Prerequisites: PHYS 182 [Min Grade: D]

CIVE 262 Materials and Structural Behavior II 3.0 Credits
Continues CIVE 261. Required for architecture and construction management students. Winter.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is AE or major is CIVE or classification is Freshman
Prerequisites: CIVE 261 [Min Grade: D]

CIVE 263 Materials and Structural Behavior III 3.0 Credits
Continues CIVE 262. Required for architecture and construction management students. Spring.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is AE or major is CIVE or classification is Freshman
Prerequisites: CIVE 262 [Min Grade: D]

CIVE 302 Structural Analysis I 4.0 Credits
Covers analysis of statically determinate structures: equilibrium, compatibility, boundary conditions, complimentary and virtual work, energy theorems, reactions, member forces and deflection of trusses, beams and frames, and influence lines. The laboratory portion will make use of structural analysis computer programs to construct analytical models of various structural systems. Calculate reactions and deflections of statically determinate and indeterminate structures and check reliability of results.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CIVE 250 [Min Grade: D] and MEM 230 [Min Grade: D]

CIVE 303 Structural Design I 3.0 Credits
This course will provide a general overview of engineering design (20%) and then a specific treatment of the structural design process (80%). The key topics to be covered include the determination of system-level loads/demands, the estimation of element-level demands and demand envelops, and the sizing of beams and columns constructed of both reinforced concrete and structural steel.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CIVE 302 [Min Grade: D]

CIVE 312 Soil Mechanics I 4.0 Credits
Overview of geotechnical engineering; principles and practices. Exploration methods and soil profile preparation. Index properties used in engineering and agricultural classification systems. Description and modification of three phase particulate and void descriptions and modification. Laninar liquids flow as per d/Arcy's law.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CAEE 212 [Min Grade: D] and CIVE 320 [Min Grade: D]

CIVE 315 Soil Mechanics II 4.0 Credits
This course covers stress-strain and stability behavior of porous particulate soil. Effective stress and laminar flow are combined in one-dimensional consolidation. Stress distribution from applied loads and the resulting deformation are addressed in elastic and plastic equilibrium stages. Failure theory and measurement of strength properties are included, along with basic application to slopes, retaining structures, and both shallow and deep foundations.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MEM 230 [Min Grade: D] and CIVE 250 [Min Grade: D] and CIVE 312 [Min Grade: D]

CIVE 320 Introduction to Fluid Flow 3.0 Credits
Covers fundamentals of fluid flow, fluid properties, hydrostatic forces, kinematics of flow, the Bernoulli equation, linear momentum, dimensional analysis, Froude and Reynolds similarity and hydraulic models and an introduction to pipe flows and friction.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: TDEC 202 [Min Grade: D] or ENGR 210 [Min Grade: D]

CIVE 330 Hydraulics 4.0 Credits
Covers pipe flow, friction losses, multiple pipe systems, water demand and distribution network design, pumps and pumping systems, air flow in ducts and fans, open channel flows, hydraulic jumps and energy dissipation, gravity pipe networks and the design of storm and sanitary sewer systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CIVE 320 [Min Grade: D]

CIVE 375 Structural Material Behavior 3.0 Credits
Study of deformation, fracture and fatigue of structural materials used in infrastructure. Includes basic failure modes, yielding and plasticity, and fracture mechanics. Emphasis on analytical and predictive methods that designers use to avoid failure. Metals, ceramic and composites are considered, as is time-dependent behavior.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 230 [Min Grade: D] and CIVE 250 [Min Grade: D] and (MATH 201 [Min Grade: D] or MATH 261 [Min Grade: D] or ENGR 231 [Min Grade: D])

CIVE 400 First Principles of Structural Design 3.0 Credits
Covers analysis of statically indeterminate structures: force methods for trusses, beams and frames, slope-deflection and equilibrium methods, moment distribution, stiffness matrices of truss and beam elements, and stiffness matrix method of analysis.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: CIVE 303 [Min Grade: C]

CIVE 401 Structural Design II 3.0 Credits
Covers principles of design of reinforced concrete structural systems, including beams, slabs, columns, and footings.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CIVE 400 [Min Grade: D]

CIVE 402 Structural Design III 3.0 Credits
Covers elastic and plastic design of structural steel members, including beams, columns, tension members, beam columns, and plate girders; design of welded and high-strength bolted connections; and design of steel trusses, bridges, and buildings.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CIVE 401 [Min Grade: D]

CIVE 430 Hydrology 3.0 Credits
Covers the relationship between precipitation and runoff, unit hydrographs, flood routing, and water supply principles and applications.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CAEE 212 [Min Grade: D] and CIVE 320 [Min Grade: D]

CIVE 431 Hydrology-Ground Water 3.0 Credits
Covers geologic and hydrologic occurrence of groundwater, underground flow, and groundwater supply. Winter.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CIVE 330 [Min Grade: D]

CIVE 477 [WI] Seminar 2.0 Credits
Covers professional development and ethics. Requires preparation of a technical paper. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

CIVE 478 [WI] Seminar 1.0 Credit
Requires preparation and presentation of a technical paper. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

CIVE I199 Independent Study in CIVE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CIVE I299 Independent Study in CIVE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CIVE I399 Independent Study in CIVE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CIVE I499 Independent Study in CIVE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CIVE T180 Special Topics in CIVE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CIVE T280 Special Topics in CIVE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CIVE T380 Special Topics in CIVE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

CIVE T480 Special Topics in CIVE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

Civil, Arch & Envr Engr

Courses

CAEE 202 Introduction to Civil, Architectural & Environmental Engineering 3.0 Credits
This course introduces the planning, design, construction, operation, maintenance and documentation of engineering projects that are in unique social, topographic, environmental and geologic settings. The scope and principles of Civil, Architectural and Environmental engineering practice are each presented as well as the relationships between the three disciplines. The concepts are illustrated through laboratory projects, case studies, field trips and field measurement exercises. The course also addresses professional ethics, practice and licensure.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

CAEE 203 System Balances and Design in CAEE 3.0 Credits
Based on fundamental science and mathematics preparation, this course for students in Civil, Architectural and Environmental Engineering covers delineation of system boundaries, analysis of mass, energy and force balances that support system integration; life cycle and uncertainty analysis; and formulation of problem solutions using these balances.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CAEE 202 [Min Grade: D] and (ENGR 231 [Min Grade: D] or MATH 201 [Min Grade: D] or MATH 261 [Min Grade: D])

CAEE 212 Geologic Principles for Infrastructure & Environmental Engineering 4.0 Credits
This course focuses on geological principles and their relationships to engineering properties and behavior of soil and rock materials. Topics include formation of minerals, igneous, sedimentary, and metamorphic rocks, plate tectonics, structural geology, rock mechanics, landforms and geological hazards. Labs focus on mineral and rock identification, map skills, and rock mechanics.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CAEE 202 [Min Grade: D]

CAEE 301 Community-Based Design 3.0 Credits
This course evaluates the weight of evidence for community-based design practices as related to peacebuilding, conflict management and sustainable development. A case-study-based approach will enable students to study participatory theory, informed design and adaptive management.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

CAEE 361 Statistical Analysis of Engineering Systems 3.0 Credits
This class covers probability and statistics with applications to civil, architectural, and environmental engineering. Students will learn probability theory, distributions of random variables, and statistical hypothesis testing.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

CAEE I199 Independent Study in CAEE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consulation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CAEE I299 Independent Study in CAEE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consulation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CAEE I399 Independent Study in CAEE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consulation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CAEE I499 Independent Study in CAEE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consulation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CAEE T180 Special Topics in CAEE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CAEE T280 Special Topics in CAEE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CAEE T380 Special Topics in CAEE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CAEE T480 Special Topics in CAEE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

Common Exams

Courses

EXAM 080 Common Exam Period - I 0.0 Credits
College/Department: University Courses
Repeat Status: Can be repeated multiple times for credit

EXAM 081 Common Exam Period - II 0.0 Credits
College/Department: University Courses
Repeat Status: Can be repeated multiple times for credit

EXAM 082 Common Exam Period - III 0.0 Credits
College/Department: University Courses
Repeat Status: Can be repeated multiple times for credit

Communication

Courses

COM 101 Human Communication 3.0 Credits
This course explores the elements of basic human communication -
what does it mean to communicate? What makes communication good
or bad? What is the nature of verbal and non-verbal messages? What
does it mean to communicate in a group? How does culture affect
communication?.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is COMM.

COM 111 Principles of Communication 3.0 Credits
Explores the importance of communication in organizational settings.
Includes assessment of appropriate modes of communication, including
written, spoken, and electronic.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

COM 150 Mass Media and Society 3.0 Credits
Provides an overview of the history, economic structure, regulation, and
impact of the mass media in the United States.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

COM 160 Introduction to Journalism 3.0 Credits
This course is designed to acquaint students with various forms of
basic newswriting and interview techniques. Students will learn how to
write leads and short articles under deadline pressure. This is a writing-
intensive course. Although writing is the main emphasis of this class,
students also will learn newsroom organization, ethics and press law.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

COM 181 Public Relations Principles and Theory 3.0 Credits
This course focuses on the principles of public relations. It introduces
students to the theory and practice of PR taught in the context of real
life material and situations. The course also covers main public relations
techniques, tools, and types of publics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

COM 200 Current Events in Media and Communication 3.0 Credits
Media are not only the channels through which we learn about current
events—they are also, often, event makers themselves. This course
will explore the collaborative relationships between media and current
events, while exploring the topics of contemporary interest from the last
2-3 months.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

COM 210 Theory and Models of Communication 3.0 Credits
Surveys historical and contemporary attempts to understand the
process of human communication, using examples from the literature of
interpersonal, group, organizational, and mass communication.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

COM 211 Children and Media 3.0 Credits
This course examines the effects of media on the well-being and
development of children and adolescents from a number of perspectives,
including: emotional, intellectual, and physical. Through research,
discussion and writing, students consider the effects of not only the
"legacy" media (television, radio, music and print), but also those of "new"
media, including social media.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

COM 220 Qualitative Research Methods 3.0 Credits
This course provides a detailed investigation of the nature, application,
analysis and write up of qualitative research in communication and the
social sciences, including such topics as ethnography, in-depth interviews,
focus groups, participant observation, and narrative analysis.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

**COM 221 Quantitative Research Methods in Communication 3.0
Credits**
This course introduces students to quantitative methods used in the
study of communication. The course will help student develop techniques
to understand research problems in communication settings. Students
will consider applications, including survey research, content analysis,
usability testing, and experimental design, and will discuss procedures for
developing, operationalizing, and testing questions within communication
environments.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

COM 222 Interpersonal Communication 3.0 Credits
This course is designed to acquaint students with a more thorough
understanding of the dynamics of interpersonal communication. This
will be done through both a review of scholarly writing on the subject,
as well as direct observations and analysis. By the end of this course,
students should have a much deeper appreciation of the complexities of
interpersonal communication, their own capacities as a communicator, as
well as increased interpersonal communication skills.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: COM 101 [Min Grade: D] or COM 111 [Min Grade: D]

COM 230 Techniques of Speaking 3.0 Credits
A workshop course in improving public speaking skills. Provides
experience in speeches of explanation, persuasion, and argument.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: HUM 102 [Min Grade: D] or HUM 105 [Min Grade: D] or
HUM 107 [Min Grade: D] or ENGL 102 [Min Grade: D] or ENGL 105 [Min
Grade: D]

COM 240 New Technologies In Communication 3.0 Credits
Provides an overview and survey of the changes taking place in the
technologies of information production, distribution, storage, and display,
including the interaction of these changes with legal, social, cultural, and
communications systems.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

COM 246 Media and Identity 3.0 Credits
This course focuses on the central role that identity plays in popular
culture, exploring how media reflect diverse identities and how, in turn, we
use media to construct our own identities.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

COM 247 Social Media in Communication 3.0 Credits
Social Media provide a communication system for connecting,
collaborating and building community. We will examine how these
functions may be applied in personal, professional and political contexts.
Activities will include readings, case studies and discussions. Students will
create a strategic plan for using social media for personal, organizational
or political purposes.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

COM 261 Advanced Journalism 3.0 Credits
This course is designed for students interested in advancing their
knowledge of news reporting and writing. Students will learn how to cover
meetings, speeches, public affairs, such as courts, and to write for digital
media. In addition, students will learn how to write human-interest stories,
called features.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: COM 160 [Min Grade: D]

COM 265 Audio Journalism 3.0 Credits
This course will familiarize students with the creation of audio news and
editorial content that is used not only in traditional radio broadcasting,
but also in web-delivered programming such as podcasts and streamed
audio. Students will learn the unique characteristics of audio journalism,
practice "writing for the ear" and will record and edit digital audio.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: COM 160 [Min Grade: D] or COM 260 [Min Grade: D]

COM 266 Copy Editing for the Media 3.0 Credits
This course is designed to acquaint students with the necessary skills
to prepare written materials for the media. It will cover traditional print
media, magazines and online media, such as websites and blogs. The
importance of accuracy, consistency, and credibility in handling written
copy will be emphasized. Skills to write captivating headlines, captions
and other accompaniments to visuals will be a large focus of this class.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: COM 160 [Min Grade: D] or COM 260 [Min Grade: D]

COM 270 [WI] Business Communication 3.0 Credits
Covers the writing of business letters, resumes, memos, proposals, and
reports. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: HUM 103 [Min Grade: D] or HUM 105 [Min Grade: A] or
HUM 108 [Min Grade: D] or ENGL 103 [Min Grade: D] or ENGL 105 [Min
Grade: A]

COM 282 [WI] Public Relations Writing 3.0 Credits
In this writing-intensive course, students will develop the professional-
level writing skills expected of public relations practitioners. The objectives
include building an understanding of PR writing styles and genres as
a persuasive influence and learning how to use basic information in
different PR media kits, memos, letter, and other external and internal
communications.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: COM 181 [Min Grade: D] or COM 280 [Min Grade: D]

**COM 284 Public Relations Research, Measurement and Evaluation
3.0 Credits**
Public Relations research is the first essential element in the process of
Public Relations. The purpose of this course is to introduce students to
the methods of quantitative and qualitative research most widely used to
assess an organization's public relations efforts.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: COM 181 [Min Grade: D] or COM 280 [Min Grade: D]

COM 286 Public Relations Strategies and Tactics 3.0 Credits
This course helps students better understand the advanced concepts, strategies, and tactics practiced in public relations today. It combines real-life case studies with core theoretical ideas to help students relate theory to the actual practice of the profession. This intermediate-level course connects scholarship with time-honored real-life PR strategies and tactics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: COM 282 [Min Grade: D]

COM 290 Sports and the Mass Media 3.0 Credits
To explore the interrelationships between professional and college sports and the mass media. Students will look at how news media coverage has changes sports, the conventions found in sports journalism, promotion and marketing of sports teams and leagues, and how sponsorship of sporting events changes the nature of these events.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 102 [Min Grade: D] or ENGL 112 [Min Grade: D]

COM 305 Sports Journalism 3.0 Credits
To gain a deeper appreciation for and understanding of the meaning-making power of sports journalism. We will explore the history of sports journalism, review and critique examples of historically significant sports writing and write game stories and columns based on actual coverage of local and on-campus sporting events.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: COM 260 [Min Grade: D] or COM 160 [Min Grade: D]

COM 310 [WI] Technical Communication 3.0 Credits
Develops skills in communicating technical information. Focuses on writing letters, resumes, proposals, reports, and instructions. Offers extensive writing practice along with exercises and presentations. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: HUM 103 [Min Grade: D] or HUM 105 [Min Grade: A] or HUM 108 [Min Grade: D] or ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: A]

COM 315 Investigative Journalism 3.0 Credits
Mastery of investigative reporting tactics and strategies enables student to explore and write about issues of great importance to the community.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: COM 260 [Min Grade: D] or COM 261 [Min Grade: D]

COM 316 Campaigns for Health & Environment 3.0 Credits
This seminar-style course explores theories and practical aspects of environmental and health campaigns and community-based social marketing campaigns. This course has a strong applied component.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

COM 317 [WI] Environmental Communication 3.0 Credits
This reading and writing intensive course will explore communication about environmental issues. Topics can include advocacy campaigns, social marketing, environmental journalism, media coverage of environmental issues, green marketing, the environment in popular culture, risk communication, and public participation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

COM 318 Film, Celebrity and the Environmental Movement 3.0 Credits
Using the framework of mass media and behavioral change theories, we will look at the environmental movement through the lends of "eco celebrities" and mainstream environmental films and will discuss how Hollywood shapes our perceptions of the environment and whether this has helped or hurt the environmental movement.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

COM 320 [WI] Science Writing 3.0 Credits
A workshop course in writing on scientific subjects. Includes analysis of the current market for science writing; examination of exemplary pieces of science writing; instruction in finding article ideas, interviewing, and working with editors; and production of feature-length articles. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: HUM 103 [Min Grade: D] or HUM 105 [Min Grade: A] or HUM 108 [Min Grade: D] or ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: A]

COM 325 The Cultural Significance of Fame 3.0 Credits
We will explore why fame is so important to us. Why do so many of us want it so badly? Why do we envy those who have it? What does the pursuit of fame say about us and about society? You will explore your own perception of fame, dissect your fame-related experiences, and analyze how the mass media keep us thinking and talking about fame.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: COM 150 [Min Grade: D]

COM 326 Public Relations for Science 3.0 Credits
Public relations in the service of science poses special challenges. Perhaps the biggest challenge arises from the tension between science's search for truth and public relations' work for advocacy. This course explores this tension and ways of resolving it through a combination of readings in recent practice and scholarship in the field, analyses of recent case studies, and conversations with area professionals in public relations for science.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

COM 330 Professional Presentations 3.0 Credits
A workshop course in the theory and practice of making effective
professional presentations for the technical and business professional.
Provides a systems approach to the planning, production, and
presentation of visual/aural programs.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: COM 230 [Min Grade: D]

COM 335 Digital Publishing 3.0 Credits
Digital Publishing gives students applied and theoretical knowledge of
professional digital publishing. Students will learn and apply best practices
relating to writing and integrating text and graphics to create audience-
specific branded websites and/or blogs. Students will also apply credibility
and usability standards to evaluate websites.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 102 [Min Grade: D] or ENGL 112 [Min Grade: D]

COM 340 Desktop Publishing 3.0 Credits
Covers production of publications using desktop publishing software,
including planning, writing, designing, and budgeting of institutional
magazines, newsletters, manuals, and brochures. Requires students to
design several pieces (letterheads and flyers).
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 102 [Min Grade: D] or ENGL 112 [Min Grade: D]

COM 342 English Worldwide 3.0 Credits
This course provides an overview of the spread of English globally, by
examining English as a language of trade, diplomacy, and education, as
well as its status as an aesthetic and market force. For a final project,
students research how English is utilized for social, economic, and
political purposes in a single area of the world.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 102 [Min Grade: D] or ENGL 112 [Min Grade: D]

COM 345 Intercultural Communication 3.0 Credits
This course introduces students to the theory and practice of
intercultural communication. Drawing from traditions in anthropology and
communication, intercultural communication is the study of the effect
of differing cultural norms and beliefs upon communication between
speakers. Through a wide range of readings, journal writing assignments,
and participative and experiential activities, students will develop both
their understanding of and skills in inter-cultural communication. A final
project and presentation draws together participative experiences and the
readings and class discussions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

COM 350 [WI] Document Design and Evaluation 3.0 Credits
Introduces the principles and practice of designing documents and
measuring their effectiveness with audiences. This is a writing intensive
course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

COM 351 Computer Mediated Communication 3.0 Credits
We focus on practices and affordances of Computer Mediated
Communication (CMC). We consider how computer technology is used
in social interaction and its practical consequences. We focus on social
practices and uses of technology. We use qualitative methods of analysis
to understand the practices of CMC.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: COM 220 [Min Grade: D]

COM 355 Ethnography of Communication 3.0 Credits
Examines theories and methods of qualitative language and
communication studies. Topics include story telling, greetings, gossip,
self-presentation in talk, language of ritual and religion, men and women's
roles in communication, and communicative events and competence.
Case student in literature will be analyzed and will form a basis for the
students' own ethnographic fieldwork.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: HUM 103 [Min Grade: D] or HUM 105 [Min Grade: A] or
HUM 108 [Min Grade: D] or ENGL 103 [Min Grade: D] or ENGL 105 [Min
Grade: A]

COM 360 International Communication 3.0 Credits
Examines the political, cultural, technological, and economic processes
and effects of international communication flow.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

COM 362 International Negotiations 3.0 Credits
This course is designed to give students a comprehensive overview of
the field including different theoretical points of view on the process of
international negotiations; the role of perceptions in this process; the role
of internal politics and cultural variables in the process of international
negotiations.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.

COM 363 Event Planning 3.0 Credits
This course will provide the student with the theoretical and practical
fundamentals in understanding the complexities of producing Special
Events across all major industries. Special Events addresses all elements
of the communication process.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

COM 365 Journalists, the Courts, and the Law 3.0 Credits
Students explore and apply techniques for covering the court system, and explore case law and recent key legal developments that have reshaped how journalists do their jobs.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: COM 260 [Min Grade: D] or COM 160 [Min Grade: D]

COM 375 [WI] Grant Writing 3.0 Credits
Students explore the grant writing process, from the development of an idea and researching appropriate contributors, to writing a fully realized grant proposal, complete with budget. Course topics also include surveying the political and social climate before developing an idea, assessing an organization's capabilities to handle a project, and performing through literature reviews. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: COM 270 [Min Grade: D] or COM 310 [Min Grade: D] or SOC 260 [Min Grade: D] or SOC 355 [Min Grade: D]

COM 376 Nonprofit Communication 3.0 Credits
All nonprofit organizations must develop and maintain effective communication strategies in order to survive in a competitive economy. Nonprofits have unique needs and limitations in their longterm goals and short-term operations that relate to communication. This course introduces students to the ways nonprofits communicate with both their constituents and their benefactors and the ways researchers have examined these practices. Students will explore these two perspectives on nonprofit communication through a combination of scholarly readings, dialogues with local representatives in the nonprofit sector, and direct contact and work for a local nonprofit organization (as coordinated by the Drexel Center for the Support of Nonprofit Communication).
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

COM 377 Communication for Civic Engagement 3.0 Credits
Extremist rhetoric and divisive politics seem to go hand-in-hand in today's public deliberations. The media so often pair the word rhetoric itself with the pejorative adjectives mere, empty, and deceptive, that anything rhetorical becomes vilified. This course draws from the ancient accounts of rhetoric and the contemporary studies on rhetoric to rehabilitate it as a way to inform our efforts towards a more civil public discourse. This course also will host guest speakers from local civic and political organizations who engage in rhetorical practices in the service of civic engagement, which includes the discourse both of people who exercise political power and of citizens who debate over public policies and cultural identity.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

COM 378 Public Service Campaigns 3.0 Credits
Public communication campaigns are a familiar and essential part of American civic culture. Campaign topics range from personal issues, such as health, to social issues, such as equal opportunity, energy conservation, and environmental protection. Campaigns are regarded as public service programs if their goals are widely supported by the public and policymakers. If their goals are controversial, however, then they are regarded as advocacy strategies.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

COM 379 Focus Groups 3.0 Credits
This advanced qualitative research methods course will discuss the use of focus groups to collect data for social science inquiry from both an academic and a consumer research perspective. We will take an in-depth look at how to plan, implement, and analyze data collected through a focus group process, including: purposes and uses of focus group interviews, human subjects research considerations, participant recruitment, sampling, question design, facilitation techniques, recording options, transcription, analysis, and reporting of data.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

COM 384 Free Speech & Censorship 3.0 Credits
In this course, students will explore the various forms --some obvious, some not-- that censorship takes. Also explored will be what those who hold dissenting views endure as they try to contribute to the national dialogue. Historical and legal perspective on censorship will also be considered.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

COM 385 Media Effects 3.0 Credits
Some people believe that the mass media rule our lives, making us fat, violent, sexist, etc. Some think that media are irrelevant. Of course these arguments are extreme and simplifications. In this course, we ask: What are the facts regarding media effects research?.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

COM 386 Public Relations Campaign Planning 3.0 Credits
This capstone course will focus on the advanced aspects of public relations: how to analyze, plan, conduct, and implement successful public relations campaigns systematically and scientifically. Students will create full-scale PR campaigns, including budget, media materials, and social media tools, for their real-world "clients," and implement key activities.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: COM 284 and COM 286

COM 390 [WI] Global Journalism 3.0 Credits
Explores the issues facing journalists covering foreign affairs. Students will research and write news stories on issues of global import and will examine the work of foreign correspondents from historical and critical perspectives. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: COM 260 [Min Grade: D] or COM 261 [Min Grade: D]

COM 391 Critiques of Journalism and News Media 3.0 Credits
This course examines the role of journalism and news media in the social construction of our world. Focusing on key topics like framing and agenda setting in media research, we will critically consider how stories are routinely emphasized, excluded, organized, made sense of, and accumulate, plus more. We will discuss such topics in regard to various media (from newspapers to new media), various methods (qualitative and quantitative), and various public issues (including politics, music, sports, and representation of race/gender/sexuality/etc.).
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: COM 150 [Min Grade: D]

COM 400 Seminar in Communication 3.0 Credits
This is an upper-level seminar in various topics in Communication, including but not limited to Rhetoric. Students will undertake an in-depth examination of critical texts or themes in Communication. The course is intended for upper-level majors in Communication and can be repeated for credit with a different topic.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 4 times for 12 credits
Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore
Prerequisites: COM 210 [Min Grade: D]

COM 410 [WI] Advanced Technical Writing 3.0 Credits
Continues COM 310. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: COM 310 [Min Grade: D]

COM 420 Technical, Science and Health Editing 3.0 Credits
Introduces the theory and practice of technical editing, including project and copy editing.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: COM 270 [Min Grade: D] or COM 310 [Min Grade: D] or COM 375 [Min Grade: D] or COM 410 [Min Grade: D]

COM 491 Senior Project in Communication I 3.0 Credits
Covers planning and execution of a professional project that integrates the academic and practical knowledge the student has acquired in his or her major.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is COMM and classification is Senior.
Prerequisites: COM 210 [Min Grade: D] and (COM 220 [Min Grade: D] or SOC 250 [Min Grade: D])

COM 492 Senior Project in Communication II 3.0 Credits
Requires completion and evaluation of the project begun in COM 491.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is COMM and classification is Senior.
Prerequisites: COM 491 [Min Grade: D]

COM I199 Independent Study in COM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

COM I299 Independent Study in COM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

COM I399 Independent Study in COM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

COM I499 Independent Study in COM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

COM T180 Special Topics in Communication Theory 3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

COM T280 Special Topics in Communication Theory 3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

COM T380 Special Topics in Communication Theory 1.0-5.0 Credit
Provides advanced communication studies covering various subjects in interpersonal, group, organizational, and mass communication. May be taken for credit twice.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

COM T480 Special Topics in Communication Theory 3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

Complementary and Integrative Therapies

Courses

CIT 338 Introduction to Complementary & Integrative Health 3.0 Credits
This course provides an introduction to the underpinning philosophy, and practice of complementary and integrative health (CIH). It presents an evidence-based review of the major categories including: phytomedicine, clinical aromatherapy, mind-body interventions, and the role of spirituality in health and healing. In addition, students explore effective relaxation techniques that help to integrate the mind-body-spirit connection, which support health and well-being.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

CIT 345 Holistic Self-Care 3.0 Credits
Holistic Self-Care provides students with an A-Z approach to "living" a holistic, balanced life, complete with step-by-step guidelines necessary to incorporate dietary and lifestyle changes and effective stress reduction and stress management techniques to assist in navigating through the common challenges associated with student life and beyond. Students will be required to purchase a "Holistic Student Stress Reduction Kit", complete with specific essential oils, Meditation DVD, and guided stress reduction techniques.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

CIT 480 Special Topics in Complementary and Integrative Therapies 3.0 Credits
This course consists of content that faculty or students have requested to meet undergraduate special needs or interests. Content is variable and is offered on a one-time, infrequent, or trial basis. Actual course description will be determined by the course director. May be repeated for credit if the topics vary.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 2 times for 9 credits

Computer Science

Courses

CS 140 Introduction to Multimedia Programming 3.0 Credits
Introduction to structured computer programming in a language designed for working with media (images, sound, video), e.g. Python/Jython. Topics include: variables, input and output, expressions, assignment statements, conditionals and branching, files, repetition, functions and parameter passing, one-dimensional and two-dimensional arrays, and media manipulation. Stresses good programming style, documentation, debugging, and testing.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

CS 143 Computer Programming Fundamentals 3.0 Credits
Introduction to structured computer programming in language of instruction (e.g. C++). Topics include: variables, input and output, expressions, assignment statements, conditionals and branching, files, repetition, functions and parameter passing, arrays, and string manipulation. Stresses good programming style, documentation, debugging and testing.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

CS 150 Computer Science Principles 3.0 Credits
An introduction to computer science principles: the big ideas and computational thinking practices central to computer science, and the societal impact of computing and information technology. Exposure to algorithms, big data, machine learning, privacy, security and digital citizenship while introducing and reinforcing the importance of programming.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

CS 161 Introduction to Computing 3.0 Credits
Introduction to the computer as a tool for productivity and communications. Provides fluency in the use of industry-standard software for professional communications and presentations, data analysis, and telecommunication. Introduce automation and programming to enhance the effective use of computers and computer applications.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Corequisite: EXAM 080

CS 164 Introduction to Computer Science 3.0 Credits
An introduction to the field of computer science. Exposure to core areas (selected from algorithms, artificial intelligence, computer architecture, databases, graphics, human-computer interaction, programming languages, scientific computation, software engineering) while introducing and reinforcing the importance of programming.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Corequisite: EXAM 080

CS 171 Computer Programming I 3.0 Credits
Introduces fundamental concepts of computing including memory, instructions, function calls, and activation records. Covers fundamentals of structured computer programming in the language of instruction: variables, input and output, expressions, assignment statements, conditionals and branching, subprograms, parameter passing, repetition, arrays, top-down design, testing, and debugging.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Corequisite: EXAM 080

CS 172 Computer Programming II 3.0 Credits
Covers object-oriented design, inheritance hierarchies, information hiding principles, string processing, recursion, good programming style, documentation, debugging, and testing.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 171 [Min Grade: C] or CS 132 [Min Grade: C] or CS 175 [Min Grade: C]
Corequisite: EXAM 080

CS 175 Advanced Computer Programming I 3.0 Credits
Advanced programming in language of instruction at an accelerated pace: introduces fundamental concepts of computing including memory, instructions, function calls, and activation records. Covers fundamentals of structured computer programming in the language of instruction: conditionals and branching, subprograms, parameter passing, repetition, arrays, top-down design, testing, and debugging. Supplements basic topics with deeper presentation of advanced techniques for those with some incoming programming experience.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

CS 176 Advanced Computer Programming II 3.0 Credits
Enhanced presentation of object-oriented design, inheritance hierarchies, information hiding principles, string processing, recursion, good programming style, documentation, debugging and testing. Includes special focus on language facilities and use of libraries.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 171 [Min Grade: C] or CS 175 [Min Grade: C]

CS 190 Selected Computer Language 3.0 Credits
Focuses on programming in a selected language of interest. Course content, language, and prerequisites may vary according to instructor, with emphasis on applications for which the language is designed. May be repeated for credit.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

CS 260 Data Structures 3.0 Credits
Covers stacks, queues, linked allocation, binary trees, internal searching and sorting, hashing, and applications.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 265 [Min Grade: C]

CS 265 Advanced Programming Tools and Techniques 3.0 Credits
Introduction to the basic principles of programming practice: testing, debugging, portability, performance, design alternatives, and style. Application in a variety of programming languages, programming environments, and operating systems. Introduction to tools used in the software development process for improving program functionality, performance, and robustness.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 172 [Min Grade: C] or CS 176 [Min Grade: C] or CS 133 [Min Grade: C] or SE 103 [Min Grade: C] or ECEC 301 [Min Grade: D] or ECEC 201 [Min Grade: D]

CS 270 Mathematical Foundations of Computer Science 3.0 Credits
Introduces formal logic and its connections to Computer Science. Students learn to translate statements about the behavior of computer programs into logical claims and to prove such assertions using both traditional techniques and automated tools. Considers approaches to proving termination, correctness, and safety for programs. Discusses propositional and predicate logic, logical inference, recursion and recursively defined sets, mathematical induction, and structural induction.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 172 [Min Grade: C] or CS 176 [Min Grade: C] or CS 265 [Min Grade: C] or SE 103 [Min Grade: C] or ECEC 301 [Min Grade: D] or ECEC 201 [Min Grade: D]

CS 277 Algorithms and Analysis 3.0 Credits
Introduces foundational concepts in Computer Science theory, including computability, decidability, the Turing Machine, and algorithmic complexity. Applies concepts underlying graph theory and automata to current topics in computing to create contextualized connections between theory and practice.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 260 [Min Grade: C]

CS 281 Systems Architecture 4.0 Credits
Covers internal function and organization of digital computers, including instruction sets, addressing methods, input-output architectures, central processor organization, machine language, and assembly language.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: (CS 270 [Min Grade: D] or ECE 200 [Min Grade: D]) and (CS 172 [Min Grade: D] or CS 176 [Min Grade: D] or SE 103 [Min Grade: D] or ECEC 301 [Min Grade: D] or ECEC 201 [Min Grade: D])

CS 283 Systems Programming 3.0 Credits
This course introduces computer systems, including interaction of hardware and software through the operating system, from the programmer's perspective. Three fundamental abstractions are emphasized: processes, virtual memory, and files. These abstractions provide programmers a common interface to a wide variety of hardware devices. Topics covered include linking, system level I/O, concurrent programming, and network programming.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 265 [Min Grade: D]

CS 300 Applied Symbolic Computation 3.0 Credits
This course covers the fundamentals of symbolic mathematical methods as embodied in symbolic mathematics software systems, including: fundamental techniques, simplification of expressions, solution of applications problems, intermediate expressions swell, basic economics of symbolic manipulation, efficient solution methods for large problems, hybrid symbolic/numeric techniques.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 260 [Min Grade: D] and CS 270 [Min Grade: D] and MATH 200 [Min Grade: D] and MATH 201 [Min Grade: D]

CS 303 Algorithmic Number Theory and Cryptography 3.0 Credits
Covers fundamental algorithms for integer arithmetic, greatest common divisor calculation, modular arithmetic, and other number theoretic computations. Algorithms are derived, implemented and analyzed for primality testing and integer factorization. Applications to cryptography are explored including symmetric and public-key cryptosystems. A cryptosystem will be implemented and methods of attack investigated.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 260 [Min Grade: D] and (MATH 221 [Min Grade: D] or MATH 222 [Min Grade: D]) and (MATH 201 [Min Grade: D] or ENGR 231 [Min Grade: D])

CS 314 Computing in the Small 3.0 Credits
Explores the technologies and techniques associated with microcontrollers and Systems on Chips (SOCs) as well as their use in embedded systems. A major focus is on developing software to control input and output devices.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

CS 338 Graphical User Interfaces 3.0 Credits
This course covers the design and implementation of graphical user interfaces. Topics include: event-driven programming, application programmer interfaces, widgets, callback functions, windowing systems and desktops, rapid prototyping languages, multithreaded GUI's. A term project involving implementation of a complex application will be undertaken.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 350 [Min Grade: D] or SE 310 [Min Grade: D] or CS 275 [Min Grade: D]

CS 341 Serious Game Development 3.0 Credits
The goal of this course is to learn more about serious games, that is games used in a non-entertainment context, such as games for health, education, and persuasion, through readings and through the design, development, and implementation of serious games.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

CS 342 Experimental Game Development 3.0 Credits
The goal of this course is to develop new ideas and innovations in games through the design, development, and implementation of games using short development cycles and creative thematic constraints.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 345 [Min Grade: D], GMAP 345 [Min Grade: D] (Can be taken Concurrently)

CS 345 Computer Game Design and Development 3.0 Credits
This course introduces students to the computer game design process. Students also learn how the individual skills of modeling, animation, scripting, interface design and story telling are coordinated to produce interactive media experiences for various markets, devices and purposes.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: (DIGM 260 [Min Grade: D] or GMAP 260 [Min Grade: D]) and (CS 265 [Min Grade: D] or DIGM 141 [Min Grade: D])

CS 352 Processor Architecture & Analysis 3.0 Credits
This course covers performance evaluation and benchmarking, pipelining, superscalar processors, multiprocessors, and interfacing processors and peripherals. The memory hierarchy, including cache and virtual memory, are also explored from a programmer's perspective with high-performance computing techniques in mind.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 281 [Min Grade: D] or ECEC 355 [Min Grade: D]

CS 360 Programming Language Concepts 3.0 Credits
Introduces the design and implementation of modern programming languages: formal theory underlying language implementation; concerns in naming, binding, storage allocation and typing; semantics of expressions and operators, control flow, and subprograms; procedural and data abstraction; functional, logic, and object-oriented languages. Students will construct an interpreter for a nontrivial language.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 260 [Min Grade: D] and CS 265 [Min Grade: D] and CS 270 [Min Grade: D]

CS 361 Concurrent Programming 3.0 Credits
Covers programming of concurrent, cooperating sequential processes. Studies race conditions, critical sections, mutual exclusion, process synchronization, semaphores, monitors, message passing, the rendezvous, deadlock, and starvation.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CS 260 [Min Grade: D] and (CS 281 [Min Grade: D] or ECEC 355 [Min Grade: D])

CS 365 System Administration 3.0 Credits
Fundamentals of system administration featuring hands-on practice with an industry standard operating system. Focus on installation, maintenance and management of several systems for multi-user environments.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 260 [Min Grade: D] and CS 265 [Min Grade: D]

CS 370 Operating Systems 3.0 Credits
Explores the internal algorithms and structures of operating systems: CPU scheduling, memory management, file systems, and device management. Considers the operating system as a collection of cooperating sequential processes (servers) providing an extended or virtual machine that is easier to program than the underlying hardware. Topics include virtual memory, input/output devices, disk request scheduling, deadlocks, file allocation, and security and protection.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CS 283 [Min Grade: D] or ECEC 353 [Min Grade: D]

CS 375 Web and Mobile App Development 3.0 Credits
This course introduces students to web-based and mobile development technologies and practices, including tiered application development, Service-Oriented Architectures and associated exchange protocols, and web-database programming. This course explores development and integration of web services from well-known providers as well as services created by the student, using a mobile platform as a vehicle for interactions with the services.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 265 [Min Grade: C] or (CS 164 [Min Grade: C] and CI 103 [Min Grade: C]) and (CS 172 [Min Grade: C] or CS 176 [Min Grade: C])

CS 377 Software Security 3.0 Credits
This course introduces students to foundational concepts underpinning the broad area of software security. It covers topics such as cryptography, access control, software flaws, malicious software, insecurity in software, and operating systems security.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 283 [Min Grade: D] or ECEC 353 [Min Grade: D]

CS 380 Artificial Intelligence 3.0 Credits
Explores the foundations of artificial intelligence: production systems, heuristic programming, knowledge representation, and search algorithms. Also covers programming in an AI language. Additional topics chosen from game theory, decision support systems, pattern matching and recognition, image understanding, natural language, fuzzy and non-monotonic logic, machine learning, theorem proving, and common sense reasoning.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CS 260 [Min Grade: D] and CS 270 [Min Grade: D]

CS 383 Machine Learning 3.0 Credits
This course covers the fundamentals of modern statistical machine learning. Lectures will cover the theoretical foundation and algorithmic details of representative topics including probabilities and decision theory, regression, classification, graphical models, mixture models, clustering, expectation maximization, hidden Markov models, and weak learning.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 260 [Min Grade: D] and (MATH 201 [Min Grade: D] or ENGR 231 [Min Grade: D]) and (MATH 221 [Min Grade: D] or MATH 222 [Min Grade: D]) and (MATH 311 [Min Grade: D] or MATH 410 [Min Grade: D] or ECE 361 [Min Grade: D])

CS 385 Evolutionary Computing 3.0 Credits
This course covers computational intelligence approaches to problem solving for classification, adaptation, optimization, and automated control. Methods covered will include evolutionary programming/genetic algorithms, genetic programming, neural networks, swarm optimization, and fuzzy logic.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 260 [Min Grade: D] and CS 380 [Min Grade: D]

CS 387 Game AI Development 3.0 Credits
This course focuses on artificial intelligence (AI) techniques for computer games. Students will learn both basic and advanced AI techniques that are used in a variety of game genres including first-person shooters, driving games, strategy games, platformers, etc. The course will emphasize the difference between traditional AI and game AI, the latter having a strong design component, focusing on creating games that are "fun to play." Topics include path-finding, decision-making, strategy and machine learning in games.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 260 [Min Grade: D] and CS 380 [Min Grade: D]

CS 430 Computer Graphics 3.0 Credits
The course presents the fundamental geometric representations and drawing algorithms of computer graphics through lectures and programming assignments. The representations include lines, curves, splines, polygons, meshes, parametric surfaces and solids. The algorithms include line drawing, curve and surface evaluation, polygon filling, clipping, 3D-to-2D projection and hidden surface removal.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 260 [Min Grade: D] and (MATH 201 [Min Grade: D] or MATH 261 [Min Grade: D] or ENGR 231 [Min Grade: D])

CS 431 Advanced Rendering Techniques 3.0 Credits
The creation of realistic images from 3D models is central to the development of computer graphics. The ray tracing algorithm has become one of the most popular and powerful techniques for creating photo-realistic images. This class explores the algorithmic components of ray tracing. Students implement many of these components in their class programming projects.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 430 [Min Grade: D] or CS 432 [Min Grade: D]

CS 432 Interactive Computer Graphics 3.0 Credits
This is a project-oriented class that covers the concepts and programming details of interactive computer graphics. These include graphics primitives, display lists, picking, shading, rendering buffers and transformations. Students will learn an industry-standard graphics system by implementing weekly programming assignments. The course culminates with a student-defined project.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 260 [Min Grade: D] and (MATH 201 [Min Grade: D] or MATH 261 [Min Grade: D] or ENGR 231 [Min Grade: D])

CS 435 Computational Photography 3.0 Credits
Fundamentals of computational photography, an interdisciplinary field at the intersection of computer vision, graphics, and photography. Covered topics include fundamentals of cameras, novel camera designs, image manipulation, single-view modeling, and image-based rendering with an emphasis on learning the computational methods and their underlying mathematical concepts through hands-on assignments.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 260 [Min Grade: D] and (MATH 201 [Min Grade: D] or MATH 261 [Min Grade: D] or ENGR 231 [Min Grade: D])

CS 440 Theory of Computation 3.0 Credits
Finite automata, regular sets, and regular expressions; pushdown automata, context-free languages, and normal forms for grammars; Turing machines and recursively enumerable sets; Chomsky hierarchy; computability theory.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: CS 270 [Min Grade: D] and (MATH 221 [Min Grade: D] or MATH 222 [Min Grade: D])

CS 441 Compiler Workshop I 3.0 Credits
Design and implementation of compiler for specified language. Practical application and in-depth study of parsing, scanning, run-time storage management, type analysis, code generation, and error recovery.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: CS 270 [Min Grade: D] and (CS 283 [Min Grade: D] or ECEC 353 [Min Grade: D]) and CS 360 [Min Grade: D] and CS 440 [Min Grade: D]

CS 442 Compiler Workshop II 3.0 Credits
Continuation of CS 441. Advanced topics in compilation, code generation, and optimization for various programming languages and paradigms.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: CS 441 [Min Grade: D]

CS 445 Topics in Computer Gaming 3.0 Credits
Contemporary topics in the design and implementation of computer games. Topics may include game genres, psychological and sociological aspects of games, software tools and game development engines, character and behavior modeling, physical models and realism, virtual reality, graphics and animation, network-based games, performance analysis and efficiency.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated 3 times for 9 credits
Prerequisites: CS 345 [Min Grade: D] or DIGM 345 [Min Grade: D]

CS 457 Data Structures and Algorithms I 3.0 Credits
This course covers techniques for analyzing algorithms, including: asymptotic analysis, recurrence relations, and probabilistic analysis; data structures such as hash tables and binary trees; algorithm design techniques such as dynamic programming, greedy methods, and divide & conquer, as well as graph algorithms for graph traversal, minimum spanning trees, and shortest paths.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 260 [Min Grade: D] and CS 270 [Min Grade: D] and (MATH 221 [Min Grade: D] or MATH 222 [Min Grade: D])

CS 458 Data Structures and Algorithms II 3.0 Credits
This course covers the amortized analysis of algorithms and data structures; Fibonacci heaps; graph algorithms for maximizing network flow and computing minimum all pairs shortest paths; string matching algorithms; NP-Completeness and approximation algorithms.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 457 [Min Grade: D]

CS 461 Database Systems 3.0 Credits
Covers topics including structure and function of database systems, normal form theory, data models (relational, network, and hierarchical), query processing (ISBL), relational algebra and calculus, and file structures. Includes programming project using DBMS.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CS 260 [Min Grade: D]

CS 465 Privacy and Trust 3.0 Credits
This course will motivate the need for privacy protection and introduce basic privacy properties such as anonymity, unlinkability or unobservability. We will then discuss how these properties can be formalized, modeled and measured. The course will provide a broad overview of the state-of-the-art in privacy technologies, explain the main issues that these technologies address, what the current solutions are able to achieve, and the remaining open problems.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 303 [Min Grade: D]

CS 467 Security and Human Behavior 3.0 Credits
Humans are usually the weakest link in information security. Technical measures are easily thwarted by end-user decisions. How are end user decisions made? This course examines security decisions online from the distinct perspective of economics, psychology, anthropology, evolutionary biology, and criminology. We will address topics such as System I vs. System II, mental models, risk perceptions, safety engineering, groups behaviors in primates.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: ECON 201 [Min Grade: D] (Can be taken Concurrently) (INFO 110 [Min Grade: D] or INFO 310 [Min Grade: D]) and PSY 101 [Min Grade: D]

CS 472 Computer Networks: Theory, Applications and Programming 3.0 Credits
Introduction to computer networking theory, applications and programming, focusing on large heterogeneous networks. Broad topdown introductions to computer networking concepts including distributed applications, socket programming, operation system and router support, router algorithms, and sending bits over congested, noisy and unreliable communication links.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 361 [Min Grade: D] or CS 283 [Min Grade: D] or ECEC 353 [Min Grade: D]

CS 475 Computer and Network Security 3.0 Credits
The key objective of this course is to provide a thorough understanding of technologies and methodologies with which computer networks can be protected. Topics that are covered include: key management and credentials, steganography and watermarking, networking security (VPNs, firewalls, intrusion detection) and system security policies.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 472 [Min Grade: D] or CS 283 [Min Grade: D] or ECEC 353 [Min Grade: D]

CS 476 High Performance Computing 3.0 Credits
This course is an introduction to high performance computing, including concepts and applications. Course contents will include discussions of different types of high performance computer architectures (multi-core/multi-threaded processors, parallel computers, etc), the design, implementation, optimization and analysis of efficient algorithms for uni-processors, multi-threaded processors, parallel computers, and high performance programming.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: (CS 281 [Min Grade: D] and CS 283 [Min Grade: D]) or (ECEC 353 [Min Grade: D] and ECEC 355 [Min Grade: D])

CS 479 Advanced Network Security 3.0 Credits
A study of what it takes to make a network secure, starting with an analysis of the sometimes conflicting goals (e.g. anonymity vs. traceability) through the mechanisms that can be used to achieve these goals. Covers in depth both the design options available and the design decisions made in various deployed systems, including Kerberos, IPsec, SSL, and X.509.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 475 [Min Grade: D]

CS 481 Advanced Artificial Intelligence 3.0 Credits
This course covers topics in representation, reasoning, and decision-making under uncertainty; learning; solving problems with time-varying properties. Assignments applying AI techniques toward building intelligent machines that interact with dynamic, uncertain worlds will be given.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 380 [Min Grade: D] and (MATH 311 [Min Grade: D] or MATH 410 [Min Grade: D] or ECE 361 [Min Grade: D])

CS I199 Independent Study in CS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

CS I299 Independent Study in CS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

CS I399 Independent Study in CS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

CS I499 Independent Study in Computer Science 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

CS T180 Special Topics in Computer Science 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

CS T280 Special Topics in Computer Science 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

CS T380 Special Topics in Computer Science 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

CS T480 Special Topics in Computer Science 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

Computing Technology

Courses

CT 140 Network Administration I 3.0 Credits
Students gain an understanding of terminology, technology, and issues involved in implementing networks. Topic include: understanding the OSI 7 layer model; concepts of servers and clients; network hardware/software functions; basics of TCP/IP protocol, main types of network topologies (bus, ring, star and mesh); and share and access network resources (files, printers, etc.).
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 101 [Min Grade: D]

CT 200 Server I 3.0 Credits
Introduces administration and management of Windows operating system. Topics include operating systems installation, configuration, directory services, data storage subsystems, troubleshooting and problem determination of server. In addition the course will cover redundancy, upgrading, and disaster recovery.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 101 [Min Grade: D]

CT 201 Information Technology Security I 3.0 Credits
Surveys information security topics; familiarizes students with the technologies and policies that support confidentiality, integrity and availability. Industry standards for security architecture, operational security, policy and governance are covered and provides the foundations for further study of information security.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

CT 210 Open Server I 3.0 Credits
Introduces administration of open source operating systems and management of open servers. Topics covered include the boot process and fundamental server concepts related to processing, memory and storage. Addresses use of a command line interface to manage processes, modify file permissions, examine configuration settings, and run utilities for server administration.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

CT 212 Computer Forensics I: Fundamentals 3.0 Credits
This course presents the theory, methodology and hands-on labs necessary for students to become competent in the basics of computer forensics. Topics covered include: understanding computer investigations, the investigators, laboratory, current forensics tools, digital evidence controls and processing crime.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

CT 250 IT Security Awareness 3.0 Credits
This course explores the challenges IT security teams face when trying to mitigate threats targeting the human element within their organizations. IT Security Awareness introduces students to techniques and concepts that threaten security of organizations by targeting their human assets.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

CT 301 Information Technology Security II 3.0 Credits
Focuses on securing digital infrastructure by examining threats, vulnerabilities, and technologies used to prevent cyber attacks such as: encryption, security devices, software, authentication and identity protocols. Hands-on labs demonstrate the use of tools and techniques discussed in the course.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CT 140 and CT 201

CT 310 Open Server II 3.0 Credits
Presents an in depth study of server administration utilizing the Linux Operating System. Topics covered include: shell environments, shell program structures, executions, variables, positional parameters, special shell variables, and shell programming statements. In addition the course will examine shell conditional statements, looping constructs, interrupt handling, and debugging tools.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CT 210 [Min Grade: D]

CT 312 Access Control and Intrusion Detection Technology 3.0 Credits
Fundamental theory and methodology of intrusion detection systems. Using intrusion detection systems to secure corporate and personal networks against attacks. Hands-on laboratory experience using an in-depth, open-source network intrusion detection system.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CT 420 [Min Grade: D] or CT 301 [Min Grade: D]

CT 315 Security Management Practice 3.0 Credits
Managerial issues involved in the daily operations of an IT Security department. Topics include staffing, budgets, job descriptions, long term planning, resource allocation, training of security personnel, motivational techniques, interaction with other departments including upper management.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore

CT 320 Server II 3.0 Credits
Presents an in depth study of Windows server operating system and active directory. Topics include installation, implementation, administration of resources, monitoring, troubleshooting techniques. In addition, the course will examine Windows based network management tools, high availability and disaster recovery.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CT 200 [Min Grade: D]

CT 330 Network Administration II 3.0 Credits
Course covers both theoretical knowledge and hands-on exercises for networking using CISCO hardware. Topics include: Extending Switched Networks with VLANS; Determining IP Traffic with Access Lists; Establishing Point-to-Point Connections; and Establishing Frame Relay Connections.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CT 140 [Min Grade: D]

CT 335 Mobile Applications 3.0 Credits
Provides students with an understanding of mobile technologies and the components for building and testing mobile applications. Topics covered include: mobile frameworks, plugins, mobile device storage, visual design and user interfaces for mobile applications, device sensors, and compression.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CT 230 [Min Grade: D] or INFO 152 [Min Grade: D] or CS 265 [Min Grade: D]

CT 353 Virtual Environments and Cloud Security 3.0 Credits
This course explores various models of virtual servers, storage, networks and levels of cloud computing. Students will learn how to apply best practice solutions to secure virtual environments and the different levels of cloud computing.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CT 200 [Min Grade: D] and CT 210 [Min Grade: D]

CT 355 Wireless Network Security Technology 3.0 Credits
Theory, methodology and hands-on labs relating to the unique security issues of Wireless Networks. Limitations and risks of Wireless Networks. Use of audit and exploit tools to discover security flaws. Protocol and signal vulnerabilities. Methods to secure such vulnerabilities.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CT 420 [Min Grade: D] or CT 301 [Min Grade: D]

CT 362 Network Auditing Tools 3.0 Credits
Theory, methodology and hands-on labs relating to Network Auditing. The course relies on advanced multi-functional network auditing tools to uncover Network Security problems, with the purpose of eliminating these vulnerabilities.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CT 420 [Min Grade: D] or CT 301 [Min Grade: D]

CT 382 Applied Cryptography 3.0 Credits
This course presents the theory, methods, strengths, weaknesses, and effective strategies necessary for students to acquire a fundamental knowledge of Cryptography and Stenography. This is a hands-on course utilizing several tools and software programs. Emphasis is placed on formulating effective strategies, such as when and how to protect computer data.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

CT 388 Topics in Computing Technology I 3.0 Credits
This course will cover special topics of interest to students in the Computing Technology Major. May be repeated for credit.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated 4 times for 12 credits

CT 389 Topics in Computing Technology II 3.0 Credits
This course will cover special topics of interest to students in the Computing Technology Major. May be repeated for credit.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated 4 times for 12 credits

CT 393 Information Technology Security Risk Assessment 3.0 Credits
This course addresses risk management methodology, the specific procedures for determining assets valuation, vulnerabilities, and threats. Risk migration methods that security professional use to protect valuable IT assets will also be studies. Issues, designed to foster critical thinking, are explored, as well as the standardized approaches to risk management.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

CT 400 Network Security 3.0 Credits
This class focuses on the security aspects of networks. Topics covered: intrusion detection, VPN, and Firewalls. This course is designed to provide students with the necessary skills and information aligned with Securing Networks.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CT 330 [Min Grade: D]

CT 402 Network Security II 3.0 Credits
Theory, methodology of Security firewalls, Topics include: firewall models, user interfaces, feature sets, interfaces, routing, IP addressing services, IP multicast support, monitoring with SNMP, authentication, authorization, and accounting, address translation, traffic content filtering, application inspection, traffic shunning, and firewall failover.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: CT 400 [Min Grade: D]

CT 412 Information Technology Security Policies 3.0 Credits
This course presents the theory and legal issues necessary for students to acquire fundamental knowledge of Computer Policies for information Security. Topics covered include: E-mail, Employee Privacy, Labor Organization Activities (Fair Use), Avoiding Discrimination and Harassment, Copyright, Defamation, Spamming, Trade Secrets & Confidential Information, Attorney-Client communication via E-mail, Computer Security, Preventing Waste of a Computer Resources, Essentials for Good Policy, and Ensuring Compliance.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

CT 414 Ethical Hacking and Penetration Testing 3.0 Credits
This course provides students with the opportunity to learn hands-on techniques to protect and secure their information-critical infrastructure against cyber-attacks, viruses, worms, and other system cyber vulnerability weaknesses that pose significant threat to organizational systems.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CT 140 [Min Grade: D] and CT 200 [Min Grade: D] and CT 210 [Min Grade: D]

CT 415 Disaster Recovery and Continuity Planning 3.0 Credits
Disaster Recovery & Continuity Planning specific to Emergency Recovery Procedures. Techniques for development of disaster recovery plans, procedures and testing methods. Strategies used by businesses to assure that sensitive data will not be lost in the event of a disaster. Techniques used to manage potential risk within multiple environments.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

CT 432 Information Technology Security Systems Audits 3.0 Credits
This course presents the theory, methodology, procedures and hands-on labs necessary for students to acquire a fundamental working knowledge of IT System Audits. Students learn how to discover system vulnerabilities with proper audit procedures, and how to document their findings properly for upper management.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CT 420 [Min Grade: D] or CT 301 [Min Grade: D]

CT 491 [WI] Senior Project I 3.0 Credits
This course is an independent project which small student teams
determines and scopes an appropriate computing technology project
that can be completed within the constraints of time and resources under
faculty guidance. The objective of the course is to provide specifications
and requirements for the team project.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.

CT 496 [WI] Senior Project II 3.0 Credits
This course is a continuation of Senior Project I. In this course, student-
teams are required to implement theirs project specifications and
requirements developed in the previous course.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: CT 491 [Min Grade: D]

CT I199 Independent Study in CST 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

CT I299 Independent Study in CST 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

CT I399 Independent Study in CST 0.5-9.0 Credits
Provides individual study or research in computing and security
technology with faculty supervision. This course may be repeated for
credit.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated 2 times for 6 credits

CT I499 Independent Study in CST 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

Computing and Informatics

Courses

CI 101 Computing and Informatics Design I 2.0 Credits
Introduces computing and informatics through a combination of lectures
and hands-on laboratory exercises. Lectures emphasize an integrated
view of topic areas and systems, spanning low-level software and
implementation issues to high-level use and acceptance by individuals
and communities. Lab exercises allow students to explore familiar
systems in unique and novel ways to better understand how these
systems are designed and used.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

CI 102 Computing and Informatics Design II 2.0 Credits
Introduces computing and informatics through a combination of lectures
and hands on laboratory exercises. Lectures emphasize an integrated
view of topic areas and systems, spanning low level software and
implementation issues to high level use and acceptance by individuals
and communities. Lab exercises allow students to explore familiar
systems in unique and novel ways to better understand how these
systems are designed and used.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

CI 103 Computing and Informatics Design III 2.0 Credits
Follows CI 102 in the Computing & Informatics design sequence.
Introduces computing and informatics through a combination of lectures
and hands-on laboratory exercises. Lectures emphasize an integrated
view of topic areas and systems, spanning low-level software and
implementation issues to high-level use and acceptance by individuals
and communities. Lab exercises allow students to explore familiar
systems in unique and novel ways to better understand how these
systems are designed and used.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CI 102 [Min Grade: D]

CI 106 Computing & Informatics Design Project 4.0 Credits
Introduces computing and informatics through a term-long design project.
Lectures emphasize an integrated view of topic areas and systems,
spanning low-level software and implementation issues to high-level use
and acceptance by individuals and communities. Lab exercises allow
students to explore familiar systems in unique and novel ways to better
understand how these systems are designed and used.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

CI 120 CCI Transfer Student Seminar 2.0 Credits
Introduces students to the academic and co-curricular aspects of
university life. Includes academic functions such as reflection papers,
reading, and study skills, as well as co-curricular functions such
as campus resources, activities, and social programs. Aids in the
transition to student life at Drexel and is designed to help each student
achieve academic and personal success through academic and career
exploration.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

CI 489 Seminar in Computing and Informatics 1.0-3.0 Credit
This seminar in Computing and Informatics allows for enrichment
discussion and laboratory experimentation in selected topics for a cohort
of students.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

**CI 490 Undergraduate Research Experience in Computing and
Informatics 1.0-6.0 Credit**
This research seminar in Computing and Informatics supports and
enriches undergraduate research projects with a cohort experience
practicing research talks, writing a research paper in Computing and
Informatics, and conducting experiments.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

CI 491 [WI] Senior Project I 3.0 Credits
Part of a multi-term capstone experience involving in-depth study and application of computing and informatics. Students work in teams to develop a significant product. Requires use of a development process that includes planning, specification, design, implementation, evaluation, and documentation. This course is writing intensive.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 451 [Min Grade: D] or INFO 324 [Min Grade: D] or INFO 442 [Min Grade: D] or SE 310 [Min Grade: D]

CI 492 [WI] Senior Project II 3.0 Credits
Part of a multi-term capstone experience involving in-depth study and application of computing and informatics. Students work in teams to develop a significant product. Requires use of a development process that includes planning, specification, design, implementation, evaluation, and documentation. This course is writing intensive.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CI 491 [Min Grade: D]

CI 493 [WI] Senior Project III 3.0 Credits
Part of a multi-term capstone experience involving in-depth study and application of computing and informatics. Students work in teams to develop a significant product. Requires use of a development process that includes planning, specification, design, implementation, evaluation, and documentation. This course is writing intensive.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CI 492 [Min Grade: D]

Construction Management

Courses

CMGT 101 Introduction to Construction Management 3.0 Credits
This course will introduce the basic history and management concepts of the construction industry to students with the expectation that upon completion students will have an overview of the industry. Career choices, industry firms, and key players in the Construction Management process will be explored.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Junior or Senior

CMGT 161 Building Materials and Construction Methods I 3.0 Credits
This course is designed to explore the range of building materials in use today and their interrelationships in a construction project. Topics will include a study of the major components of construction materials, the selection process, specification, alternatives, procurement, placement and quality management for the building systems covered. Foundations, excavations, wood framing and steel construction and the role these materials play in the success of a project once chosen will be considered and evaluated.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is AE or major is CIVE

CMGT 162 Building Materials and Construction Methods II 3.0 Credits
Continues CMGT 161. Covers concrete, reinforced concrete, site cast and pre-cast concrete, brick and concrete masonry, reinforced masonry, and properties of these materials and construction methods associated with them.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is AE or major is CIVE
Prerequisites: CMGT 161 [Min Grade: D]

CMGT 163 Building Materials and Construction Methods III 3.0 Credits
Continues CMGT 162. Covers roofing systems, glass, glazing, windows, doors, cladding systems, interior finishes, the properties of these materials and construction methods associated with each of them.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is AE or major is CIVE
Prerequisites: CMGT 162 [Min Grade: D]

CMGT 240 [WI] Economic Planning for Construction 3.0 Credits
Covers techniques for economic decision making for building and infrastructure construction topics. Topics include cash flow, present worth analysis, equivalent annual worth, rate of return, risk analysis, and benefit/cost analysis.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is AE
Prerequisites: MATH 121 [Min Grade: D]

CMGT 251 Construction Surveying 3.0 Credits
Covers the theory and use of surveying instruments and principles of plane and topographic surveying. Introduces satellite positioning, geomatics, and other modern surveying techniques related to construction.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is AE
Prerequisites: MATH 121 [Min Grade: D]

CMGT 261 Construction Safety 3.0 Credits
Covers OSHA liability, general safety, hazard communication, fire, material handling, tools, welding, electricity, scaffolding, fall protection, cranes, heavy equipment, excavation, concrete, ladders and stairways, confined space entry, personal protective equipment, and health hazards. Course approved by the osha Training Institute.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is AE or major is ARCH or major is CIVE or major is CMGT or major is EE.
Cannot enroll if classification is Freshman

CMGT 262 Building Codes 3.0 Credits
Familiarizes students with the content of the boca International Building Code (emphasizing the non-structural provisions), the purpose and intent of code requirements, and how to apply the code to structures and occupancies. Examines how the code is used as a tool in design and construction and prepares students for the advent of a single model building code planned for the nation.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is AE or major is ARCH or major is CIVE or major is CMGT or major is EE.
Cannot enroll if classification is Freshman

CMGT 263 Understanding Construction Drawings 3.0 Credits
This course examines a variety of construction documents, including drawings, details, graphic standards, sections, and quantities for competitive bidding and execution of projects. Both residential and commercial construction documents will be examined.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CMGT 101 [Min Grade: D] and CMGT 161 [Min Grade: D]

CMGT 265 Information Technologies in Construction 3.0 Credits
The objective of this course is to expose students to a large variety of information technologies in construction and will discuss the impact of these technologies on work environments, processes, and work quality. Students will investigate a variety of issues surrounding IT in construction including implementation, standards, integration, knowledge management and the underlying technology.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

CMGT 266 Building Systems I 3.0 Credits
This course covers construction management and design concepts relating to heating, ventilation, and air conditioning systems and the integration of these systems into the building design and construction process.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHYS 182 [Min Grade: D]

CMGT 267 Building Systems II 3.0 Credits
Continues CMGT 266. This course covers construction management concepts relating to electrical systems, wiring, lighting, signal and data systems, and transportation systems and the integration of these into the building design and construction process.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CMGT 266 [Min Grade: D]

CMGT 270 Principles of Statics for Construction Management 3.0 Credits
This algebra-based course is the study of forces acting upon structural elements. Analytic and graphic methods are used to illustrate resultants and reactions, equilibrium, centroids and moments of inertia applied to static structures. Analysis includes stress, strain, axial loading, bending, and deflection of beams.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MATH 110 [Min Grade: C-] and (PHYS 151 [Min Grade: C-] or PHYS 101 [Min Grade: C-] or PHYS 182 [Min Grade: C-])

CMGT 355 Introduction to Sustainability in Construction 3.0 Credits
An overview of the design and construction of high performance buildings. Students will gain topical familiarity with the wide range of issues related to sustainable design and construction. The USGBC's green building certification program will be covered in detail. Both historical and contemporary case studies will be utilized.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

CMGT 361 Contracts And Specifications I 3.0 Credits
Analyzes construction contracts, specifications, and practices with regard to business law and liability. Required for construction management students. Elective for others. Fall.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

CMGT 362 Contracts and Specifications II 3.0 Credits
Continues CMGT 361. Examines contractor, architect, and engineer responsibilities through case studies and class discussions. Winter.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CMGT 361 [Min Grade: D]

CMGT 363 Estimating I 3.0 Credits
Covers discussion of the estimating function and review and applications of material quantity survey techniques used in estimating costs of construction projects. Includes types of approximate and precise methods of estimating and their uses, and computer applications. Required for construction management students.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MATH 110 [Min Grade: D] and CMGT 263 [Min Grade: D]

CMGT 364 Estimating II 3.0 Credits
Covers pricing and bidding of construction work including cost factors, labor and equipment, productivity factors, prices databases, job direct and indirect costs, methods of estimating time, materials, equipment, subcontractors' work, general expenses, and profit, bid preparations and submission, and computer applications.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CMGT 363 [Min Grade: D]

CMGT 365 Soil Mechanics in Construction 4.0 Credits
Gives an overview of the types of problems encountered in geotechnical construction. Subjects covered will be composition, groundwater fundamentals, settlement and consolidation, stability of earth slopes, types of foundations and behavior of difficult soils.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: CMGT 161 [Min Grade: D] and MATH 121 [Min Grade: D] and PHYS 182 [Min Grade: D]

CMGT 366 Construction Accounting and Financial Management 3.0 Credits
This course brings together all of the key principles from general business accounting, financial management, and engineering economics needed by construction managers vis-a-vis the unique characteristics of the construction industry, and addresses how these principles are specifically applied in the construction industry, and how they should interact effectively to ensure the efficient and profitable management of construction projects and companies.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ACCT 116 [Min Grade: D] and CMGT 364 [Min Grade: D] and CIVE 240 [Min Grade: D]

CMGT 371 Structural Aspects in Construction I 3.0 Credits
The first of two course series designed specifically for construction management majors. The sequence addresses the interactions of different kinds of loads with common structural elements and design considerations for typical construction materials. This course places emphasis on the design of wood framed construction.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: CMGT 161 [Min Grade: D] and MATH 121 [Min Grade: D] and PHYS 182 [Min Grade: D]

CMGT 372 Structural Aspects in Construction II 3.0 Credits
The second part in a two-course sequence for Construction Management majors. The course places emphasis on the design and analysis of concrete and steel frame construction.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CMGT 371 [Min Grade: D]

CMGT 375 Building Information Modeling in Construction 3.0 Credits
This course is intended to provide students with a hands-on introduction to Building Information Modeling (BIM) in Construction. Emphasis will be placed on the use of BIM to support current construction activities such as design review, coordination, scheduling, logistics, estimating, and project close-out. Topics will include an introduction to 3D BIM modeling, 3D coordination and clash detection, 4D visual scheduling and logistics, 5D estimating, and BIM for Facility Management. Students will learn the fundamentals of the most widely used software applications in the construction industry: SketchUp, Revit and Navisworks.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CMGT 265 [Min Grade: D]

CMGT 385 [WI] Selling and Negotiation Techniques in Construction 3.0 Credits
Applies negotiation and marketing principles to the construction industry. Includes understanding the roles of market research, business development planning, negotiation and networking techniques. Students will acquire the skills and techniques to prepare a winning presentation and negotiations.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

CMGT 450 Management of Field Operations 3.0 Credits
This course is intended to equip students with knowledge and skills required to successfully manage and support construction field operations. Knowledge areas include contract administration, project engineering, site superintendence, and other topics critical to field operations.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is AE or major is ARCH or major is CHE or major is CIVE or major is CMGT or major is CPM or major is EE or major is IAD or major is PRMT.
Cannot enroll if classification is Freshman or Sophomore

CMGT 451 Heavy Construction Principles & Practices 3.0 Credits
This course is intended to provide students an introduction to the principles and practices employed in heavy construction. The course content is presented from a practical perspective focusing on actual field applications.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is AE or major is ARCH or major is CHE or major is CIVE or major is CMGT or major is EE or major is IAD or major is INTR.
Cannot enroll if classification is Freshman or Pre-Junior or Sophomore

CMGT 461 Construction Management 3.0 Credits
Covers construction management concepts and practices, the management system, construction planning and programming, project control, environmental management, total quality management, and ethics in construction management. Winter.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is AE or major is ARCH or major is CIVE or major is CMGT or major is INTR and classification is Junior or Pre-Junior or Senior.

CMGT 463 Value Engineering 3.0 Credits
Covers the value concept, value engineering job plan, and techniques of project selection.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is AE or major is ARCH or major is CHE or major is CIVE or major is CMGT or major is EE or major is INTR or major is PRMT.
Cannot enroll if classification is Freshman or Pre-Junior or Sophomore

CMGT 467 Techniques of Project Control 4.0 Credits
This course covers construction planning, scheduling, network systems, and communications required for project control, diagram logic, and Earned Value Analysis.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is AE or major is ARCH or major is CIVE or major is CMGT or major is CPM or major is EE or major is ENGR or major is IAD or major is MECH or major is MSE or major is PRMT or major is PROJ.
Prerequisites: CMGT 363 [Min Grade: D]

CMGT 468 Real Estate 3.0 Credits
Overview of the development process including site selection, residential densities, market analysis and cash flow analysis.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

CMGT 469 Construction Seminar: Contemporary Issues 3.0 Credits
This course is intended to prepare students for professional practice through a survey of the current and future state of the industry.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Junior or Pre-Junior or Sophomore

CMGT 470 Productivity in Construction 3.0 Credits
Explores the evaluation of construction management's effectiveness. Overview of techniques required for improvement of construction field efficiency including quality management, productivity measurements, method improvement, human factors, and communications.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

CMGT 485 Habits of Successful Design and Build Construction 3.0 Credits
The course develops specific and essential skills necessary for success within the construction workforce and project environments. Students will learn to convert virtues to habits for life and career success in the challenges of the construction industry. Strategic skills in planning and scheduling, information handling, critical event completion, problem solving, negotiating, and team-building techniques crucial to the construction process will be analyzed and developed.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CMGT 385 [Min Grade: D]

CMGT 486 Leading in the Construction Industry 3.0 Credits
Leadership fundamentals for Constructors. Investigation of self mastery to include behavioral profiles and emotional intelligence quotients to establish a baseline for skill development and personal growth required in the construction industry. Engagement in team building and communication models. Examination of leadership traits and skills through analysis of theory and comparison of construction industry leaders.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CMGT 485 [Min Grade: D]

CMGT 491 Senior Capstone I 3.0 Credits
First component of a three-part capstone series. It is the initial problem proposal phase. Students meet with clients and establish project goals, budget, and timeline. Emphasis on proposal writing, defining customer needs, and effective presentation skills.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: CMGT 364 [Min Grade: D] and CMGT 385 [Min Grade: D]

CMGT 492 Senior Capstone II 3.0 Credits
Continues CMGT 491. This course requires preparation of options and alternative solutions to the problem defined in the proposal phase. It requires a written and oral progress report.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: CMGT 491 [Min Grade: D]

CMGT 493 Senior Capstone III 3.0 Credits
Continues CMGT 492. Requires presentation of alternative solutions to client representatives in both oral and written reports.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: CMGT 492 [Min Grade: D]

CMGT I199 Independent Study in CMGT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CMGT I299 Independent Study in CMGT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CMGT I399 Independent Study in CMGT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CMGT I499 Independent Study in CMGT 0.0-4.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if classification is Senior.

CMGT T180 Special Topics in CMGT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CMGT T280 Special Topics in CMGT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

CMGT T380 Special Topics in CMGT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

CMGT T480 Special Topics in CMGT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

Cooperative Education

Courses

COOP 001 Co-op Essentials 0.0 Credits
Co-op Essentials is an accelerated version of the required course for co-op students, COOP 101. It is designed for non-traditional students with significant work history. The course covers all of the essential job development topics including, introduction to the SCDC and SCDConline, resumes, interviewing, and workplace issues. The emphasis of Co-op Essentials is on integrating and adapting the student's previous experience to a co-op environment.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if concentration is 4COP or concentration is 4TOP or concentration is 5COP or concentration is 5TOP.

COOP 101 Career Management and Professional Development 0.0 Credits
Prepares new students to achieve success, personally and academically, in their first co-operative education experience. Topics covered include career exploration, resume skills, interview techniques, professional conduct in the job search, contemporary workplace issues, and job searching and the Internet.
College/Department: University Courses
Repeat Status: Not repeatable for credit

COOP 201 Co-op Experience 16.0 Credits
College/Department: University Courses
Repeat Status: Can be repeated 6 times for 96 credits

COOP 250 Professional Skills Enrichment 0.0 Credits
Professional Skills Enrichment is designed to enable the student to hone their job search skills. Taught as a series of workshops, each class focuses on a different career-related topic including Networking, Utilizing Social Networking Sites, and Mastering the Interview. Students are required to attend a mock interview and participate in a mock networking event.
College/Department: University Courses
Repeat Status: Not repeatable for credit

Creativity Studies

Courses

CRTV 301 Foundations in Creativity 3.0 Credits
This course provides a foundation in creativity including leading creativity theorists and their ideas, and introduction to creativity in many fields. Students will explore basic creative characteristics including originality, fluency, flexibility, elaboration, resistance to premature closure, and tolerance of ambiguity. Sets the foundation for acquiring tools and applying creativity.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

CRTV 302 Tools and Techniques in Creativity 3.0 Credits
This hands-on course provides tools for enhancing creative strengths including role-play, simulation, brainstorming together with synectics, and creative problem solving. A second focus is the role of inspiration in how creativity, personal maturity, and spirituality inter-relate and how this interaction expands our repertoire of tools and techniques in creativity.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

CRTV 303 Creativity in the Workplace 3.0 Credits
This course focuses on how creative ideas happen and how they become innovations to reveal a set of principles for infusing creativity into every aspect of an organization. Examples from a wide range of settings demonstrate how to build systemic creativity at the individual, team, and leadership levels.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

CRTV T180 Special topics in CRTV 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

CRTV T280 Special topics in CRTV 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

CRTV T380 Special topics in CRTV 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

CRTV T480 Special topics in CRTV 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

Criminology & Justice Studies

Courses

CJS 100 Freshman Seminar in Crime and Justice 3.0 Credits
This is an entry level course for CJS freshman that introduces them to the norms of academic writing and comprehension in the disciplines of criminology and criminal justice. During the course students will read a combination of classic and current volumes in criminology to initiate them into the academic discipline. The course will be mostly seminar-style, which means students will engage in active learning through reading, writing, and discussion.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 101 Introduction to Criminal Justice 3.0 Credits
This course provides a survey of the criminal justice system with the primary goal of conveying an understanding of America's formal response to crime. We confront the long-standing struggle to balance due process with crime control through the lenses of the police, courts and corrections -- the core elements of the Criminal Justice system. We also examine major crime control paradigms (historic and current), and the tenuous relationship between race and justice. The course offers a variety of educational approaches in an effort to match (as much as is reasonable) students' individual learning styles and needs.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 200 Criminology 3.0 Credits
This course examines the myriad factors that explain crime and criminal behavior. The course describes prevalences of different crime types across various populations and geographic areas to help students understand how and why crime often clusters within certain settings. The Course reviews major theories of crime developed over the past two hundred years to help explain crime and the labeling of criminal offenders. The course will draw on references from popular culture to help provide a context for crime and crime causation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 210 Race, Crime, and Justice 3.0 Credits
This course considers how race affects the behaviors of the major institutions of the justice process, as well as how the justice process affects social perceptions of race and crime. The course also describes the relationships among race, criminal offending, and victimization; and it explores how justice--#related outcomes are often influenced by the quality and behaviors of local schools, access to housing, economic investment in majority--#minority communities, crime control strategies, and the perceived fairness of the justice process itself.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 220 Crime and the City 3.0 Credits
This course reviews the nature of crime and disorder in cities from the urban industrial revolution through the so-called "Crime Drop" of the early 2000s. The course opens with an overview of urbanization, contrasting the "best" with the "worst" aspects of the industrial revolution on human life. It then examines urban drug markets, violence, and policing before moving into a discussion of the crime "peak" of 1992. The course then follows the ensuing crime drop, examining demographic, economic, and cultural factors that may explain the national crime decline. The course then focuses on violence as a public health issue and on how crime, incarceration, health, housing, and education are all tied to urban crime policy.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 250 Research Methods & Analytics I 3.0 Credits
This is the first of three integrated methods and analysis courses for CJS students that introduces them to the fundamentals of research design, the benchmarks of scientific quality, sampling, modes of observation, and units of measurement. The course also introduces students to the most relevant analytical procedures often used at each stage in the methodological process, such as developing a data set, performing descriptive (univariate) analyses, examining bivariate relationships, and testing hypotheses using both parametric and non-parametric statistical tests. The course culminates with students writing a research proposal that includes the major components of most grant applications: Statement of the Problem, Literature Review, Research Questions, and Research Methodology/Analytical Procedures.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 260 Justice in Our Community 4.0 Credits
This course is a seminar style community-based learning course that will begin with an introduction to justice in urban communities and examine problems unique to cities. The course format will include lectures and on-site work with our community partners at UConnect. The synthesis of scholarship and community classroom experience will provide a holistic lens in which to explore issues in our urban community. Topics include urban economies, access to education and health care, digital divides and crime. Students who take this course will also register for one recitation section of CJS 260.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 261 Prison, Society and You 3.0 Credits
This course utilizes the Inside--#Out Prison Exchange Program to explore the relationship between individuals and the prison system. The Inside--#Out Exchange Program is an evolving set of projects that creates opportunities for dialogue between those on the outside and those on the inside of the nation's correctional facilities. The program demonstrates the potential for dynamic collaborations between institutions of higher education and correctional institutions. Most importantly, through this unique exchange, Inside-Out, this course seeks to deepen the conversation and transform ways of thinking about crime and justice (Crabbe, Pompa, 2004).
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 265 Criminal Investigation 3.0 Credits
This course introduces students to the broad field of criminal investigations. It examines the elements of an effective investigation, the equipment, technology and procedures used to complete successful investigations. It also covers note taking, crime scene photography and sketching, searching the crime scene, identifying and collecting physical evidence, and arresting and searching suspects.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 266 Crime Prevention Planning 3.0 Credits
The course will explore the role of places and environments on criminal opportunities. By analyzing residential and business layouts, street networks, and routine activities of individuals, the course will seek ways in which situational crime prevention methods may then be applied for preventing criminal behavior in both the public and private settings.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 267 Introduction to Security Studies 3.0 Credits
This course examines the private security industry. Substantive topics of interest include the historical development of the industry; its linkage to public forms of security (law enforcement and the regulatory state); its legal underpinnings; management issues; and the nature of internal and external threats faced by facilities and organizations. The philosophical and analytic paradigm for security -- risk analysis and prevention -- offers a framework for the study of problem solving models used in the field. This framework, along with the analytic models utilized by security professionals will be explored in depth.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 273 Surveillance, Technology, and the Law 3.0 Credits
This course will examine current surveillance technologies used by criminal justice agencies and private sector organizations and the laws that regulate government surveillance and protect privacy.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 274 Sex, Violence, & Crime on the Internet 3.0 Credits
This course explores how offenders are adopting computers to commit traditional crimes in a high-tech manner. Specific attention will be paid to the following types of crime: cyberstalking, online harassment, cyberbullying, sexting, and computer-facilitated sexual exploitation of children. Related legislation and current law enforcement practices to address these crimes will be examined.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 275 Issues in Domestic Violence 3.0 Credits
Domestic Violence is a familiar phrase, but what does it really mean? How often does it occur? Is it a new phenomenon? Do other countries view domestic abuse as a problem? In our class we will examine these questions using broad conceptual frameworks. It will then explore the definitional aspects of domestic violence, common characteristics of victims and offenders, as well as the historic, current, and emerging criminal justice responses to domestic violence.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 276 Introduction to Computer Crime 3.0 Credits
This course provides an overview of computer crime. Emphasis will be placed on the legislative responses and policy issues related to computer intrusions and cyberfraud. Issues encountered when informing laws in cyberspace and the public/private sector initiatives for dealing with computer crime will also be explored.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 277 Introduction to Correctional Practices 3.0 Credits
This course provides insight into the Correctional component of the Criminal Justice System. Students will learn and understand correctional theory, over view of correctional facilities management and practice and contemporary issues in the field of corrections, including re-entry and alternatives to incarceration. Emphasis will be placed on actual real world experiences based upon the Philadelphia Prison System. Course material will be presented through the required textbook, court opinions from legal cases, handouts, classroom lecture and discussion, on-site visits and tours of the various Philadelphia Prison System facilities and guest lectures and demonstrations.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 278 Introduction to Law Enforcement 3.0 Credits
This course examines the implications of maintaining an armed police force in a democratic society whose mandate requires it to enforce laws under the tacit threat of coercion. The course explores different styles of policing that are commonly found in urban, rural, and suburban locations; and it examines the rise and consequences of historic crime control paradigms, such as the War on Drugs, and the War on Terrorism. It offers an overview of Supreme Court decisions that have most affected police functions and authority. And it will highlight the police use of technology for the purposes of coercion, surveillance, and communication.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 280 Communities and Crime 3.0 Credits
This course introduces students to the ecological study of crime. Crime varies in time, space, and populations as it reflects neighborhood structures and the routine social interactions that occur in daily life. Concentrations of crime can be found among locations, with antisocial activities like assaults and theft occurring at higher rates because of the demographic make-up of people (e.g., adolescents) or conflicts (e.g., competing gangs), for reasons examined by ecological criminology. We examine variations in socio-demographic structures (age, education ratios, and the concentration of poverty) and the physical environment (housing segregation, density of bars, street lighting) predicts variations between neighborhoods in the level of crime and disorder.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 289 Terrorism 3.0 Credits
This course examines the varying types and purposes of terrorism and its application. It will discuss the problems with definitions, worldviews and ideologies, and how these affect both the perceptions and responses to terrorist events.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 290 Crime and Public Policy 3.0 Credits
This course focuses on criminal justice and non-criminal justice policies used to combat crime. Students will use the most recent crime data and explanatory theories on crime to evaluate current policy. A multi-disciplinary approach will be used to develop new policies designed to have a long-lasting impact on crime.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 295 International Field Experience 1.0-3.0 Credit
This course provides students the opportunity to process and contextualize their recent Intensive Course Abroad (taken through Drexel's Study Abroad Office). By keeping an extensive travel journal, participating in all activities while abroad, and through a series of written reflection assignments, students will link their travel experiences with assigned academic materials to help them make meaning from their observations while on tour in the relevant host countries.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CJS 300 Research Methods and Analytics II 3.0 Credits
This course builds on (and reviews) the fundamentals of research design introduced in Methods and Analysis I with the specific aim of teaching students how to construct, and analyze data generated from, surveys. Students will learn the "mechanics" of survey design, such as where to place demographic questions, as well as how to identify and include validated scales on the instrument, and how to avoid misleading or debilitative items (e.g., "double-barreled" questions, biased/leading questions, non-mutually exclusive or exhaustive response categories). Students will also learn the process (and importance) of pre-testing the survey prior to implementing it; and they will be trained to analyze survey results using SPSS and other software packages as needed.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CJS 250 [Min Grade: C]

CJS 301 Methods and Analytics III 4.0 Credits
The course focuses on the development of a community needs assessment as a platform for giving students the opportunity to work as part of a research team in the field, creating a data collection instrument, collecting and analyzing data, and reporting the findings. The course integrates the community needs assessment methodology with the urban disorder literature to educate students in the modes of observation required to reliably measure crime, disorder, surveillance gaps, and other sources of community risk. Students will map community demographic features, develop an assessment tool, make field observations, and analyze the findings as part of their culminating experience.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CJS 300 [Min Grade: C]

CJS 302 Advanced Criminological Theorizing 3.0 Credits
This course offers a detailed examination of several major theories of crime. Whereas CJS200/CJ204-Criminology represents a survey of many criminological theories, this advanced course focuses on three major perspectives in criminology: Life-course, genetics/bio-social, social disorganization (and specifically, subculture of violence) theories. The course also helps students understand how different criminological theories might integrate with each other to offer broad perspectives the causes of crime.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CJS 200 [Min Grade: C] or CJ 204 [Min Grade: C]

CJS 320 Comparative Justice Systems 3.0 Credits
This course offers students a transnational perspective on crime and justice institutions. As the world increasingly globalizes, it becomes increasingly important to understand how countries outside the United States undertake the processes of detecting crime, labeling people "criminal," and adjudicating criminal offenders. Is there a common threshold in other countries for determining guilt? Is there a universal standard that governs the presumption or guilt or innocence at the onset of the criminal justice process? How many other countries still use the death penalty? These are questions the course will address in addition to others related to policing, courts, and corrections.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 330 Crime Mapping I Using Geographic Information Systems 4.0 Credits
This course introduces students to the fundamentals of crime mapping through both lecture and the use of geospatial software. The course opens with a history of crime mapping, then moves to an examination of several place-based theories of criminology that help explain why crime events often cluster in time and space. The course then uses scenario-based exercises to teach students to work with and manage geospatial data, conduct select spatial analyses, interpret the results of such analyses within the contexts of different criminological theories, and create maps that illustrate spatial patterns and relationships across different units of geography.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 331 Crime Mapping II Using Geographic Information Systems 4.0 Credits
This course takes up where Crime Mapping I leaves off by teaching students some of the intermediate to advanced techniques of crime mapping using geospatial software. The course opens with a brief review of the fundamentals of crime mapping, then moves into some of the more advanced mapping/software applications that support complex analyses and visualizations. Students will learn to manipulate attribute tables, select by spatial locations, create spatial buffer and distance surfaces, convert vector data to raster data, and assess for spatial autocorrelation and clustering. They will also learn to detect and work with spatial outliers.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CJS 330 [Min Grade: C]

CJS 360 Juvenile Justice 3.0 Credits
Students will learn about the history, development and current status of the juvenile justice system. Philosophical, sociological, psychological, legal and political factors contributing to the changes in the manner in which society processes children and youth who violate social norms will be explored in research articles, legal decision, and theoretical analyses.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 362 Gender, Crime, and Justice 3.0 Credits
This term will explore the historical roots of crime and how we study crime specifically; we will critically analyze female crime trends and statistics, gender and the law, and female offending. After laying a strong foundation, we will connect gender and crime by exploring rape, pornography, and domestic violence, sex trafficking and female gangs.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 364 Community Corrections 3.0 Credits
This course is a comprehensive, up-to-date, coverage of evidence-based practices and research for probation, release from prisons and other community-based alternatives in their historical, philosophical, social and legal contexts illustrated with real life examples.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 365 Computer Investigations and the Law 3.0 Credits
This course will examine the techniques used to investigate Internet crimes and extract evidence from digital storage devices. Specific attention will be paid to the procedural laws that govern digital forensic techniques and investigations involving electronic evidence.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 366 Technology and the Justice System 3.0 Credits
This course will examine past and current technologies adopted in the field of criminal justice to assess their usefulness in identifying and preventing crime and advancing justice. We will also discuss technologies on the horizon that are likely to be adopted by criminal justice agencies. Additionally, methods for evaluating technology use will be examined.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 369 Forensic Science Survey Course 3.0 Credits
This survey course introduces some principles and techniques of forensic science as they pertain to crime scene investigation and crime laboratory analysis. The course is designed to be accessible to those without a science background, but at the same time will provide a well-rounded introduction to some topics for those considering further studies in the field.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 372 Death Penalty - An American Dilemma 3.0 Credits
Capital punishment is one of the most complex issues in Criminal Justice and one of the most controversial facing America. Everyone has an opinion about the death penalty but rarely is it grounded in hard evidence. This course will examine the history of the use of capital punishment in America by reviewing the relevant case law in this area and will explore in-depth the issues which rise from the use of the Death Penalty in this country. Is it ethical? Is it fairly administered? Is it effective? Should it be reformed? Can it be reformed?.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 373 Environmental Crime 3.0 Credits
The objective of this course is to provide students with an introduction to and overview of the federal criminal enforcement program concerning the criminal prosecution of certain types of violations of federal environmental laws and regulations. Although the focus of the course will be on the federal government's environmental crimes program that is administered by the United States Environmental Protection Agency, general concepts concerning criminal law and procedure will also be discussed. More specifically, topics to be covered will include, among other things: the history of the federal environmental crimes program; the role of EPA-CID Special Agents and federal prosecutors in the investigation and prosecution of environmental crimes; environmental offenses under the federal Federal Acts.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 374 Restorative Justice 3.0 Credits
Restorative justice is a paradigm shift in criminal justice in response to the failure of the traditional retributive model to meet the needs of victims, offenders and the community. This course offers an overview of Restorative Justice, including its definitions, history, theoretical and legal basis, principles and practices, controversial issues, and evaluative research as to its efficacy and reducing crime and restoring victims and communities.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 375 Criminal Procedure 3.0 Credits
A solid understanding of constitutional criminal procedure is essential to any career in the law or law enforcement. Further, as America seeks to protect itself from terrorism, every citizen should understand the constitutional protections that Americans have historically enjoyed which have been and continue to be diminished by the courts and the legislature.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 376 Sentencing 3.0 Credits
We explore the theoretical basis for sentencing, including the purposes of sentencing, and determination of the just sentence, including the consideration of the crime, as well as the offender's background and criminal history. We cover contemporary issues like prosecutorial misconduct, plea bargaining, sentencing guidelines, mandatory minimums, truth in sentencing and the impact of racial and gender disparities. We also spend time investigating special issues within the field such as the sentencing of juveniles and capital sentencing procedures.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 377 Intellectual Property Theft in the Digital Age 3.0 Credits
This seminar focuses on the changing nature of intellectual property theft, piracy, and copyright infringement in the Digital Age. Attention will be paid to legislative and technical solutions for protecting copyrighted goods (including music, movies, and software) and the challenges faced when investigating the theft of intellectual property. Additionally, theoretical explanations to account for intellectual property theft will be explored.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 378 Science of Forensic Science 3.0 Credits
Forensics is the application of science or other disciplines to the Legal System. Students will study the science of science in application of ethics and scientific method to evidence analysis and presentation of data to Court. Students will learn to recognize and deal with context, observer, expectancy, and experimenter effects. Data from actual cases will be discussed.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 379 Forensic DNA Analysis 3.0 Credits
An introduction to DNA analysis methods in current forensic testing. Genetics, inheritance, DNA biochemistry are applied to a fluorescent detection technology to produce results using one or more manufactured DNA testing kits. Students will be exposed to actual casework data and as virtual analyst present results to juries and judges.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

CJS 400 Capstone in Criminology and Justice Policy 3.0 Credits
The capstone course will be open only to Criminology and Justice Policy Seniors. This course serves as an opportunity for students to apply their cumulative knowledge in the Criminology and Justice Policy concentration to an identified crime, policy, and/or criminal justice deployment problem facing the field today. This may be a more global problem, such as mass incarceration across the United States, or a highly localized problem, such drug markets in an urban setting. Students will work in consultation with the professor and their class peers to identify a problem, and then develop an evidence-based solution to address the problem. The course culminates with students presenting their evidence-based solutions to the class at the end of the quarter.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CJS and classification is Senior.

CJS 401 Program Evaluation 3.0 Credits
This course will examine research designs and statistical methods often used when evaluating criminal justice programs or policies. The course will focus mostly on the conceptual, rather than the applied, giving students an opportunity to begin to synthesize the methods and techniques to which they were exposed in the previous methods and analytics courses. During the course, students will develop a proposal to conduct an evaluation of a policy and/or program, using a research design that meets the benchmarks of scientificquality; and they will incorporate several research and analytics strategies they learned in previous courses.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CJS 250 [Min Grade: C] and CJS 300 [Min Grade: C] and CJS 330 [Min Grade: C]

CJS 402 Capstone in Justice Informatics 3.0 Credits
The Capstone in Justice Informatics course calls upon students to integrate the concepts covered in the informatics, computing, analytical, and methodological courses in their major to develop a informatics-driven plan that addresses a problem pertaining to crime, criminality, or criminal justice. The course will culminate with students making a professional presentation of their plan/project to the class.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CJS and classification is Senior.

CJS I199 Independent Study in CJS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CJS I299 Independent Study in CJS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CJS I399 Independent Study in CJS 0.5-12.0 Credits
Provides a course of independent study in Criminology and Justice Studies. Topics for study must be approved in advance of registration by the advisor and the instructor involved.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CJS I499 Independent Study in CJS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CJS T180 Special Topics in Criminology & Justice Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CJS T280 Special Topics in Criminology & Justice Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CJS T380 Special Topics in Criminology and Justice Studies 0.0-12.0 Credits
This course will explore current issues and interests in Criminology and Justice Studies. The topic will vary each term.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

CJS T480 Special Topics in Criminology & Justice Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Culinary Arts

Courses

CULA 115 Culinary Fundamentals 3.0 Credits
Introduces culinary principles and procedures used in commercial food preparation and practical application of classical culinary techniques.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

CULA 120 Techniques and Traditions I 3.0 Credits
In this foundation culinary course, students will learn the fundamentals of a professional kitchen through lecture, demonstration and production. Classical and contemporary techniques are emphasized for development of cooking methods, knife skills, and food and kitchen safety and sanitation.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

CULA 121 Techniques and Traditions II 3.0 Credits
A continuation of CULA 120. Students will further develop their kitchen skills with application to recipe and menu development and plate design. Service to the public will be executed through various preparation techniques and types of service.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 120 [Min Grade: D]

CULA 125 Foundations of Professional Baking 3.0 Credits
This course will introduce students to the foundations needed to work in a pastry kitchen. This hands-on lab class will help build students sense of timing and a delicate touch needed to produce classic bakery items such as pies, cookies, muffins, biscuits, pastry cream, and basic breads.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 115 [Min Grade: D] (Can be taken Concurrently)

CULA 216 A la Carte 3.0 Credits
This is a sophomore level course in dining operations designed around a weekly restaurant operation, which is marketed and delivered to the Drexel Community and general public.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 121 [Min Grade: D]

CULA 220 Patisserie I 3.0 Credits
Students will be introduced to a variety of techniques that are the foundations to creating restaurant quality desserts, including mousses, sorbets, custards, ice creams, and frozen desserts. Along with learning techniques, applications, and utilization of products dessert plating will be part of the students development.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CULA 125 [Min Grade: D]

CULA 225 Patisserie II 3.0 Credits
This course will further develop students sense of creativity, flavor, texture, color, and presentation skills. Building on knowledge and techniques already learned in previous courses, this course will provide students with knowledge and touch to produce professional quality desserts of all sizes from amuse bouche, petit fours, and sophisticated desserts.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CULA 220 [Min Grade: D]

CULA 226 Patisserie III 2.0 Credits
This advanced pastry course is the third in a series of related topics. Culinary students will have the opportunity to work with techniques in cake decorating, sugar and chocolate work, and candy making. Attention to detail in pastry arts will be emphasized in this course.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 225 [Min Grade: D]

CULA 227 Wheat and Grains: Artisan Breads 3.0 Credits
This course will introduce students to proper techniques in producing a variety of artisan breads. The course will allow students to create professional style breads and allow for fully developed yeast fermentation. Students will learn the skills, terminology, and calculations to produce artisan breads in volume.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 125 [Min Grade: D]

CULA 228 Design, Presentation, and Decorating in Pastry 3.0 Credits
This course will give students the foundation to create a variety of cakes for many special occasions. Students will learn to produce and utilize different types of icings, fondant, and cake styles to build numerous flavor and texture combinations. Along with the skills learned in garnishing student will create a variety of professional quality cakes.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 125 [Min Grade: D]

CULA 229 Confectionery 3.0 Credits
This course will give students an excellent foundation in understanding, taste, and usage of chocolate and its many forms. Students will learn to properly temper chocolate and then utilize it for creating garnishes and artisan candies. In addition the proper technique for sugar cookery will be learned and then applied for a variety of confections.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 125 [Min Grade: D]

CULA 235 Professional Dining Room Management 3.0 Credits
Students will manage front-of-the house operations in a professional dining room setting with fine dining service to the public. Table side preparations and cookery will be strongly emphasized with weekly executions.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 121 [Min Grade: D]

CULA 240 Fundamentals of Chinese Cuisine 3.0 Credits
Students will explore traditional regional preparations with Chinese ingredients, such as beef, fowl, lamb, vegetables and various fish and seafood.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 115 [Min Grade: D] or CULA 120 [Min Grade: D]

CULA 290 Culinary Arts Practicum I 3.0 Credits
Students will gain work experience in culinary production while under faculty supervision. Students obtain industry jobs, work a minimum of 60 hours, log their experiences, and write a final analysis. The networking opportunities often lead to rewarding co-op, part time, or full time employment opportunities. Students take CULA 290 or CULA 291.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CLSC or major is CULA.
Prerequisites: CULA 120 [Min Grade: D]

CULA 291 Culinary Arts Practicum II 6.0 Credits
Students will gain work experience in culinary production while under faculty supervision. Students obtain industry jobs, work a minimum of 120 hours, log their experiences, and write a final analysis. The networking opportunities often lead to rewarding co-op, part time, or full time employment opportunities. Students take either CULA 290 or CULA 291.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CLSC or major is CULA.
Prerequisites: CULA 120 [Min Grade: D]

CULA 300 Fundamentals of Vegetarian Cuisine 3.0 Credits
Vegetarian cooking is explored by examining ethnic specific global cuisines. Vegetable based diets are a result of geography, economics, politics, culture, religion and choice. By understanding and appreciating diverse peoples and their foods, the student will expand not only his or her culinary repertoire, but also achieve a greater global and cultural awareness.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CULA 120 [Min Grade: D] or CULA 115 [Min Grade: D]

CULA 303 Global Cuisine Studio 3.0 Credits
This course will serve as the foundation for a variety of ethnic cuisine options including French, Italian, Chinese, Korean, Indian, Caribbean and Island Cuisine.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 4 times for 15 credits

CULA 305 Fundamentals of Italian Cuisine 3.0 Credits
Students will be presented with the philosophy of traditional Italian cooking as it is articulated in the culture of Italy. There will be a strong emphasis on regional ingredients and recipes. Topics include: basic menu language, terminology, preparation of various antipasti, pasta, and risotto.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CULA 120 [Min Grade: D] or CULA 115 [Min Grade: D]

CULA 306 Advanced Italian Cuisine 3.0 Credits
A continuation of CULA 305. Utilizing regional Italian products, students will produce classical and traditional recipes with opportunity to further develop personal style and creativity. Proper seasoning, handling of product, and family style and plated presentations will be emphasized.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 305 [Min Grade: D]

CULA 310 Fundamentals of French Cuisine 3.0 Credits
The course explores the history, culture and persistent influence of the French 'methode' and its relevancy to the contemporary kitchen. The major French regional classic dishes and techniques will be studied and produced; each week visiting a different geographic locality from Provençe to Alsace.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CULA 120 [Min Grade: D] or CULA 115 [Min Grade: D]

CULA 311 Advanced French Technique 3.0 Credits
A continuation of CULA 310. This course more deeply explores the history persistent influence of the French 'methode' and its relevancy to the contemporary kitchen. Each week will examine on a single food category; Potages, Poisson, veau, volaille, Gibier. Patisserie, etc., as well as a significant figures in gastronomic history from Taillvent to Paul Bocuse and beyond — from the earliest origins of Haute Cuisine to Modernist and applications to evolving contemporary cuisine. Related topics of French art, culture and music will be included.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 310 [Min Grade: D]

CULA 315 Fundamentals of American Cuisine 3.0 Credits
The course provides a foundation in American regional cuisine by examining the history, diverse cultures and culinary traditions of the evolving United States from native Americans and first settlers to the present day. Students follow a culinary cultural journey through time and geography, preparing a variety of dishes from influential cuisines, in search of a definition for American Cuisine.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CULA 120 [Min Grade: D] or CULA 115 [Min Grade: D]

CULA 316 Butchery Laboratory 2.0 Credits
In this culinary lab course students will execute the fabrication of meat, fish and poultry products, skills necessary in any professional kitchen operation. Students will perform yield tests and calculate portion cost of fabricated items.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 115 [Min Grade: D] or CULA 120 [Min Grade: D]

CULA 320 Advanced Culinary Studio 3.0 Credits
Under the direction of culinary industry leaders and program faculty
students will prepare and produce finished plates using a variety of
previously learned skills. Finished products will reflect the style of
a chosen culinary industry leader executed with the judgment and
professionalism of the student.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 115 [Min Grade: D] or CULA 120 [Min Grade: D]

CULA 325 Garde Manger Laboratory 3.0 Credits
Introduces techniques used in the fabrication, selection and preparation of
cold buffet production. Items include cold appetizers, canapes, garnishes,
hors d'oeuvres, salads, and sandwiches. Additional focus on decoration,
form, and presentation of cold food items.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CULA 120 [Min Grade: D] or CULA 115 [Min Grade: D]

CULA 328 Brasserie Applied Baking 3.0 Credits
This course will develop students ability to cross utilize the mediums of
culinary arts and pastry arts. In almost every food service operation the
techniques and products made by both the savory and sweet kitchen
are seamlessly combined to create the menu. Students will focus on
combining both of these disciplines to create contemporary and classic
dishes.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 125 [Min Grade: D] and CULA 320 [Min Grade: D]
and CULA 325 [Min Grade: D] and CULA 227 [Min Grade: D]

CULA 330 Charcuterie 3.0 Credits
Students learn about the chemistry and techniques of curing, brining, and
smoking. Items covered include classic and modern, forcemeats, pates,
galantines, terrines, and sausages (fresh and dry).
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 115 [Min Grade: D] or CULA 120 [Min Grade: D]

CULA 335 Fundamentals of Indian Cuisine 3.0 Credits
This course introduces students to the diverse cooking and cultures of
India. Explores India's unique cooking methods and the varied use of
herbs, spices, and condiments.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 120 [Min Grade: D] or CULA 115 [Min Grade: D]

CULA 400 Directed Studies with a Master Chef 3.0 Credits
Structured program that allows students the opportunity to practice the
skills and competencies learned in coursework with an acknowledged
culinarian in a qualified foodservice operation. Students are monitored
by their direct supervisor, by Culinary Arts faculty, and by evaluation of
written reports, workbooks, journals, and portfolios prepared during the
course.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 115 [Min Grade: D] or CULA 120 [Min Grade: D]

CULA 405 [WI] Culture and Gastronomy I 3.0 Credits
The first of two courses devoted to the study of food as a determinant,
how culture, beliefs, methods of acquisition, preparation and social
interaction impact on a global scale. Reading, research, and course study
focuses on food sources, discoveries and the evolution of sustainables
and their effects on the formation of tribes and communities, population
growth and expansion. Dishes. history and commonalities from three
global cuisines will be compared, prepared and discussed. This is a
writing intensive course. Classes are divided between lecture and cooking
labs.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

CULA 410 Culture and Gastronomy II 3.0 Credits
The second of two courses devoted to the study of food and culture.
The course comprises a survey of contemporary food studies topics
and an examination of food choices in contemporary society. Reading,
research and course study focuses on food sources, individual and
gender identity, the global food chain, sustainability, inherent "costs" of
contemporary consumables, and the future of food in an ever expanding
global economy. Classes are divided between lecture and cooking labs.
This is a reading and writing intensive course.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 405 [Min Grade: D]

CULA 412 Food Writing 3.0 Credits
A practical introduction to food journalism. Explores through regular
writing and reading assignments the broad range of topics typically
encountered in a newspaper or magazine environment, from ingredient
features and trend stories, to profiles, first person essays, restaurant
criticism, "live" deadline assignments, and long-form magazine projects.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

CULA 415 Food Styling and Photography 3.0 Credits
The course deals with the basics of composition, color theory, basic digital
photography, food styling techniques, and what constitutes a professional
photographic image. An art historical approach is used to facilitate the
development of aesthetic judgment. Students prepare a variety of dishes,
utilizing and amplifying cooking skills, prop, style, and photograph a
variety of themed food and drink employing new skills in a new and
exciting manner.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 115 [Min Grade: D] or CULA 120 [Min Grade: D]

CULA 420 Senior Design Project 3.0 Credits
Students will undertake individual creative research which will enable
them to prepare for the Culinary Arts Program annual show. Emphasis
will be on the incorporation of skills, technologies and techniques learned
from prior coursework and experience.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: CULA 310 [Min Grade: D] and CULA 315 [Min Grade: D]

CULA 421 Senior Design Project I 2.0 Credits
Students will undertake individual creative research which will enable
them to prepare for the Culinary Arts Program annual show. Emphasis
will be on the incorporation of skills, technologies and techniques learned
from prior coursework and experience.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

CULA 422 Senior Design Project II 2.0 Credits
Students will undertake individual creative research which will enable
them to prepare for the Culinary Arts Program annual show. Emphasis
will be on the incorporation of skills, technologies and techniques learned
from prior coursework and experience.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 421 [Min Grade: D]

CULA 423 Senior Design Project III 2.0 Credits
Students will undertake individual creative research which will enable
them to prepare for the Culinary Arts Program annual show. Emphasis
will be on the incorporation of skills, technologies and techniques learned
from prior coursework and experience.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CULA 421 [Min Grade: D] and CULA 422 [Min Grade: D]

CULA 425 The Kitchen Garden 3.0 Credits
This course familiarizes students with the preparation and planting of
a raised-bed culinary garden using organic techniques. Students will
practice indoor and outdoor seed sowing; learn to promote soil health
and study the relationships between the kitchen and the garden. The
harvested spring produce is used for various culinary applications.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

CULA 426 The Kitchen Garden: Summer 3.0 Credits
This course familiarizes students with the dynamics of the contemporary
kitchen garden as a food source, and a platform for environmental
stewardship. Students will study the importance of plant nutrition; and
take part in community garden outreach activities. The harvested summer
produce is used in summer term Culinary Arts classes.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

CULA 427 The Kitchen Garden: Fall 3.0 Credits
This course familiarizes students with the complex relationships between
food sources, conventional vs. sustainable farming practices; and the
ethics of food access and waste analysis. Preservation of the harvest is
explored; and the fall produce is used in various culinary applications.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

CULA 440 Food in the Arts 3.0 Credits
Course offerings rotate: food in film, in literature, and painting. Film:
Examines the role that food plays in a film's story line, lives of the
characters, and how food is an element of expression and a transforming
agent. Students will study and discuss the films and recreate dishes from
each film. Literature: Food as a central theme in fiction, the role that food
plays in the story, the lives of the characters, and how it functions as an
element of expression and as a transforming agent. Students recreate the
dishes from each literary work, heighten their culinary skills and explore
the intricacies of the related cuisines. Painting: studies the role of food
in paintings 17th to the 21st C. from Caravaggio to Dali to Theibaud and
prepare meals inspired by them.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 2 times for 9 credits
Prerequisites: CULA 121 [Min Grade: D]

CULA I199 Independent Study in CULA 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

CULA I299 Independent Study in CULA 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

CULA I399 Independent Study in CULA 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if major is CULA.

CULA I499 Independent Study in CULA 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

CULA T180 Special Topics in CULA 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

CULA T280 Special topics in CULA 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

CULA T380 Special topics in CULA 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

CULA T480 Special topics in CULA 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if major is CULA.

Custom-Designed Major

Courses

CSDN 101 [WI] Introduction to Multi-Disciplinary Methods 1.0 Credit
Teaches Custom-Designed Major students about the many different
methods of scholarly analysis practiced across the university. Students
will be introduced to the methods practiced in the social sciences and
humanities, creative arts, science and engineering, and business.
College/Department: Pennoni Honors College
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CSDN.
Prerequisites: HNRS 200 [Min Grade: D]

CSDN 102 Knowledge by Design Seminar 1.0 Credit
Develops skills in designing curriculum paths at the University, designing
research topic bibliographies, and developing original research questions
and methodologies. The course culminates in the preparation of a formal
proposal for the student's course of study in the Custom-Designed Major
Program.
College/Department: Pennoni Honors College
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CSDN.
Prerequisites: CSDN 101 [Min Grade: D]

CSDN 203 Custom-Designed Major Seminar 1.0 Credit
Brings Custom-Designed Major students at the sophomore, pre-junior,
and junior years together to present and critique original work with their
peers related to their individualized courses of study.
College/Department: Pennoni Honors College
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CSDN and classification is
Sophomore.
Prerequisites: CSDN 102 [Min Grade: D]

CSDN 210 Methods of Interdisciplinary Inquiry 3.0 Credits
This seminar course will examine the role that varying methods of inquiry
play across disciplines and how those different methods can be applied
to problem solving. The intention is to expose students to a broad array
of research and problem solving methodologies, and to help them
synthesize these approaches in innovative ways to address real world
problems.
College/Department: Pennoni Honors College
Repeat Status: Not repeatable for credit

CSDN 220 Integrative Research Methods 3.0 Credits
This seminar course will help develop students' critical thinking and
research skills through the examination of interdisciplinary research
projects and the creation of their own research proposals. Students will
explore how multiple disciplinary research methodologies are integrated
and information is synthesized within and across interdisciplinary
research. The course is designed so that students gain familiarity with
the theory and application of interdisciplinary research. Students will
develop an understanding and the means to assess the various stages
of interdisciplinary research, including research question formulation,
proposal development, integration of methods, and synthesis and analysis
of information.
College/Department: Pennoni Honors College
Repeat Status: Not repeatable for credit

CSDN 304 Custom-Designed Major Proj I 3.0 Credits
Research project sequence for the Custom-Designed Major program.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated 2 times for 6 credits
Restrictions: Can enroll if classification is Senior.

CSDN 305 Custom-Designed Major Project II 3.0 Credits
Research project sequence for the Custom-Designed Major program.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated 2 times for 6 credits
Restrictions: Can enroll if classification is Senior.

CSDN 306 Custom-Designed Major Project III 3.0 Credits
Research project sequence for the Custom-Designed Major program.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated 2 times for 6 credits
Restrictions: Can enroll if classification is Senior.

CSDN I199 Independent Study in CSDN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit

CSDN I299 Independent Study in CSDN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit

CSDN I399 Independent Study in CSDN 1.0-3.0 Credit
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated 2 times for 6 credits

CSDN I499 Independent Study in CSDN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit

CSDN T180 Special Topics in CSDN 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit

CSDN T280 Special Topics in CSDN 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit

CSDN T380 Special Topics in CSDN 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit

CSDN T480 Special Topics in CSDN 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit

Dance

Courses

DANC 100 Survey of Dance Studies 3.0 Credits
This course will include lecture, reading assignments, writing assignments and self-reflection activities to introduce students to academic dance coursework in higher education.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DANC 101 Introduction to Dance Studies 3.0 Credits
This course will include lecture, reading assignments, writing assignments and self-reflection activities to introduce potential part-time professional dance program participants to coursework in higher education.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DANC 102 Yoga 3.0 Credits
The physical and intellectual study of the ancient practice of yoga. Includes both physical practice and readings related to the discipline, as well as a survey of a variety of forms of the practice.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 12 credits

DANC 104 Ballet Technique I 2.0 Credits
Introduces ballet dance vocabulary including alignment, stretching and strengthening, line, flexibility and movement phrases.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 7 times for 16 credits

DANC 105 Modern Dance Technique I 2.0 Credits
Introduces modern dance vocabulary, including stretching and strengthening exercises, alignment, movement phrases, and basic locomotor skills. Includes performances and discussion.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 7 times for 16 credits

DANC 106 Jazz Dance Technique I 2.0 Credits
Introduces jazz dance style, concentrating on body isolations, movement vocabulary and the development of movement phrases.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 8 credits

DANC 107 Hip-Hop Dance Technique I 2.0 Credits
Introduces hip-hop dance technique, vocabulary, movement principles, muscle control, and body alignment. Includes appreciation for funk and hip-hop with historical and cultural contexts.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 8 credits

DANC 108 Dance Improvisation I 2.0 Credits
A studio course in creative movement. Uses contact and structured improvisational problems, interaction between dances and the elements of time, space and force.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 8 credits

DANC 109 African Dance Technique I 2.0 Credits
This studio course is designed to explore the aesthetic, movement, music and rituals found in African Dance forms.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 8 credits

DANC 110 Movement for Actors 3.0 Credits
Employs specific exercises designed to increase the actor's ability to move freely and with expression and to appreciate the role of movement in the making of theater.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DANC 115 Introduction to Dance 3.0 Credits
A studio and classroom course. Examines the elements of dance through study and participation in classical, theatrical, and social forms. Includes readings, films, and discussion.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DANC 116 Dance and Fitness 3.0 Credits
This course explores areas of health and fitness that impact peak physical performance for dance and related activities. Topics will be covered through a combination of kinesthetic and academic approaches.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DANC 117 Foundations of Somatic Theory and Practice 3.0 Credits
This course, for beginner through advanced, teaches you to maximize your potential for dance, sports, yoga, martial arts or any movement practice, through readings, exercises and assignments that build core strength, flexibility and efficient action.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DANC 131 Dance Practicum in Performance 1.0 Credit
Provides practical experience as a dancer in a Department of Performing Arts dance production. Includes helping with preperformance production, attending all rehearsals, and performing in the concerts. May be repeated for credit.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DANC 132 Dance Practicum in Production 1.0 Credit
Provides practical experience in dance production, including participation in publicity, costume construction, lighting design, box office, and program production for a Drexel University Dance Ensemble concert. May be repeated for credit.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DANC 133 Dance Practicum in Choreography 1.0 Credit
Covers the process of developing an idea into a finished dance through close work with the artistic director, including selecting dancers and music; teaching the movement; planning costumes, lighting, and sets; polishing the work; and presenting it to an audience during a Drexel University Dance Ensemble concert. May be repeated for credit.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DANC 135 Rhythmic Study for Dance 3.0 Credits
Covers rhythmic structures that can accompany dance, including sight reading and eurhythmics.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DANC 204 Ballet Technique II 2.0 Credits
Studio course in intermediate level ballet technique. Further develops students' alignment, line, muscular stamina, flexibility, movement vocabulary and artistry. Prerequisite: Must have taken DANC 104 or DANC 140 two times.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 7 times for 16 credits
Prerequisites: DANC 104 [Min Grade: D] or DANC 140 [Min Grade: D]

DANC 205 Modern Dance Technique II 2.0 Credits
Covers advanced modern dance vocabulary including stretching and strengthening exercises, alignment, movement phrases and performance quality. Prerequisite: Must have taken DANC 105 or DANC 150 two times.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 7 times for 16 credits
Prerequisites: DANC 105 [Min Grade: D] or DANC 150 [Min Grade: D]

DANC 206 Jazz Dance Technique II 2.0 Credits
Covers advanced jazz dance style, concentrating on body isolations, movement vocabulary, and the development of movement phrases, syncopation and flexibility. Prerequisite: Must have taken DANC 106 or DANC 160 two times.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 8 credits
Prerequisites: DANC 106 [Min Grade: D] or DANC 160 [Min Grade: D]

DANC 207 Hip-Hop Dance Technique II 2.0 Credits
Advanced hip-hop dance technique, vocabulary, movement principles, muscle control, and body alignment. Includes appreciation for funk and hip-hop with historical and cultural contexts. Prerequisite: Must have taken DANC 107 or DANC 170 two times.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 8 credits
Prerequisites: DANC 107 [Min Grade: D] or DANC 170 [Min Grade: D]

DANC 208 Dance Improvisation II 2.0 Credits
A studio course in advanced creative movement. Uses improvisational problems and improvisational dance making to study momentum, speed, alignment, contact, sound, group work, and dramatic intention.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: DANC 108 [Min Grade: D] or DANC 180 [Min Grade: D]

DANC 209 African Dance Technique II 2.0 Credits
This studio course is an advanced exploration of the aesthetic, movement, music and rituals found in African Dance forms. It builds on principles of African I and introduces more complex and physically demanding repertory. Prerequisite: Must have taken DANC 109 or DANC 190 two times.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 8 credits
Prerequisites: DANC 109 [Min Grade: D] or DANC 190 [Min Grade: D]

DANC 215 Dance Appreciation 3.0 Credits
Teaches students to look at dance as an art form, emphasizing the ability to analyze and understand various dance styles. Includes films, readings, performances, and discussion. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DANC 216 Introduction to Laban Movement Analysis 3.0 Credits
This course introduces the principles of movement analysis by Rudolph Von Laban including an exploration of effort - shape, space and body as introduced by physical therapist Irmgard Bartenieff.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DANC 221 Survey of Dance and Movement Therapy 3.0 Credits
This course investigates the use of dance as a diagnostic and therapeutic tool for psychological health and recovery.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DANC 222 Dance Pedagogy 3.0 Credits
This course explores the social and physical development of children as it relates to the teaching of dance. Develops a repertoire of techniques for teaching children and adults.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DANC 225 Dance Repertory 2.0 Credits
This course allows dancers to synthesize their technical abilities with their knowledge of dance history as they learn the works of major historical choreographers.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 2 times for 6 credits

DANC 235 Dance Composition I 3.0 Credits
Explores the basic traditional forms of solo and group composition through improvisation, manipulation of movement phrases and critique.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DANC 260 Injury Prevention for Dance 3.0 Credits
This course uses physical and intellectual exploration to create individual flexibility and injury prevention plans that meet the student's goals. It is particularly targeted to dancers who use their bodies intensively. Techniques for injury prevention and recovery are emphasized.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DANC 304 Ballet Dance Technique III 2.0 Credits
Studio course in advanced level ballet technique. Further develops students' alignment, line, muscular stamina, flexibility, movement vocabulary, artistry and critical analysis of ballet movement. Prerequisite: Must have taken DANC 204 or DANC 141 three times.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 7 times for 16 credits
Prerequisites: DANC 204 [Min Grade: D] or DANC 141 [Min Grade: D]

DANC 305 Modern Dance Technique III 2.0 Credits
This course covers advanced modern dance vocabulary, including stretching and strengthening exercises, alignment principles, movement phrases and increasingly complex locomotor skills. Prerequisite: Must have taken DANC 205 or 151 three times.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 7 times for 16 credits
Prerequisites: DANC 205 [Min Grade: D] or DANC 151 [Min Grade: D]

DANC 306 Jazz Dance Technique III 2.0 Credits
This course covers advanced jazz dance styles for highly experienced students, concentrating on body isolations, movement vocabulary and the development of movement phrases, syncopation and flexibility. Prerequisite: Must have taken DANC 206 or 161 three times.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 8 credits
Prerequisites: DANC 206 [Min Grade: D] or DANC 161 [Min Grade: D]

DANC 315 Twentieth Century Dance 3.0 Credits
Covers the history of Western theatrical dance from the beginning of the century to contemporary times. Emphasizes the development of modern dance in the United States. Includes films, performances, and discussion. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DANC 316 Dance Kinesiology 3.0 Credits
This course will provide an introduction to the musculoskeletal system and basic health information. Students will gain an understanding of anatomy and kinesiology and will explore how these topics are related to dance, normal daily activities, injury prevention, and healthy lifestyle choices. The kinesiological concepts presented in this course will be applied using the context of dance movement.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DANC 335 Dance Composition II 3.0 Credits
This course explores the advanced forms of solo or group choreography including narrative, abstract and musical interactions.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 2 times for 9 credits
Prerequisites: DANC 235 [Min Grade: D] or DANC 240 [Min Grade: D]

DANC 415 Dance Aesthetics and Criticism 3.0 Credits
This course is designed to introduce students to the concepts of aesthetics which affect the ways in which dance in created, performed and viewed. Issues of dance criticism and how this pertains to aesthetic judgment will also be addressed. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: DANC 215 [Min Grade: D] or DANC 201 [Min Grade: D]

DANC 416 Survey of Somatic Practices 3.0 Credits
This course investigates a range of integrative mind/body practices for physical well-being and optimal performance.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (DANC 316 [Min Grade: D] or DANC 360 [Min Grade: D]) and (DANC 117 [Min Grade: D] or DANC 261 [Min Grade: D])

DANC 481 Senior Seminar in Dance 1.0 Credit
Senior Seminar prepares graduating Dance students for a successful transition after graduation and provide strategies to contribute to the field of dance. This course will also prepare students for a culminating senior project experience.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DANC 491 Senior Project in Dance 1.0 Credit
Senior Project is the capstone course for Dance Majors in which the student presents a project in one of three areas: a presentation, scholarly research paper, or a major performance. The students will be required to utilize the skills, techniques, and concepts that they learned prior to their senior year in Drexel's Dance Program and present a project that reflects the students' strength, concentration, and passion.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 2 times for 3 credits
Prerequisites: DANC 481 [Min Grade: D]

DANC 495 Directed Studies in Dance 0.5-12.0 Credits
Offers supervised individual study of special subjects in dance. May be repeated for credit. Department permission required.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DANC I199 Independent Study in DANC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DANC I299 Independent Study in DANC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DANC I399 Independent Study in DANC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DANC I499 Independent Study in DANC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DANC T180 Special Topics in Dance 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DANC T280 Special Topics in Dance 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.\.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DANC T380 Special Topics in Dance 0.5-3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DANC T480 Special Topics in Dance 0.5-3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Design & Merchandising

Courses

DSMR 100 Computer Imaging I 3.0 Credits
The course explores the fundamentals of computer design software
including Adobe Photoshop, Illustrator and InDesign. Projects include
graphics creation and manipulation; image acquisition, text creation and
manipulation; typography; input and output options and control; hardware/
software/system fundamentals; and troubleshooting as they relate to the
creative industries.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DSMR 103 Introduction to the Fashion Industry 3.0 Credits
Introduces the materials and methods used to design, develop, and
market the fashion product, including current vocabulary and foundation of
knowledge about industry practices and career opportunities.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DSMR 201 Analysis of Product 3.0 Credits
This course examines the methods by which non-apparel products are
conceived, designed and brought to market. Students learn to recognize
the importance of design integrity in the areas of home furnishing,
cosmetics, accessories, paper products, footwear, and industrial design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DSMR 205 Digital Promotion Strategies 3.0 Credits
Utilizing current and commonly available technologies, students develop
a communication plan to disseminate current trend and style information
to end use customers. Students explore past, analyze and participate
in the present and consider the future uses of new technologies in
merchandising fashion apparel, accessories and home products.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

**DSMR 210 Presentation Techniques Design and Merchandising 3.0
Credits**
This course explores the various types of presentation/storyboard formats
used within the industry in merchandising product. The student learns to
create an array of presentations used for visual communication among all
facets of the workplace as well as market research specific to the design
industry.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (VSST 102 [Min Grade: D] or VSST 105 [Min Grade: D])
and (VSCM 100 [Min Grade: D] or DSMR 100 [Min Grade: D] or WEST
100 [Min Grade: D]) and DSMR 211 [Min Grade: D] and COM 230 [Min
Grade: D]

**DSMR 211 Computer Design for Design and Merchandising 3.0
Credits**
This course addresses the use of computer design as a merchandising
and design tool for branding and promotion of a business or organization.
The student is introduced to the branding process from a visual point of
view and will create brand identity materials through the use of computer
software programs including Adobe Photoshop, Illustrator and InDesign.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSCM 100 [Min Grade: D] or DSMR 100 [Min Grade: D] or
WEST 100 [Min Grade: D]

**DSMR 212 Visualization Techniques for Design & Merchandising 3.0
Credits**
Visual Presentation for Design and Merchandising explores hand drawn
and 3D computer software tools to accurately express design intentions
for store and window displays, branded fixture plans as well as other
design related projects. This course focuses on analog and digital
techniques including diagrammatic sketching, 1-point perspective, visual
note-taking and mind-mapping skills, hand coloring techniques, concept
boards and SketchUp.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: VSST 111 [Min Grade: D]

DSMR 230 Textiles for Design and Merchandising 3.0 Credits
Examines the textile manufacturing industry and the fundamental processes involved in producing natural and man-made fabrics as they relate to Design & Merchandising. Includes basic terminology and production processes as well as selection and evaluation of fabrics based on aesthetics, performance and care characteristics.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is DSMR.

DSMR 231 Retail Operations 3.0 Credits
Examines retail philosophies within an operational context, including understanding how consumption, present and future, determines a retailer's strategy.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

DSMR 232 Merchandise Planning and Buying 4.0 Credits
Provides a working knowledge of merchandise planning, flow, and distribution in the retail setting. Covers profitable merchandise and assortment planning and control in both conceptual and technical formats. Final project incorporates six-month financial, classification, and assortment planning.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (ACCT 115 [Min Grade: D] or ECON 201 [Min Grade: D] or ACCT 110 [Min Grade: D]) and DSMR 231 [Min Grade: D]

DSMR 233 [WI] Retail Image Analysis 3.0 Credits
Students will perform an in-depth analysis of theoretical and applied retail product and brand research. Qualitative, quantitative and triangulation methods of research will be discussed. The course focuses on researching, writing and presenting various topics in a professional environment. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DSMR 305 Digital Commerce 3.0 Credits
Students explore and analyze past, current and future trends in ecommerce technologies that primarily support the back end inventory, logistics and front end operations of the fashion apparel, accessory and home products industries.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

DSMR 309 Color and Trend Forecasting 3.0 Credits
This course provides an overview of the fashion forecasting function in Fashion, Design & Merchandising. Students investigate color and trend forecasting, design research and concepts, and fabric direction. Students apply their knowledge in "hands on" color cards and development of a trend book.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: DSMR 210 [Min Grade: D] or FASH 310 [Min Grade: D]

DSMR 310 Merchandising Operations & Management 3.0 Credits
This course will focus on the Apparel Management functions that exist between the merchandising, design, production and promotion elements of the apparel supply chain. The student will be a member of a team that must bring a fully merchandised collection from item selection through production to retail in an ideal Vertical Merchandising System. Forecasting, collection development, production and revisions, allocation of inventory, coordinated visual presentation packaging and problem solving of anomalies in the supply chain are integrated into this course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: DSMR 211 [Min Grade: D] and DSMR 232 [Min Grade: D]

DSMR 311 Visual Merchandising 4.0 Credits
Visual Merchandising combines design skills, consumer psychology and marketing principles to create window displays, floor merchandising and plan-o-grams in a retail environment that entices consumers to buy. Students will investigate related areas of store planning and design, point-of-purchase display, fixture design, and topics on trend in the industry. Students will apply the principles and elements of design in merchandise presentation, analysis and experimentation and field research. Methods of promoting and selling merchandise, analyzing leading retail firms, employing basic methods of displaying merchandise, and developing a basic understanding of the use of special materials and lighting will be integrated into experiential projects outside of the classroom.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (VSST 103 [Min Grade: D] or VSST 106 [Min Grade: D]) and DSMR 211 [Min Grade: D] and DSMR 310 [Min Grade: D]

DSMR 312 Visual Merchandising II 3.0 Credits
Visual merchandising II is an in-depth look at exhibit design, where students explore the traditions, expectations and norms of exhibit design. Technological advances in exhibit design will be introduces and utilized to produce a visual outcome/presentation for exhibition purpose.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (VSST 103 [Min Grade: D] or VSST 106 [Min Grade: D]) and DSMR 210 [Min Grade: D] and DSMR 211 [Min Grade: D]

DSMR 313 International Fashion Merchandising 3.0 Credits
Introduces students already familiar with U.S. retail merchandising to global retail merchandising. Develops a framework for the international merchandising process and discusses effects of globalization.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: DSMR 231 [Min Grade: D]

DSMR 314 Visual Merchandising III 4.0 Credits
Assuming the role of the Visual Merchandiser students apply Visual Merchandising principles to the area of store planning and design, analyze leading retailers and trends, develop an understanding of the use of materials and lighting "in store," and learn to use industry software. This course is inter-disciplinary with Interior Design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is DSMR or major is INTR and classification is Junior or Senior.
Prerequisites: DSMR 311 [Min Grade: D]

DSMR 315 [WI] Media Merchandising I 3.0 Credits
Media Merchandising I explores the process of creating, designing and publishing the annual D & M Magazine and accompanying media. The students develop all content organized around theses of school, city, fashion, product and technology, their various intersections as it relates to design and merchandising. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 1 times for 6 credits
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: VSST 103 [Min Grade: D] and DSMR 210 [Min Grade: D] and DSMR 211 [Min Grade: D] and ENGL 103 [Min Grade: D]

DSMR 316 Media Merchandising II 3.0 Credits
Media Merchandising II is a continuation of Media Merchandising I, where critical decisions with regard to informational articles, interviews, photography, graphic design, interactive media and paid advertisement are completed. The end result is the D & M Magazine, a distributable product with actual marketing potential.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 1 times for 6 credits
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: DSMR 315 [Min Grade: D]

DSMR 320 Merchandising and Design Directions 3.0 Credits
Merchandising and Design Directions addresses the production of prototypes for a small collection of accessories or home products. The necessary collateral promotional materials for marketing these designs to a specific target market and retail outlet will also be created.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 1 times for 6 credits
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: VSST 103 [Min Grade: D] and DSMR 210 [Min Grade: D] and DSMR 211 [Min Grade: D]

DSMR 321 [WI] Fashion Show Production I 2.0 Credits
Limited enrollment. This course is an examination of the Fashion Show as a sales and marketing tool and as a historically important event in the evolution of the fashion industry. An understanding of all behind-the-scenes aspects of a professional fashion show will be discussed. This course introduces a hands-on experience in addition to academic course work. Especially for students interested in event planning, public relations and marketing, this course provides experience that will be valuable as students enter the workplace.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

DSMR 322 Fashion Show Production II 2.0 Credits
DSMR 322, Fashion Show Production II, is a continuation of DSMR 321. Whereas DSMR 321 examined the business of the fashion show using an academic approach (lecture, projects, video), DSMR 322 is a hands-on experience, which culminates in the production of Drexel's annual fashion show each year in June. The purpose of the course is to give students experience producing one of the College and University's most important public relations events. Students are an integral part of the team that plans, manages and executes all phases of the Fashion Show.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: DSMR 321 [Min Grade: D]

DSMR 324 Retail Intersections: Social & Cultural Issues 3.0 Credits
Those who participate in the business of fashion such as retailers, merchants, designers, manufacturers and stylists must evolve in order to sell to customers. Throughout their lives, students are exposed to retailing, merchandising, buying, design, sales, branding, promotions, manufacturing and other such fields. For those interested in the study of retailing, fashion and merchandising, it is essential to understand landmark research and theoretical concepts behind the influences of this field and how social change, innovations and with the evolution of a multicultural marketplace, shifts have occurred over generations, and into the 21st century. This conceptual and theoretical course will expose students to a diverse range of clients and consumers.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: DSMR 231 [Min Grade: D]

DSMR 325 Advanced Merchandise Planning and Buying 4.0 Credits
Advanced buying strategies focuses on in-season merchant operations of the merchant organization. Students develop assortment and promotional plans and learn to react to changes in their plans as the season unfolds. Students perform "hands on" tasks in conjunction with the D & M retail outlets.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: DSMR 232 [Min Grade: D]

DSMR 326 Fashion Product Promotion 4.0 Credits
This course explores the global aspects of product promotional strategies through the examination of the economic, political and social/cultural trends of today's globalized marketplace. Various national and international regions are analyzed in terms of their market characteristics and current retail environment. Students will research market information and analyze opportunities regarding merchandise positioning and brand imagery toward the development of a comprehensive promotional plan.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 1 times for 8 credits

DSMR 333 Fashion Product Development 3.0 Credits
Provides an overview of both knitted and woven apparel. Covers the procedures and processes involved in apparel product development, particularly as related to retail merchandising and marketing. Considers styling as a reflection and a reinterpretation of current trends in specific markets.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FASH 201 [Min Grade: D] or DSMR 103 [Min Grade: D]

DSMR 397 Retail Practicum 3.0 Credits
Students work on a variety of hands on projects surrounding our retail laboratory, supporting the d&m popup and online retail outlets. Tasks may include: Product development, buying, visual merchandising, photography, operations, data collection, analysis and promotion.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 4 times for 15 credits

DSMR 398 D&M Practicum 0.5-4.0 Credits
Students work on a variety of special projects for ongoing D&M Program administration and special project requests from Industry and Community Partners that vary each term. The Industry and Community Partners and the D&M program are seen as clients, and these special projects are integral to their business. Examples include: developing content for the D&M program Social Media, developing and implementing mannequin display throughout the D&M program space, providing event planning support for community or industry partner events.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 10 times for 44 credits

DSMR 410 Career Strategies for Design and Merchandising 3.0 Credits
Course develops skills that enable the student to put into place an effective job search strategy. Specifically geared to the D&M professions, students develop comprehensive area of expertise including networking, industry research, and industry hiring trends.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.

DSMR 411 Design and Merchandising Portfolio Design 3.0 Credits
Students will prepare a complete visual showcase of their marketability and skills. Accepted industry standards, targeting visual elements to specific job goals and self-promotion will be emphasized.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DSMR 454 Sourcing Strategies for Textile and Apparel 4.0 Credits
This course will cover solutions to evaluate, create, and improve fashion supply chain operations based on a triple bottom line business model with the goal of promoting environmental, social, and economic sustainability. The student will utilize ERP and PLM software that integrates internal and external management information across an entire organization.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: DSMR 230 [Min Grade: D] and DSMR 333 [Min Grade: D]

DSMR 464 Merchandising Analytics 4.0 Credits
An integral part of today's retail environment is data analytics. This real-world data-driven course highlights a variety of critical retail metrics and analyses that will demonstrate and support the importance of being a data-driven decision-making business. The course will utilize technology to enhance the understanding of the use of data to make key business decisions in retail buying and planning.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: DSMR 310 [Min Grade: D]

DSMR 477 [WI] Design and Merchandising Seminar 3.0 Credits
Provides reading and discussion of pertinent topics of current concern in the professional area of design and merchandising. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is DSMR.
Cannot enroll if classification is Freshman

DSMR 496 [WI] Senior Problem in Design and Merchandising 3.0 Credits
Provides an opportunity for the student to research, independently or within a group, an idea within the field of design-merchandising, synthesizing material and developing a presentation of that concept. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

DSMR I199 Independent Study in Design & Merchandising 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DSMR I299 Independent Study in Design & Merchandising 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DSMR I399 Independent Study in Design & Merchandising 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DSMR I499 Independent Study in Design & Merchandising 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DSMR T180 Special Topics in Design & Merchandising 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DSMR T280 Special Topics in Design & Merchandising 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DSMR T380 Special Topics in Design & Merchandising 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DSMR T480 Special Topics in Design & Merchandising 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Digital Media

Courses

DIGM 100 Digital Design Tools 3.0 Credits
Students learn the basics of visual design within the digital realm. Software tools such as Adobe Photoshop and Illustrator are utilized.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DIGM 105 Overview of Digital Media 3.0 Credits
Surveys the history, theory, practice, technologies, and related social issues associated with the growth of digital media.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DIGM 110 Digital Spatial Visualization 3.0 Credits
Students learn to represent 3D objects and spaces in 2D media using a variety of drawing and computer graphic techniques. This course lays important foundations for subsequent courses in 3D computer modeling and animation.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (DIGM 100 [Min Grade: D] or GMAP 101 [Min Grade: D]) and VSST 110 [Min Grade: D]

DIGM 220 Digital Still Imaging I 3.0 Credits
Introduces the still image for majors in screen-based visual media. Covers the making, appreciation, and critical analysis of images produced by still cameras using both film and digital capture. Screen-based presentation is primary, but a number of print-based projects are included.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (DIGM 100 [Min Grade: D] or GMAP 101 [Min Grade: D]) and (VSST 101 [Min Grade: D] or VSST 108 [Min Grade: D])

DIGM 223 Creative Concept Design 3.0 Credits
This course explores methods to develop design concepts on demand. Topics to be considered include recognizing one's imaginative potential, expanding fanciful memory, and maintaining a creative ecology of mind.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DIGM 250 Professional Practices 3.0 Credits
Provides a professional orientation to the field through an exploration of a variety of digital media projects. In addition to lecture and discussions, allows students to take active part in role plays and presentations to achieve an understanding of the importance of team building, team work, and team management in all phases of digital media production from proposals to product delivery.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

DIGM 252 Multimedia Timeline Design 3.0 Credits
Introduces basic design concepts and tools to create time based 2D and 3D multimedia. Addresses issues from pre-production planning, through, post-production and delivery; emphasis on time-based multimedia.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: DIGM 100 [Min Grade: D]

DIGM 308 [WI] Digital Cultural Heritage 3.0 Credits
Digital Cultural Heritage is a growing pursuit including Digital Media, Digital Humanities, Computer Science, and Archeology. It has components in academic research, museology, tourism, economic development as well as new media technology development and applications. This class will investigate this emerging and exciting field and explore its possibilities in the context of Philadelphia's cultural heritage.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

DIGM 350 [WI] Digital Storytelling 3.0 Credits
By surfing the internet and playing computer games, by lectures, assigned readings, class screening, and research projects, this class explores the impact of digital media on art, design and daily living. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

DIGM 355 Overview of Immersive Media 3.0 Credits
Provides a broad overview and introduction to Immersive media in all its forms including narrative (video and animation) and interactactive (game engine, user roams free and interacts/changes what they see). In addition to these two broad categories, this course also covers many of the commonly used delivery methods for these experiences including head-set VR, head-set AR, mobile screen AR, fulldome projection.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ANIM 211 [Min Grade: D]

DIGM 359 Immersive Media Production & Post 3.0 Credits
This course introduces production and post-poduction of narrative immersive media such as 360° photos and video (monoscopic and stereoscopic), as well as CGI animated works. Production involves the use of cameras and lighting to capture the real world, or CGI animation to create imagined worlds. Viewers of this type of media "experience" stories unfolding all around them within headsets or in fulldome projection, but are not able to change or move through the environment the way a video game player would inside a video game.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: DIGM 355 [Min Grade: D]

DIGM 365 Interactive Immersive Media 3.0 Credits
This course introduces immersive media experiences that are fully interactive, allowing the viewer/user to manipulate and navigate through the experience rather than view it passively. Rather than using camera or rendered animation, this form of immersive media is created using interactive game engines like Unity or Unreal, but can also involve custom code development similar to interactive digital media such as web and mobile applications.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: DIGM 355 [Min Grade: D]

DIGM 399 Independent Project-Digital Media 2.0-12.0 Credits
Supervised planning and execution of a project in the area of digital media. Department permission required.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

DIGM 451 [WI] Explorations in New Media 3.0 Credits
Through class presentations, field trips, discussions, readings, screenings and guest speakers; this class bridges artistic and technical aspects of new media in theory and practice. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

DIGM 475 [WI] Seminar: The Future of Digital Media 3.0 Credits
Focuses on current and anticipated issues in digital media. Involves reading and discussion of news, product announcements, articles, and predictions related to digital media. Provides a comprehensive and up-to-date understanding of digital media, including its likely directions in the immediate future and long-term possibilities. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 371 [Min Grade: D] (Can be taken Concurrently)DIGM 451 [Min Grade: D]

DIGM 490 Digital Media Senior Project 3.0 Credits
In this course students produce professional-level media assets for a team based senior project in a simulated real-world production environment. It requires a project that demonstrates the integration of the academic and practical knowledge the student has acquired in the overall field as well as in one or more specializations. Students will refine their understanding of the production, delivery and presentation of quality digital media production through implementation of professional best practices, and practice and perfect written, oral, and visual presentation skills through the power of collaboration, teamwork and shared missions.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 2 times for 9 credits
Prerequisites: (ANIM 314 [Min Grade: D] or GMAP 377 [Min Grade: D] or IDM 372 [Min Grade: D] or VRIM 320 [Min Grade: D]) and DIGM 451 [Min Grade: D]

DIGM 491 Digital Media Senior Project Studio 1.0 Credit
In this course Digital Media senior project teams will meet with an appointed advisor on the technical details of their specific project requirements.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 2 times for 3 credits

DIGM 492 Senior Project in Digital Media I 3.0 Credits
The first of a two-course sequence. Requires a project that demonstrates the integration of the academic and practical knowledge the student has acquired in the overall field as well as in one or more specializations.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.

DIGM 493 Senior Project in Digital Media II 3.0 Credits
The second of a two-course sequence.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is DIGM and classification is Senior.
Prerequisites: DIGM 492 [Min Grade: D]

DIGM 494 Senior Project in Digital Media III 3.0 Credits
The third of a three-course sequence. Requires a project that demonstrates the integration of the academic and pratical knowledge the student has acquired in the over all field as well as in one or more specializations.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is DIGM and classification is Senior.
Prerequisites: DIGM 493 [Min Grade: D]

DIGM I199 Independent Study in Digital Media 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DIGM I299 Independent Study in Digital Media 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DIGM I399 Independent Study in Digital Media 2.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DIGM I499 Independent Study in Digital Media 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DIGM T180 Special Topics in Digital Media 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DIGM T280 Special Topics in Digital Media 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DIGM T380 Special Topics in Digital Media 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

DIGM T480 Special Topics in Digital Media 0.0-3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Economics

Courses

ECON 201 Principles of Microeconomics 4.0 Credits
Examines allocation of resources within an economy. Major topics include interaction of supply and demand in markets, consumer choice, cost structure of firms, and profit maximization for competitive forms as well as firms with market power.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

ECON 202 Principles of Macroeconomics 4.0 Credits
Examines measurement, growth, and fluctuation of aggregate economic activity. Includes national income accounting and explains determination of output, employment, and price level. Also provides an introduction to international economics, money and banking, and economic policy. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: ECON 201 [Min Grade: D] (Can be taken Concurrently)

ECON 203 [WI] Survey of Economic Policy 4.0 Credits
This course will introduce students to the application of economic principles for a variety of policy-relevant topics covered in more advanced economics classes. Examples of applications may include the analysis of financial and economic crises, mergers, free trade agreements, social security, and unemployment.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: ECON 202 [Min Grade: D] (Can be taken Concurrently)ECON 201 [Min Grade: D]

ECON 240 Economics of Health Care Systems 4.0 Credits
Examine the health care industry from an economic perspective, including demand, cost-benefit analysis, insurance, supply constraints, and the role of the government.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

ECON 250 Game Theory and Applications 4.0 Credits
Introduces the basic ideas of game theory with a minimum of mathematics; and discuses application to economics, politics, business, behavioral science, philosophy, population biology and engineering.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Freshman.
Prerequisites: STAT 201 [Min Grade: C] or STAT 205 [Min Grade: C] or MATH 107 [Min Grade: C] or MATH 310 [Min Grade: C] or MATH 311 [Min Grade: C]

ECON 260 Economics of Small Business 4.0 Credits
Discusses economic topics relevant to the role and varieties of small businesses in industrialized economies, and to government policy with respect to small business.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: ECON 201 [Min Grade: C]

ECON 301 Microeconomics 4.0 Credits
Examines theory of the firm and theory of the consumer in a rigorous fashion. Also covers risk and uncertainty, price determination, market failures, and analysis of various government policies.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECON 201 [Min Grade: C] and ECON 202 [Min Grade: C] and (MATH 102 [Min Grade: C] or MATH 121 [Min Grade: C])

ECON 321 Macroeconomics 4.0 Credits
Provides an in-depth introduction to dominant theories behind short-run economic fluctuations and long-run economic growth. Employs both mathematical and graphical tools to discuss determination of output, employment, and price level in the aggregate economy. Also covers effectiveness of monetary and fiscal policies in dealing with unemployment and inflation.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECON 201 [Min Grade: C] and ECON 202 [Min Grade: C] and ECON 301 [Min Grade: C] and (MATH 102 [Min Grade: C] or MATH 121 [Min Grade: C])

ECON 322 [WI] Economics Seminar 4.0 Credits
Requires research and writing of a scholarly paper on a topic in economics approved by an appointed faculty adviser. This is a writing intensive course.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECON 301 [Min Grade: C] and ECON 321 [Min Grade: C]

ECON 326 [WI] Economic Ideas 4.0 Credits
Covers the history of economic thought and development of different schools of thinking in economics. This is a writing intensive course.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECON 201 [Min Grade: C] and ECON 202 [Min Grade: C]

ECON 330 Managerial Economics 4.0 Credits
Covers applied economics relevant for decision-making processes. Emphasizes profit management, demand and cost analysis, pricing, and government policy.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECON 201 [Min Grade: C] and ECON 202 [Min Grade: C]

ECON 331 International Macroeconomics 4.0 Credits
This course covers fundamental issues in open economy macroeconomics. We will learn about how fiscal and monetary policy work when the economy is open to international trade in goods and services and to international capital flows. We will also study the effects of these policies on the current account and the exchange rate. The course treatment will be mainly theoretical. However, we will frequently refer to features of the international financial markets data, and we will use examples, case studies, readings, videos and policy applications to illustrate the findings of the theory and/or to try to bridge the gap between the predictions of theoretical models and real world developments.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: ECON 201 [Min Grade: C] and ECON 202 [Min Grade: C]

ECON 334 Public Finance 4.0 Credits
This course explores the role of government in the economy. Students will analyze the rationales for government policies as well as their implications for equity and efficiency. Much of the course will center on current policy issues related to the national debt, Social Security, education, environmental protection and taxation. Both theoretical applications and empirical findings will be discussed.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: ECON 201 [Min Grade: C] and ECON 202 [Min Grade: C] and (MATH 102 [Min Grade: C] or MATH 121 [Min Grade: C])

ECON 336 Labor Economics 4.0 Credits
Develops an understanding of how labor institutions operate to determine wages and employment. Examines alternative policy questions involving unemployment and inflation, collective bargaining, investment in education and training, and other labor-related questions. Requires students to apply theoretical and empirical abilities to research a labor-related issue and improve the ability to think clearly and communicate effectively.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECON 201 [Min Grade: C] and ECON 202 [Min Grade: C]

ECON 338 Industrial Organization 4.0 Credits
Examines observational studies of industries with respect to competitive or non-competitive structure, conduct, and performance. Considers implications of profitability, technological innovation, antitrust policy, and competitiveness in trade. Reviews problems of measurement and sources of data.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECON 201 [Min Grade: C] and ECON 202 [Min Grade: C] and (MATH 102 [Min Grade: C] or MATH 121 [Min Grade: C])

ECON 342 Economic Development 4.0 Credits
Covers topics including driving forces of economic growth, economic planning, income distribution and poverty, labor migration, capital markets and saving, international debt problems and global economic crisis. Emphasizes underlying theories and realities of economic growth and development of less developed economies and emerging economies.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECON 201 [Min Grade: C] and ECON 202 [Min Grade: C]

ECON 344 Comparative Economic Systems 4.0 Credits
Covers theory and contemporary practices of capitalism, socialism, fascism, and the welfare state as economic systems.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECON 201 [Min Grade: C] and ECON 202 [Min Grade: C]

ECON 348 Mathematical Economics 4.0 Credits
Discusses the application of mathematics in economic models, with extensive discussion of economic applications of linear algebra and calculus. Considers implications of the assumptions of maximization of profits and utility. Stresses mathematical models and techniques useful in statistical applications of economics.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECON 201 [Min Grade: C] and ECON 202 [Min Grade: C] and (MATH 102 [Min Grade: C] or MATH 121 [Min Grade: C])

ECON 350 [WI] Applied Econometrics 4.0 Credits
Applies statistics to economics, with emphasis on the special problems of statistical analysis of economic data, sources of data, and examples of applications and models. Covers forecasting the impacts of changing economic policy and of developments in industrial markets using economic-statistical models. This is a writing intensive course.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECON 201 [Min Grade: C] and ECON 202 [Min Grade: C] and STAT 201 [Min Grade: C]

ECON 351 Resource and Environmental Economics 4.0 Credits
Examines the microeconomic and quantitative aspects of markets for both renewable and exhaustible resources, and the interaction between the energy and resource sectors of the economy and between the productive sectors of the economy and the natural environment, with evaluation of major public policy initiatives and issues in these areas.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECON 201 [Min Grade: C] and ECON 202 [Min Grade: C]

ECON 354 Money and Banking 4.0 Credits
This is a course about the role of money and financial intermediation in modern economies and therefore the environment in which businesses operate. The course is organized around three sets of questions. First, what is money and why is it necessary? How can seemingly worthless paper serve a key purpose in a market economy? Second, what is the role of banks, both historically and in the more complex financial system of today? What are the origins of banking panics such as those experienced at the onset of the Great Depression or during the 2007-08 financial crisis? Third, how do central banks conduct monetary policy and what types of policies should the Federal Reserve and other government agencies follow to prevent financial crises?.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: ECON 321 [Min Grade: C] or FIN 325 [Min Grade: C]

ECON 360 Time Series Econometrics 4.0 Credits
Introduce time-series econometric models and provide tools for empirical analysis using time-series economic and financial data, with specific emphasis on application and forecasting.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: ECON 201 [Min Grade: D] and ECON 202 [Min Grade: D] and ECON 350 [Min Grade: D]

ECON 361 Health Economics 4.0 Credits
This course covers the economics of health and health care. Students will study how health is produced, how health insurance markets work, the government role in health care, cost benefit analysis, and the markets for medical education, pharmaceuticals and physician and hospital services. Students will learn to analyze health systems on grounds of efficiency and equity, and to assess the credibility of research in health economics and health policy. This course should be of interest to students who are interested in public policy issues surrounding health, health care, health in developing nations and health care reform.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: ECON 201 [Min Grade: C]

ECON 365 Behavioral Economics 4.0 Credits
This course provides a systematic introduction to behavioral economics, the field aimed at modeling and understanding how individuals make decisions based on psychological and experimental evidence. The course will introduce the main behavioral patterns underlying some of the most important areas of economic decision making. Examples include consumption and saving decisions, choice under risk, as well as social and strategic interactions. Students will also learn the models that try to explain these behaviors and their applications to policy making.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: ECON 201 [Min Grade: C]

ECON I199 Independent Study in ECON 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ECON I299 Independent Study in ECON 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ECON I399 Independent Study in ECON 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ECON I499 Independent Study in ECON 0.5-5.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ECON T180 Special Topics in ECON 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ECON T280 Special Topics in ECON 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ECON T380 Special Topics in ECON 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ECON T480 Special Topics in ECON 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

Education Human Resource Development

Courses

EHRD 205 Organizational Learning & Strategy 3.0 Credits
The purpose of this course is to help learning professionals understand how to align learning functions with strategic goals of the organization in order to support leadership functions. Students will develop an understanding of learning in, by, and across organizations, explore barriers to change, and discuss and apply specific tools and processes to facilitate and sustain change and tighten the alignment of organizational learning and strategy.
College/Department: School of Education
Repeat Status: Not repeatable for credit

Education Learning Technologies

Courses

EDLT 101 Learning, Culture & Technology Workshop I 3.0 Credits
The Workshops (EDLT 101, 201, 301) are comprised of a set of three project-based courses that will provide innovative, rigorous, and immersive educational experiences in diverse learning environments that focus on emerging technologies, authentic and situated learning and contextual factors. Students will observe, document, analyze, and describe complex learning situations, develop different learning designs, and an e-portfolio, and explore social and cultural perspectives on learning.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDLT 103 Foundation in Education III: Learning Sciences 3.0 Credits
This foundations course introduces students to the Learning Sciences, an interdisciplinary field that draws on multiple theoretical perspectives and research paradigms with the goal of advancing and applying knowledge about human learning and development. Its purpose is to introduce students to basic concepts and findings relevant to theory, design, and research in the Learning Sciences, with specific focus on how those concepts and findings apply to learning environments and experiences. Students will learn the rich history about learning and acquire a deep understanding of how the notion of learning has evolved over time. Students will collaborate to design learning environments from different theoretical perspectives on learning.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDLT 201 Learning, Culture and Technology Workshop II 3.0 Credits
The Workshops (EDLT 101, 201, 301) are comprised of a set of three project-based courses that will provide innovative, rigorous, and immersive educational experiences in diverse learning environments that focus on emerging technologies, authentic and situated learning and contextual factors. Students will observe, document, analyze, and describe complex learning situations, develop different learning designs, and an e-portfolio, and explore social and cultural perspectives on learning.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDLT 238 New Media Literacies 3.0 Credits
This course provides an in-depth exploration of new media literacies including the practices and concepts of fan fiction writing, online social networking, video gaming, appropriation and remixing, tinkering and making, transmedia navigation, multitasking, performance, distributed cognition, and collective intelligence. It examines literacy as a sophisticated set of meaning-making activities situated in specific social spaces. Students will learn how new media are changing the dimensions of school literacies and challenge traditional ways of learning and communicating.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDLT 250 Sociocultural Perspectives on Learning 3.0 Credits
This course will focus on knowing and learning from sociocultural perspectives and will include emphasis on both recent research and seminal literature. The course will begin with an introduction to sociocultural research and then explore how these theories can be used to understand how learning occurs in various disciplines.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDLT 301 Learning, Culture & Technology Workshop III 3.0 Credits
The Workshops (EDLT 101, 201, 301) are comprised of a set of three project-based courses that will provide innovative, rigorous, and immersive educational experiences in diverse learning environments that focus on emerging technologies, authentic and situated learning and contextual factors. Students will observe, document, analyze, and describe complex learning situations, develop different learning designs, and an e-portfolio, and explore social and cultural perspectives on learning.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDLT 325 Design for Learning with Digital Media 3.0 Credits
Investigates the relationship among learning sciences, theory, technology, and design in the creation of learning goals and experiences. Special emphasis is placed on the integration of technology in order to enhance effective learning. Learners will design learning activities, create them, implement them, and assess their effectiveness with digital tools. Issues in digital citizenship, collaboration, affordability, and continuous learning will also be examined.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDLT 326 Technology Applications for Learning 3.0 Credits
Investigates the application of digital technologies as learning tools from the perspectives of design, development, implementation, and assessment. Provides learners with an understanding of the instructional versatility and limitations of digital technologies through hands-on experience with applications in their subject-matter fields. Addresses issues concerning integrating digital technologies into a variety of formal and informal learning settings.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDLT 339 Future Pedagogies 3.0 Credits
This course introduces learners to learning and designing experiences for complex domains. Students explore current pedagogies and how to assess the progress of learning. Students learn how to think about and design learning environments to facilitate different types of knowledge to support novice to expert learners.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDLT 353 Play and Learning in Participatory Cultures 3.0 Credits
In this course, students examine the role of play along the developmental continuum and in immersive and interactive learning spaces. Students also examine how play impacts learning in the context of participatory cultures. Students focus on play, its role in learning in social spaces, and the current research around these practices. Students study the issues relating to how schools, organizations, and society are responding to the challenges of emerging technologies through the design of participatory spaces.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDLT 354 Learning In and Out of Schools 3.0 Credits
The term "informal learning environments" (ILEs) is often used to describe places and activities where learning occurs outside of more formal settings such as schools, universities, etc. Examples of ILEs include after school activities, museums, zoos, and so on. This course is an introduction to ILEs and theories related to understanding how learning occurs within them. The course will also consider similarities and differences between learning in and out of schools.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDLT 491 Senior Project I 3.0 Credits
The Senior Project courses (EDLT 491, 492, 4933) are a set of three courses intended to immerse student teams in the design, implementation, and evaluation of a substantial project. Most educational design research involves teams in their creation, so it is essential to develop those skills. Students collaborate on an extended project to better understand project and time management issues related to large design projects. The courses also facilitate students' integrating materials from other courses in service of better learning environments.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDLT 492 Senior Project II 3.0 Credits
The Senior Project courses (EDLT 491, 492, 4933) are a set of three courses intended to immerse student teams in the design, implementation, and evaluation of a substantial project. Most educational design research involves teams in their creation, so it is essential to develop those skills. Students collaborate on an extended project to better understand project and time management issues related to large design projects. The courses also facilitate students' integrating materials from other courses in service of better learning environments.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDLT 491 [Min Grade: D]

EDLT 493 Senior Project III 3.0 Credits
The Senior Project courses (EDLT 491, 492, 4933) are a set of three courses intended to immerse student teams in the design, implementation, and evaluation of a substantial project. Most educational design research involves teams in their creation, so it is essential to develop those skills. Students collaborate on an extended project to better understand project and time management issues related to large design projects. The courses also facilitate students' integrating materials from other courses in service of better learning environments.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDLT 491 [Min Grade: D] and EDLT 492 [Min Grade: D]

Electrical & Computer Engineering

Courses

ECE 101 Electrical and Computer Engineering in the Real World 1.0 Credit
This seminar introduces students to highly visible and compelling applications of ECE through the use of familiar real-world applications. The course will highlight some of the high-impact advances of ECE and the importance of ECE in our daily lives. Fundamental concepts, such as electricity, light, computing, networking, and signal processing will be introduced in this context and explained at an introductory level. This course is intended to inspire students to pursue ECE and will lead them directly into ECE 102.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

ECE 102 Applications of Electrical and Computer Engineering 2.0 Credits
Introduces the basic fundamentals of ECE through the use of real-world applications. The course will introduce Signals and Systems, Analog electronic basics, as well as Digital numbers and systems. The course will introduce students to basic ECE material, preparing the students for ECE 200 and ECE 201.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

ECE 105 Programming for Engineers II 3.0 Credits
This course will cover advanced usage and understanding of programming concepts using Python within the Linux environment. By the end of the course, students will not only possess strong programming capabilities but will also have a firm grasp on scientific computing fundamentals. Students should already have a working knowledge of bash, python, pylint, tmux/GNU screen, X11 tunnelling, and at least one terminal based editor (vim, nano, joe, etc) from ENGR 131 or ENGR 132.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ENGR 131 [Min Grade: D] or ENGR 132 [Min Grade: D]

ECE 121 Introduction to Entertainment Engineering 3.0 Credits
This introductory survey course will focus on the four prevailing entertainment media: music, images, video, and games. We will explore how each medium is represented digitally and reveal the technologies used to capture, manipulate and display such content. Technical standards used in everyday entertainment devices (mp3, H.264, JPEG 1080p, HDMI) will be explained in layman's terms. The goal is to provide students with technical literacy for using digital media.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

ECE 200 Digital Logic Design 4.0 Credits
Number systems and representation, two's complement arithmetic, digital logic devices, switching algebra, truth tables, minimization of Boolean functions, combinational logic design and analysis, sequential circuit analysis and design.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ECE 201 Foundations of Electric Circuits I 4.0 Credits

Covers basic electric circuit concepts and laws; circuit theorems; mesh and node methods; analysis of first-order electric circuits; forced and natural response; sinusoidal steady state analysis; complex frequency.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is CAE or classification is Freshman
Prerequisites: PHYS 102 [Min Grade: D]

ECE 203 Programming for Engineers 3.0 Credits

Fundamentals of computer organization; rudiments of programming including data types, arithmetic and logical expressions, conditional statements, control structures; problem solving techniques for engineers using programming; object-oriented programming; arrays; simulation of engineering systems; principles of good programming practice.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ECE 211 Electrical Engineering Principles 3.0 Credits

Not open to electrical or mechanical engineering students. Covers basic techniques of electric circuit analysis, electronic devices, amplifiers, operational amplifier, and fundamentals of instrumentation.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is EE or major is MECH or classification is Freshman
Prerequisites: (MATH 201 [Min Grade: D] or ENGR 231 [Min Grade: D] or MATH 261 [Min Grade: D]) and (PHYS 211 [Min Grade: D] or PHYS 281 [Min Grade: D] or PHYS 102 [Min Grade: D])
Corequisite: ECE 212

ECE 212 Electrical Engineering Principles Laboratory 1.0 Credit

Not open to electrical or mechanical engineering students. Includes experiments involving concepts discussed in ECE 211.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is EE or major is MECH or classification is Freshman
Corequisite: ECE 211

ECE 301 Foundations of Electric Circuits II 4.0 Credits

Covers analysis of operational amplifiers, second-order electric circuits; ac power; and an introduction to the Laplace transform.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECE 201 [Min Grade: D] and (ENGR 232 [Min Grade: D] or MATH 262 [Min Grade: D])

ECE 302 Design with Embedded Processors 3.0 Credits

A project-based course on design and implementation of mixed signal systems with embedded processors (digital, analog and software) with applications in signal processing, control, wireless and Internet of Things.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECE 203 [Min Grade: D] or ENGR 131 [Min Grade: D] or ENGR 132 [Min Grade: D] or CS 171 [Min Grade: D]

ECE 303 ECE Laboratory 3.0 Credits

This course has an emphasis on measurement systems, and develops both theory and application. The software and digital and analog hardware used are relevant to both electrical and computer engineers. Multi-week design projects and design teams are used to prepare students for Senior Design work.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECE 301 [Min Grade: D] or ECE 201 [Min Grade: D] and (ENGR 103 [Min Grade: D] or ENGR 113 [Min Grade: D])

ECE 361 Probability and Data Analytics for Engineers 4.0 Credits

This course will cover topics related to probability and statistics. Probability topics include sample space and probability, discrete and continuous random variables (single and multiple), and their properties and applications to modeling, and the central limit theorem. Topics in statistics will include parametric and non-parametric hypothesis testing, data analytics and related topics, computational approaches and bootstrapping.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ENGR 232 [Min Grade: C] or MATH 262 [Min Grade: C]

ECE 362 Engineering Statistics 3.0 Credits

This course will cover topics related to statistics and probability. Probability topics include sample space and probability; discrete and continuous random variables, expectation, variance, the law of large numbers and the central limit theorem. Statistics topics include properties of a random sample, principles of data reduction, point estimation, hypothesis testing, interval estimation, and linear regression.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (ENGR 202 [Min Grade: D] and ENGR 231 [Min Grade: D]) or (ENGR 202 [Min Grade: D] and MATH 261 [Min Grade: D])

ECE 391 Introduction to Engineering Design Methods 1.0 Credit

Introduces the design process, including information retrieval, problem definition, proposal writing, patents, and design notebooks. Includes presentations on problem areas by experts from industry, government, and education.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

ECE 403 Computing and Control 4.0 Credits

The computer in the loop is examined for binary inputs and outputs taking into account processing and actuator delays. The concept of stability is introduced and the inherent delay introduced by computer systems and software on stability is explored. The use of interrupts to implement fixed-rate sampling is introduced along with practical implementation of PID controllers. The Kalman filter is introduced as a stochastic state observer under measurement uncertainty as well as the extended Kalman filter to address non-linear systems. Students will perform laboratory projects and present a final group project.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECES 301 [Min Grade: D] and ECE 361 [Min Grade: D]

ECE 491 [WI] Senior Design Project I 2.0 Credits
Introduces the design process, including information retrieval, problem definition, proposal writing, patents, and design notebooks. Includes presentations on problem areas by experts from industry, government, and education. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: ECE 391 [Min Grade: D] and ECE 361 [Min Grade: D]

ECE 492 [WI] Senior Design Project II 2.0 Credits
Continues ECE 491. Requires written and oral progress reports. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: ECE 491 [Min Grade: D]

ECE 493 Senior Design Project III 4.0 Credits
Continues ECE 492. Requires written and oral final reports, including oral presentations by each design team at a formal Design Conference open to the public and conducted in the style of a professional conference.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: ECE 492 [Min Grade: D]

ECE I199 Independent Study in ECE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECE I299 Independent Study in ECE 12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECE I399 Independent Study in ECE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECE I499 Independent Study in ECE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECE T180 Special Topics in ECE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECE T280 Special Topics in ECE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECE T380 Special Topics in ECE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECE T480 Special Topics in ECE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

Electrical & Computer Engineering - Power Engineering

Courses

ECEP 352 Electric Motor Control Principles 4.0 Credits
Introduces machinery principles, magnetic circuits, three-phase circuits, the electrical and economic structure of the power industry, ac and dc machine fundamentals, and power electronic converters and their interfaces with electric motors. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEE 302 [Min Grade: D] (Can be taken Concurrently) (ECE 201 [Min Grade: D] or ECES 211 [Min Grade: D])

ECEP 354 Energy Management Principles 4.0 Credits
Covers principles of power engineering, including the electrical and economic structure of the power industry (distribution, subtransmission, and bulk transmission levels; environmental issues; the electrical system analysis; the thermal system analysis; links between electromechanics and thermodynamics; and safety issues). Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEE 302 [Min Grade: D] (Can be taken Concurrently) (ECE 201 [Min Grade: D] or ECES 211 [Min Grade: D])

ECEP 371 Introduction to Nuclear Engineering 2.0 Credits
This course introduces the student to the fundamental topic of nuclear engineering. This course should be the first course for students interested in the nuclear engineering minor, as all of the topics will be discussed in greater detail in other courses. Topics include atomic and nuclear structure, binding energy, reaction kinetics and energetics, and radioactive decay.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 201 [Min Grade: C]

ECEP 372 Radiation Detection and Measurement 3.0 Credits
Introduces students to the fundamentals of radiation detection, and applications of radiation detection equipment.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 201 [Min Grade: D]

ECEP 380 Introduction to Renewable Energy 3.0 Credits
Introduction to Renewable Energy is an undergraduate survey course for engineers, scientists and others interested in energy systems and applications. The course introduces students to the mix of current major electric power sources and the pressures that are forcing a transition to renewable sources. Wind and solar energy will be studied in detail, with others as time allows. Course culminates with an integrating off-grid energy system design.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 122 [Min Grade: D] and (PHYS 102 [Min Grade: D] or PHYS 115 [Min Grade: D] or PHYS 154 [Min Grade: D])

ECEP 402 Theory of Nuclear Reactors 4.0 Credits
Introduces students to atomic and nuclear physics, radiation interaction with matter, components of nuclear reactors, neutron diffusion and moderation, nuclear reactor theory, and heat removal from nuclear reactors.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 201 [Min Grade: D] and (ENGR 232 [Min Grade: D] or MATH 210 [Min Grade: D] or MATH 262 [Min Grade: D])

ECEP 403 Nuclear Power Plant Design & Operation 3.0 Credits
Introduces students to the design of nuclear power plants. Topics covered include electrical transmission, non-nuclear related equipment, fluid flow, heat transfer, thermodynamics, heat exchangers, pump, valves, piping and nuclear reactor design. Course includes a final project which is the design of a nuclear power plant.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 201 [Min Grade: D]

ECEP 404 Introduction to Nuclear Engineering 2.0 Credits
Introduces the fundamental scientific, technical, social and ethical issues in nuclear engineering; nuclear reactions and readiation, radiation protection and control, nuclear energy production and utilization, nuclear fuel cycle, nuclear fuel cycle, nuclear materials, controlled fusion and thermonuclear plasma systems, basics of plasma physics and plasma chemistry, nuclear waste management, nuclear reactor safety, analysis of severe nuclear accidents, risk assessment and related issues of engineering ethics.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 201 [Min Grade: D] and (ENGR 210 [Min Grade: D] or CHE 206 [Min Grade: D])

ECEP 406 Introduction to Radiation Health Principles 3.0 Credits
This course is intended to impart radiation safety knowledge to the nuclear engineering student. A fundamental knowledge of radiation safety is critical for all nuclear engineers.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 201 [Min Grade: D]

ECEP 411 Power Systems I 3.0 Credits
Covers steady state generator, transformer and transmission line modeling used for balanced steady state power system analysis including three-phase to single-phase model conversion, per-unit analysis, generator and line loadability, transformer and transmission line voltage regulation and reactive compensation.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEP 352 [Min Grade: D]

ECEP 412 Power Systems II 4.0 Credits
Covers y-bus based analysis of power systems including steady-state power-flow models and algorithms, economic dispatch of power generation, load-frequency control and introduction to transient stability analysis including time-domain simulation and equal area criterion.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEP 411 [Min Grade: D]

ECEP 413 Power Systems III 3.0 Credits
Covers Z-bus-based analysis of power systems including symmetrical component networks of generators, transformers, transmission lines and loads, symmetrical and unbalanced three-phase bus and line faults, and an introduction to power system protection.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEP 412 [Min Grade: D]

ECEP 421 Modeling and Analysis of Electric Power Distribution Systems 3.0 Credits
Introduction to power distribution systems; balanced and unbalanced systems, component and load modeling, radial and weekly meshed topologies; algorithms for unbalanced power studies including radial and general structure solver.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: ECEP 352 [Min Grade: C]
Corequisite: ECEP 411

ECEP 422 Power Distribution Automation and Control 3.0 Credits
Focuses on distribution management systems and their application: including optimizing network operation - capacitor placement and control, network reconfiguration, service restoration. Modern solution technologies are addressed.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEP 421 [Min Grade: C]

ECEP 423 Service and Power Quality Distribution Systems 3.0 Credits
Focus on power distribution systems: service and power quality assessment including stat estimation, voltage quality, trouble call analysis, service restoration, component and system reliability assessment.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEP 422 [Min Grade: C]

ECEP 431 Advanced Electromagnetic Energy Conversion I 4.0 Credits
Covers theory and operation of alternating current machinery, with emphasis on design alternatives and the effects of design on performance. Includes construction of machine models from laboratory measurements.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEP 352 [Min Grade: D]

ECEP 432 Advanced Electromagnetic Energy Conversion II 4.0 Credits
Covers dynamic behavior and transient phenomena of rotating machines and the mathematical models used to describe them, generalized machine theory, measurement of parameters for the mathematical models, and measurement of dynamic and transient behavior.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEP 431 [Min Grade: D]

ECEP 441 Protective Relaying 3.0 Credits
Covers operating principles of electromechanical and static relays, fault clearance, and protection of individual parts of a power system. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEP 411 [Min Grade: D] (Can be taken Concurrently)ECEP 352 [Min Grade: D]

ECEP 451 Power Electronic Converter Fundamentals 3.0 Credits
Fundamentals of power electronics that include waveforms, basic power switch properties and magnetic circuits. Introduction to basic power electronic converter circuits: diode and phase-controlled rectifies and inverters; switch-mode converters. Applications to DC and AC power supply systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEP 352 [Min Grade: D]

ECEP 452 Experimental Study of Power Electronic Converters 3.0 Credits
Experimental study of common power electronic converters: diode rectifiers, phase-controlled rectifies, switch-mode inverters. Both hardware and software studies. Additional lectures on: Study of DC-DC switch-mode converters.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEP 451 [Min Grade: D]

ECEP 453 Applications of Power Electronic Converters 3.0 Credits
Provides a first look at various power electronic applications in residential, commercial and industrial sites. Examples include utility application such as static var compensators (SVC), thyristor switch capacitors (TSC), high voltage direct-current (HVDC) transmission systems among others. In addition, fundamentals of motor drives and their controls are covered. Examples include induction, DC synchronous and specialized motors.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEP 451 [Min Grade: D]

ECEP 461 High Voltage Laboratory 1.0 Credit
Requires students to perform four basic experiments to become familiar with high-voltage techniques and then do a high-voltage design project of their own choosing.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEP 352 [Min Grade: D]

ECEP 471 Power Seminar I 0.5 Credits
Discusses current developments in power system operation and research, concentrating on current and future energy sources.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ECEP 472 Power Seminar II 0.5 Credits
Discusses current developments in power system operation and research, concentrating on generating stations, transmission lines, and substations.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ECEP 473 Power Seminar III 0.5 Credits
Discusses current developments in power system operation and research, concentrating on distribution, security, and economics.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ECEP 480 Solar Energy Engineering 3.0 Credits
Covers design of grid-connected and battery backup grid-connected photovoltaic systems. Both electrical and mechanical aspects are included. Topics include system components (solar cells, charge controllers, maximum power point trackers, inverters, etc.), system economics, computer and web-based design aids, electrical codes and standards, externalities of PV systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore
Prerequisites: ECEE 302 [Min Grade: D] or ECEE 352 [Min Grade: D] or CHE 431 [Min Grade: D] or ECEP 380 [Min Grade: D]

ECEP 497 Research in Power Systems 0.5-12.0 Credits
Requires independent study in a topic approved by the faculty.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEP I199 Independent Study in ECEP 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEP I299 Independent Study in ECEP 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEP I399 Independent Study in ECEP 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEP I499 Independent Study in ECEP 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

ECEP T180 Special Topics in ECEP 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEP T280 Special Topics in ECEP 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

ECEP T380 Special Topics in ECEP 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEP T480 Special Topics in ECEP 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

Electrical & Computer Engineering - Computers

Courses

ECEC 201 Advanced Programming for Engineers 3.0 Credits
This course will cover advanced usage and understanding of programming concepts using the C programming language within a Linux development environment. C will serve as a foundation for future embedded firmware and system level software authorship as well as a means to better understand the underlying program execution model and memory organization used by modern computing systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ENGR 131 [Min Grade: D] or ENGR 132 [Min Grade: D] or ECE 203 [Min Grade: D] or CS 171 [Min Grade: D]

ECEC 204 Design with Microcontrollers 3.0 Credits
Offers hands-on experience in the design of controllers that incorporate microcontrollers as an embedded component in a larger system. The microcomputer topics to be studied will include architecture, software, programming and interfaces.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (ECE 200 [Min Grade: D] or CS 270 [Min Grade: D]) and (ECEC 201 [Min Grade: D] or ECEC 301 [Min Grade: D])

ECEC 302 Digital Systems Projects 3.0 Credits
Studies the theory of digital system design and the topdown design methodology using hardware description language and software tools for simulation, synthesis and Field Programmable Gate Array (FPGA) implementation.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (ECE 105 [Min Grade: D] or CS 172 [Min Grade: D] or ECE 203 [Min Grade: D]) and (ECE 200 [Min Grade: D] or CS 270 [Min Grade: D])

ECEC 352 Secure Computer Systems: Design Concepts 4.0 Credits
Covers concepts of secure computation, including economics vs. faults, errors, and hidden messages; mathematical foundations of secure computing; design issues in fault-tolerant computing; and testability and cryptography.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEC 302 [Min Grade: D] and MATH 221 [Min Grade: D]

ECEC 353 Systems Programming 3.0 Credits
This course introduces computer systems, including interaction of hardware and software through the operating system, from the programmer's perspective. Three fundamental abstractions are emphasized: processes, virtual memory, and files. These abstractions provide programmers a common interface to a wide variety of hardware devices. Topics covered include linking, system level I/O, concurrent programming, and network programming.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CS 265 [Min Grade: D] or ECEC 201 [Min Grade: D]

ECEC 355 Computer Organization & Architecture 3.0 Credits
This course will cover the principles of designing microprocessors using solid engineering fundamentals and quantitative cost/performance trade-offs. Topics will cover instruction set architectures, arithmetic for computers, assessing and understanding processor performance, processor datapath and control, pipelining, cache design, and virtual-memory design.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEC 302 [Min Grade: D]

ECEC 356 Embedded Systems 4.0 Credits
Lectures will cover theoretical concepts of embedded and cyber#physical systems including discrete and continuous dynamics, hybrid systems, state machines, concurrent computation, embedded systems architecture and scheduling. Lab involves programming embedded applications for the decentralized software services architecture using C# and the Microsoft Robotics Software Development Kit (SDK) together with the hardware image processing and tracking capabilities of the Kinect sensor.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEC 204 [Min Grade: D] or ECEC 304 [Min Grade: D]

ECEC 357 Introduction to Computer Networks 3.0 Credits
History of the Internet; introduction to packet switching, circuit switching and virtual circuit switching; statistical multiplexing; protocol layering; metrics of network performance including bandwidth, delay and loss; medium access protocols and Ethernet; routing algorithms; end-to-end issues; flow and congestion control; an overview of application layer protocols.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECE 105 [Min Grade: D] or ECE 203 [Min Grade: D] or CS 171 [Min Grade: D]

ECEC 402 Digital System Projects Embedded Design 3.0 Credits
A project-based course on real-time applications using Field Programmable Gate Array (FPGA), embedded processors (software), IP (Intellectual Property) cores library and custom IP cores.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEC 302 [Min Grade: D] and (ECEC 204 [Min Grade: D] or ECEC 304 [Min Grade: D])

ECEC 411 Computer Hardware 3.0 Credits
Covers the design and performance of computer hardware devices, including direct memory access, priority arbitration, double buffering, and bus standards. Fall.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: ECEC 355 [Min Grade: D]

ECEC 412 Modern Processor Design 3.0 Credits
This course introduces modern processor design in a systematic manner. It discusses dynamically scheduled superscalar techniques including multi-issue, dynamic instruction scheduling, speculative execution, and branch prediction; advanced cache designs, and new techniques including SMT and VLIW. The course provides a comprehensive coverage of modern processor architectures.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEC 355 [Min Grade: D] or CS 281 [Min Grade: D]

ECEC 413 Introduction to Parallel Computer Architecture 3.0 Credits
This course provides an introduction to the fundamental principles and engineering trade-offs involved in designing modern parallel computers (multi-processors). Topics covered include, but are not limited to, shared-memory and message-passing programming, cache-coherence, synchronization, scalable distributed memory multi-processors, and interconnection techniques.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEC 355 [Min Grade: D] or CS 281 [Min Grade: D]

ECEC 414 High Performance Computing 3.0 Credits
This course is an introduction to high performance computing, including both concepts and applications. Course contents will include discussions of different types of high performance computer architectures (multi-core/multi-threaded processors, parallel computers, etc.), the design, implementation, optimization and analysis of efficient algorithms for uni-processors, multi-threaded processors, and parallel computers, and high performance programming.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEC 355 [Min Grade: D] or (CS 281 [Min Grade: D] and CS 282 [Min Grade: D])

ECEC 421 Introduction to Operating Systems I 3.0 Credits
Covers basic concepts of computer operating systems, including multiprocessing and multiprogramming systems, lock operations, synchronization, and file structures. Winter.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: ECEC 355 [Min Grade: D] and CS 260 [Min Grade: D]

ECEC 422 Introduction to Operating Systems II 3.0 Credits
Further develops the topics of ECEC 421. Spring.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEC 421 [Min Grade: D]

ECEC 431 Introduction to Computer Networks 3.0 Credits
Covers topics in computer and telecommunications network design.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECE 200 [Min Grade: D] and CS 260 [Min Grade: D]

ECEC 432 Internet Architecture and Protocols 3.0 Credits
Covers architecture, protocols, and services of the Internet with an analytical approach focused on design principles; Internet architecture and topology; architecture of web and mail servers; router architectures; routing protocols; multicasting; multimedia over IP and associated protocols; Quality-of-Service issues in the Internet.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEC 357 [Min Grade: D] or CS 472 [Min Grade: D]

ECEC 433 Network Programming 3.0 Credits
Covers application layer protocol and how applications use the transport layer; principles and practice of network programming; the client-server model; concurrent processing; introduction to sockets and related functions client and server software design with examples; principles, issues and challenges in e-mail and web application protocols; security protocols; and network life system concepts.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEC 357 [Min Grade: D]

ECEC 441 Robotic Computer Interface & Control I 3.0 Credits
Covers fundamentals of robotics systems, including mechanics, actuators, sensors, kinematics, and inverse kinematics. Fall.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: ECES 356 [Min Grade: D]

ECEC 442 Robotic Computer Interface & Control II 3.0 Credits
Covers robot dynamics, Lagrangian and Newton Euler methods, linear control of robots, path planning, and computer implementation. Winter.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEC 441 [Min Grade: D]

ECEC 443 Robotic Computer Interface & Control III 3.0 Credits
Covers robot-computer interface methods, including redundancy, optimal control, robustness, nonlinear control, adaptive control, and multiprocessor control. Spring.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEC 442 [Min Grade: D]

ECEC 451 Computer Arithmetic 3.0 Credits
This course provides an introduction to number representations used in computer arithmetic, issues of complexity in arithmetic operations, fixed point arithmetic, floating point arithmetic, and residue number systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECE 200 [Min Grade: D] and ECEC 355 [Min Grade: D]

ECEC 453 Image Processing Architecture 3.0 Credits
This course covers applications of computing techniques and hardware in image (still and video) processing. Methods of compression (lossless, lossy), video compression, JPEG standards, MPEG standards, processing requirements, and implementations for multimedia.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECE 200 [Min Grade: D] and ECES 301 [Min Grade: D] and ECES 303 [Min Grade: D]

ECEC 455 Intelligent System Architectures 3.0 Credits
This course outlines the principles of designing the architectures for intelligent systems. Methods of knowledge representation are compared for a variety of engineering problems. Methods of sensing and behavior generation are demonstrated for applications in large engineering and information systems including autonomous robots. Principles of goal-oriented computers are discussed, and modules of intelligent systems architectures are described. Theoretical fundamentals and practical techniques for learning are also covered.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: MATH 221 [Min Grade: D] and ECEC 355 [Min Grade: D]

ECEC 457 Security in Computing 3.0 Credits
The course introduces ideas from Cryptography and Fault Tolerant Computing. Cryptography studies how to artificially create distortions that being interwoven with computations mask them from eavesdropping. Fault Tolerance studies techniques of suppressing effects of natural noises that operate in computation channels. The course deals with both some introductory issues in Public Key Cryptography and some important aspects of designing Fault Tolerant Systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEC 355 [Min Grade: D]

ECEC 459 Testing of Hardware 3.0 Credits
Testing has become the largest expense item in the semiconductor industry. There is rapidly being developed new techniques in testing, design for test and built-in self-test because no existing set of techniques can satisfy the existing and future needs. The course reviews, in a unified way, important issues in testing and diagnosis of hardware. Together with the "Security in Computing" course, it brings a design engineer student to the state of the art level in the field.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEC 355 [Min Grade: D]

ECEC 471 Introduction to VLSI Design 3.0 Credits
This is an introductory course where systematic understanding, design and analysis of digital VLSI integrated circuits will be covered. The course will begin with a review of CMOS transistor operation and semiconductor processes. Logic design with CMOS transistor and circuit families will be described. Specifically, layout, design rules, and circuit simulation will be addressed. Performance metrics will be analyzed in design and simulation.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECE 200 [Min Grade: D] or CS 270 [Min Grade: D]

ECEC 472 Custom VLSI Design & Analysis I 3.0 Credits
This is the first of two courses offered on Custom Very Large Scale
Integration (VLSI) circuit and systems design and analysis. An
understanding of VLSI integrated circuits is achieved through cir- cuit
design and analysis. This course focuses exclusively on high performance
digital CMOS VLSI circuit and systems design, although some topics on
mixed-signal circuits are also addressed.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEC 471 [Min Grade: D]

ECEC 473 Custom VLSI Design & Analysis II 3.0 Credits
This is the second of two courses offered on Custom VLSI circuit and
systems design and analysis. An understanding of VLSI integrated
circuits is achieved through circuit design and analysis. This course
focuses exclusively on high performance digital CMOS VLSI circuit and
systems design, although some topics on mixed-signal circuits are also
addressed. The primary focus is on-chip power management. Power
generation techniques are discussed and different power converters are
analyzed. Power distribution networks are presented with a focus on the
different distribution architectures and output impedance characteristics.
Techniques to reduce power supply noise are also provided. A secondary
focus examines substrate noise in mixed-signal systems and techniques
to reduce substrate noise.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEC 471 [Min Grade: D]

ECEC 474 ASIC Design I 3.0 Credits
This course will focus exclusively on digital CMOS Application Specific
Integrated Circuit (ASIC) systems design and automation. The ASIC
physical design flow, including logic synthesis, floorplanning, placement,
clock tree synthesis, routing and verification will be presented. These
back-end physical design flow steps will also be covered through hands-
on practice using industrial VLSI CAD tools. Contemporary design
practices will be reviewed and presented in experiments.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECE 200 [Min Grade: D] and (ECEC 355 [Min Grade: D]
or CS 281 [Min Grade: D])

ECEC 475 ASIC Design II 3.0 Credits
Design and analysis of Application Specific Integrated Circuits (ASICs)
will be covered from a systems design perspective. System timing,
arithmetic building block and memory block design processes will be
presented. Design tasks in a quarter-long, small-complexity processor
design project will cover the back-end of the IC design flow range, from
RTL synthesis to timing and power analysis. Projects will be performed in
a hierarchical group, similar to an industrial setting, with other graduate
and undergraduate students.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEC 474 [Min Grade: D]

ECEC 476 Hardware Security & Trust 3.0 Credits
The course covers a broad range of current topics in the areas of security
and protection of modern integrated circuits. The covered material
includes cryptographic processor and processing overhead, physical and
invasive attacks, side-channel attacks, physically unclonable functions,
hardware-based true random number generators, watermarking of
intellectual property, FPGA security, passive and active metering for
prevention of piracy, access control, and emerging threats to current and
next- generation technologies.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEC 471 [Min Grade: D] or ECEC 571 [Min Grade: D]

ECEC 486 Cell and Tissue Image Analysis 3.0 Credits
Theory of supervised and unsupervised pattern recognition techniques,
with practical programming projects.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECE 361 [Min Grade: D]

ECEC 487 Pattern Recognition 3.0 Credits
Theory of supervised and unsupervised statistical pattern recognition,
presented through practical programming techniques.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECE 361 [Min Grade: D]

ECEC 497 Research In Computer Engineering 0.5-12.0 Credits
Computer engineering students only. Requires independent research in a
field approved by the faculty.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if major is CE.

ECEC I199 Independent Study in ECEC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEC I299 Independent Study in ECEC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEC I399 Independent Study in ECEC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEC I499 Independent Study in ECEC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if major is CE.
Cannot enroll if classification is Freshman or Sophomore

ECEC T180 Special Topics in ECEC 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEC T280 Special Topics in ECEC 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEC T380 Special Topics in ECEC 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEC T480 Special Topics in ECEC 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

Electrical & Computer Engineering - Electroph

Courses

ECEE 302 Electronic Devices 4.0 Credits
Covers principles of operation of semiconductor devices, including PN
diodes, bipolar transistors, and field effect transistors (JFET, MOSFET,
MESFET). Applications of PN junctions, including solar cells, led, laser
diodes. Laboratories reinforce lecture material by allowing students to
build, measure and analyze data from simple devices.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGR 220 [Min Grade: D]

ECEE 304 Electromagnetic Fields & Waves 4.0 Credits
Covers vector calculus, Coulomb's Law, Gauss' Law, Ampere's Law,
Maxwell's equations, Electromagnetic (EM) fields in devices, EM fields in
circuits, EM fields in machinery, EM waves, biological effects.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 291 [Min Grade: D]

ECEE 352 Analog Electronics 4.0 Credits
Teaches the fundamentals of electronic circuit analysis and design by
means of practical projects, such as a dc power supply and an audio
amplifier. Covers design with discrete components as well as integrated
circuit design.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEE 302 [Min Grade: D]

ECEE 354 Wireless and Optical Electronics 4.0 Credits
Covers propagation of waves in various media as it relates to wireless
communications: reflection, transmission, polarization, wave packets,
dispersion, radiation and antennas, microwave electronic devices, optical
wave guides, and fiber optics.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECES 301 [Min Grade: D] and ECES 303 [Min Grade: D]
and ECEE 304 [Min Grade: D]

ECEE 421 Advanced Electronics I 4.0 Credits
Application-and design-focused course. Analyzes feedback in electronic
circuits such as operational amplifiers. Covers design and applications of
active filters and other typical electronic circuitry. Includes experiments
in the design of multistage transistor circuits, feedback loops, operational
amplifiers, and active filters.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEE 352 [Min Grade: D]

ECEE 422 Advanced Electronic Circuits I 3.0 Credits
Application-and design-focused course. Covers analysis and design of
communication circuits and non-linear active circuits; oscillators, mixers,
IF and RF amplifiers; and AM and FM modulators.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEE 421 [Min Grade: D]

ECEE 423 Advanced Electronics Circuits II 3.0 Credits
Application-and design-focused course. Covers non-linear circuits;
function and wave form generators; log-amp, multipliers, dividers,
power amp, and phase-lock loops; and design of electronics needed to
implement different logic circuit families.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEE 421 [Min Grade: D]

ECEE 434 Digital Electronics 4.0 Credits
Covers basic digital integrated circuit building blocks (inverters, nor and
nand logic), CMOS logic gates (dc and transient behavior), drivers, and
digital circuits and systems (PLA, gate array, memory). Experiments in
semiconductor material characterization, device characterization, circuit
and device simulations.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEE 302 [Min Grade: D]

ECEE 441 Lightwave Engineering I 3.0 Credits
Covers fundamentals of wave propagation, including propagation in various fiber wave guides and field distributions, diffraction, attenuation, dispersion, information capacity, and other analytic and design considerations in fiber systems. Fall.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEE 304 [Min Grade: D]

ECEE 442 Lightwave Engineering II 3.0 Credits
Covers operating principles, construction, and characteristics of sources, couplers, and detectors used in optical systems. Includes equivalent circuit models and principles of generation, transmission, and reception. Winter.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEE 441 [Min Grade: D]

ECEE 443 Lightwave Engineering III 3.0 Credits
Covers applications of devices and systems in such areas as data, voice, and image trans-mission; industrial automation; process control; medicine; and computers. Includes basic measurement systems. Spring.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEE 442 [Min Grade: D]

ECEE 451 Electroacoustics 3.0 Credits
Applications-oriented course. Covers fundamentals of vibrating systems; equations of motion; acoustical, electrical, and mechanical analogs; properties of waves in fluids; acoustic impedance and plane wave transmission; application to design of transducers; and application of acoustic waves in medical imaging, non-destructive testing, and the biomedical field.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Junior or Pre-Junior or Sophomore

ECEE 471 RF Components and Techniques 4.0 Credits
This course covers microwave networks (Z, Y, S, T ABCD Parameters), signal flowgraph, impedance matching techniques (lumped and distributed, quarter wave transformers), circulators and isolators, directional couplers (branch line, Wilkinson, Lange, slot waveguide), and filters (lowpass, bandpass, bandstop, highpass). CAD laboratory and design projects are an integral part of this course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEE 354 [Min Grade: D]

ECEE 472 RF Electronics 4.0 Credits
This course covers static and dynamic characteristics of transistors, unipolar (MOSFET, MESFET, HEMT), bipolar (BJT, HBT), LNA design and realization, power amplifiers, distributed amplifiers, switches, limiters, phase shifters, detectors, mixers, oscillators (Colpitts, YIG turned, reflection, transmission, DRO). CAD laboratory and design projects are an integral part of this course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEE 471 [Min Grade: D]

ECEE 473 Antennas and Radiating Systems 4.0 Credits
This course covers short and magnetic dipole, radiation pattern, radiation resistance, directivity and gain, line antennas (dipoles, monopoles, V and inverted V antennas), helix, Yagi-Uda, log-periodic, aperture antennas (slot, horn and reflector), printed circuit antennas (patch and spiral), and phased antennas. CAD laboratory and design projects are an integral part of this course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEE 471 [Min Grade: D]

ECEE 497 Research in Electrophysics 0.5-12.0 Credits
Requires independent research in a topic approved by the faculty.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEE I199 Independent Study in ECEE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEE I299 Independent Study in ECEE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEE I399 Independent Study in ECEE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEE I499 Independent Study in ECEE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

ECEE T180 Special Topics in ECEE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEE T280 Special Topics in ECEE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEE T380 Special Topics in ECEE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEE T480 Special Topics in ECEE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

Electrical & Computer Engineering - Systems

Courses

ECES 201 Introduction to Audio-Visual Signals 4.0 Credits
This introductory engineering course will focus on the digital signal representations commonly used in prevailing entertainment media: audio, images, and video. It will explore how each medium is represented digitally and convey the signal processing concepts used in storing, manipulating, transmitting, and rendering such content. The goal of the course is to provide non-engineering students with a fundamental understanding of core digital signal processing methods.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MATH 122 [Min Grade: D]

ECES 301 Signals and Systems I 4.0 Credits
This course covers time and frequency domain analysis of both continuous and discrete time signals and systems. Topics covered include a discussion of fundamental signals and basic system properties, convolution, the Fourier series, the Fourier transform, and introductory filtering. Students will learn to design and analyze the input output relationships of linear time-invariant signals, and will discuss applications in the field of electrical engineering.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECE 201 [Min Grade: D] and (ENGR 231 [Min Grade: D] or MATH 261 [Min Grade: D] or MATH 201 [Min Grade: D])

ECES 302 Transform Methods and Filtering 4.0 Credits
Covers the Fourier series and the Fourier transform, sinusoidal steady-state analysis and filtering, discrete-time systems and the Z-transform, discrete Fourier transform, network functions and stability, magnitude, phase, poles and zeroes, Nyquist criterion, the Nyquist plot and root loci, stability of one-ports, sensitivity, worst-case design and failure-tolerance.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (TDEC 221 [Min Grade: D] or ENGR 232 [Min Grade: D] or MATH 262 [Min Grade: D] or MATH 210 [Min Grade: D]) and ECE 201 [Min Grade: D]

ECES 303 Signals and Systems II 3.0 Credits
This course introduces Laplace & Z-transforms & their corresponding region of convergence as extensions of Fourier transform (FT) to deal with signals & systems (continuous & discrete) with no FT. It also covers the fundamentals of the highly used discrete Fourier transforms (DFT) and its fast computation. The fast Fourier transform (FFT) is also presented to digitize the FT of discrete signals. Optimal, uniform, & compandor quantizer, which complements the sampler, are also introduced to discretize the signal's range for achieving full digitization of the signal (the digitizer). To close the loop, all FT, regular and generalized, continuous & discrete are tied together.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECE 361 [Min Grade: D], BMES 310 [Min Grade: D] (Can be taken Concurrently)(ECES 301 [Min Grade: D] or ECES 302 [Min Grade: D])

ECES 304 Dynamic Systems and Stability 4.0 Credits
Covers linear time-invariant circuits and systems; two-and multi-terminal resistors, operational-amplifier circuits, first-order circuits, linear and nonlinear second-order systems, state equation and state variables, eigenvalues and eigenvectors, zero-input response, qualitative behavior of x'=Ax (stability and equilibria), qualitative behavior of x'=f(x), phase portraits, equilibrium states.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECES 301 [Min Grade: D]

ECES 306 Analog & Digital Communication 4.0 Credits
Covers signal sampling and reconstruction; modulation, angle modulation; digital communications systems, digital transmission.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (ECES 301 [Min Grade: D] or ECES 302 [Min Grade: D]) and ECE 361 [Min Grade: D]

ECES 352 Introduction to Digital Signal Process 4.0 Credits
Covers discrete-time signals, analog-digital conversion, time and frequency domain analysis of discrete-time systems, analysis using Z-transform, introduction to digital filters, discrete-time Fourier transform, Discrete Fourier Transform (DFT), and Fast Fourier Transform (FFT).
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECES 303 [Min Grade: D] or ECES 201 [Min Grade: D]

ECES 354 Wireless, Mobile & Cellular Communications 4.0 Credits
Covers concepts of wireless systems; propagation effects, including loss, dispersion, fading, transmission, and reception; mobile systems, including design of base units and mobile units; micro cells and pico cells; cell division, including frequency use and reuse; concepts of FDMA, TDMA, and CDMA; error rates and outage probability; and circuits and components for wireless and mobile systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECES 306 [Min Grade: D]

ECES 356 Theory of Control 4.0 Credits
Covers the foundations of control theory. Includes experiments and demonstrations during lectures and labs that may be jointly held, taking advantage of multimedia and computer-controlled apparatus.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECES 304 [Min Grade: D]

ECES 358 Computer Control Systems 4.0 Credits
Reviews principles of applications of computer control systems to a variety of industries and technologies, including manufacturing processes, robotic cells, machine cells, chemical processes, network control, investment portfolio control, and real-time expert and learning systems for diagnostics and quality control.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECES 356 [Min Grade: D]

ECES 411 Convex Optimization in Engineering Systems 3.0 Credits
Covers fundamental of convex optimization including convex sets, convex functions, linear and nonlinear constraints, complementary slackness, Lagrange multipliers, Lagrangian duality, and quadralic programming. Focuses on applications (e.g., signal processing, communications, computer networking, and portfolio management). Focuses on use of Matlab or equivalent software.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: ECES 301 [Min Grade: D] and ECES 303 [Min Grade: D] and (ENGR 361 [Min Grade: D] or ECE 361 [Min Grade: D])

ECES 412 Simulation of Stochastic Engineering Systems 3.0 Credits
Covers algorithms for generation of pseudo-random numbers, generation of random variates using the inverse transform, acceptance rejection techniques, Monte Carlo simulation, basics of point and interval estimation and hypothesis testing. Coverage of Markov chains, Markov chain Monte Carlo, Metropolis algorithm, simulated annealing, as time permits. Applications include computer networks, statistical physics, derivative pricing. Focus on use of Matlab or equivalent software.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: ECES 301 [Min Grade: D] and ECES 303 [Min Grade: D] and (ENGR 361 [Min Grade: D] or ECE 361 [Min Grade: D])

ECES 413 Strategies for Repeated Games 3.0 Credits
Covers the gambler's ruin problem, optimality of bold play for subfair games, the Martingale betting system, Kelly betting and the maximum growth rate in superfair games, the multi-armed bandit and it generalizations, Parrondo's paradox for coupled subfair games, basics of auction theory. Focus on use of Matlab or equivalent software.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: ECES 301 [Min Grade: D] and ECES 303 [Min Grade: D] and (ENGR 361 [Min Grade: D] or ECE 361 [Min Grade: D])

ECES 421 Communications I 3.0 Credits
Covers analog communications, including linear modulation methods (AM, DSB, SSB), exponential modulation (FM, PM), and noise effects on analog communication systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECES 306 [Min Grade: D]

ECES 422 Communications II 3.0 Credits
Covers analog (PAM, PPM) and digital (PCM, DM) pulse modulation systems, entropy, source coding, and channel coding.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECES 421 [Min Grade: D]

ECES 423 Communications III 3.0 Credits
Covers digital transmission systems, baseband and passband, spread-spectrum communications, and basics of wireless and mobile systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECES 422 [Min Grade: D]

ECES 434 Applied Digital Signal Processing 4.0 Credits
This course explores digital signal processing (DSP) concepts through the context of current applications, which range from video encoding to human genome analysis. Topics such as sampling, aliasing, and quantization, are considered in terms of the constraints of particular applications. Discrete-time linear systems, frequency-domain analysis, and digital filtering using Discrete Fourier Transform are examined in-depth and realized through application-specific lab projects.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECES 303 [Min Grade: D]

ECES 435 Recent Advances in Digital Signal Processing 4.0 Credits
Digital signal processing algorithms once thought to be impractical are now implemented in devices, such as household appliances & mobile phones. This course explores the computationally-intensive DSP methods including short-time linear prediction, cepstral analysis, and complex phase reconstruction as well as alternative signal representations and transforms, including the Hilbert, Chirp, and Discrete Cosine Transforms. Laboratory projects will focus on the implementation of these methods.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECES 303 [Min Grade: D]

ECES 436 Multi-disciplinary Digital Signal Processing 4.0 Credits
The applications of digital signal processing (DSP) span a wide range of problem domains and disciplines. This course explores the multi-disciplinary aspects of DSP by focusing on a core set of common methods applicable to problems in many fields, such as periodicity detection, signal and power spectrum estimation, and data modeling. Laboratory projects will utilize experiments drawn from a diversity of fields, including medicine, music analysis, image processing,voice/data communications and robotics.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECES 303 [Min Grade: D]

ECES 441 Bioinformatics 3.0 Credits
This course will focus on developing the computational, algorithmic, and database navigational skills required to analyze genomic data that have become available with the development of high throughput genomic technologies. We will also illustrate statistical signal processing concepts such as dynamic programming, hidden markov models, information theoretic measures, and assessing statistical significance. The goals will be achieved through lecture and lab exercises that focus on genomic databases, genome annotation via hidden markov models, sequence alignment through dynamic programming, metagenomic analyses, and phylogenetics with maximum likelihood approaches.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

ECES 444 Systems and Control I 4.0 Credits
This course focuses on the state space approach to systems analysis and control for use in such applications as: Automated Equipment, Robotics, Motor Control, Process Control and Aerospace. A brief review of Classical Controls provides the seaway for state space modeling as well as state variable feedback and observer based state control. Optimal Control (Performance Index for gain selection) as well as System Identification techniques and Lagrangian Dynamics are introduced. The course includes a set of laboratory experiments where students get hands-on experience with the core theoretical material.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECES 356 [Min Grade: D]

ECES 445 Systems and Control II 4.0 Credits
This course focuses on Linear Quadratic Gaussian Control for use in such applications as: Automated Equipment, Robotics, Motor Control, Process Control and Aerospace. The course introduces the Kalman Filter as a stochastic observer and then extends on applying it to target tracking, system identification and use in control.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECES 356 [Min Grade: D] and ECE 361 [Min Grade: D]

ECES 446 Systems and Control III 4.0 Credits
This course introduces nonlinear systems and some commonly used industrial non-linear control techniques relevant to such applications as: Automated Equipment, Robotics, Motor Control, Process Control and Aerospace. Foundation topics include: equilibrium and stability of nonlinear systems, analysis of limit cycles and region of attraction, Lyapounov stability, Nyquist stability for limit cycle analysis. Control techniques include topical solutions: Model Reference Adaptive control; Adaptive Disturbance Rejection Control, Robust and H-infinity Control, and Fuzzy Logic Control.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECES 356 [Min Grade: D]

ECES 450 Statistical Analysis of Metagenomics 3.0 Credits
This course focuses on developing the computational and database navigational skills required to analyze genomic data. The goals will be achieved through lecture and exercises on genomic databases, programming for importing and pre-processing genomic data, high performance programming for analysis of high-throughput metagenomic analyses, and use of high-performance computing for phylogenetic reconstruction.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ECES 462 Medical Robotics II 3.0 Credits
This course will review the emerging, multidisciplinary field of Medical Robotics. The course includes multiple site/field visits to observe Medical Robot systems demonstrations and interaction with the medical team and system manufacturers.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECES 461 [Min Grade: D]

ECES 497 Research in Systems Engineering 0.5-12.0 Credits
Electrical engineering students only. Requires independent research in a topic approved by the faculty.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

ECES 499 Supervised Study in Systems Engineering 0.5-20.0 Credits
Requires independent study in a topic approved by the faculty.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ECES I199 Independent Study in ECES 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECES I299 Independent Study in ECES 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECES I399 Independent Study in ECES 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECES I499 Independent Study in ECES 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECES T180 Special Topics in ECES 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECES T280 Special Topics in ECES 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECES T380 Special Topics in ECES 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECES T480 Special Topics in ECES 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

Electrical Engineering Lab

Courses

ECEL 301 [WI] Electrical Engineering Laboratory 2.0 Credits
Offers laboratory experiences in each of the five ECE tracks: computers, controls/robotics, electronics, power and energy, and telecommunications. Each lab consists of a stand-alone module containing: lecture material providing basic theory, references, and laboratory experiments. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECE 200 [Min Grade: D] and ECE 201 [Min Grade: D] and (TDEC 132 [Min Grade: D] or TDEC 133 [Min Grade: D] or ENGR 104 [Min Grade: D] or ENGR 103 [Min Grade: D])

ECEL 302 ECE Laboratory II 2.0 Credits
Offers laboratory experiences in each of the five ECE tracks: computers, controls/robotics, electronics, power and energy, and telecommunications. Each lab consists of a stand-alone module containing: lecture material providing basic theory, references, and laboratory experiments. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEL 301 [Min Grade: D]

ECEL 303 ECE Laboratory III 2.0 Credits
Offers laboratory experiences in each of the five ECE tracks: computers, controls/robotics, electronics, power and energy, and telecommunications. Each lab consists of a stand-alone module containing: lecture material providing basic theory, references, and laboratory experiments.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECEL 302 [Min Grade: D]

ECEL 304 ECE Laboratory IV 2.0 Credits
This course offers laboratory experience, using both modeling software and digital and analog hardware relevant to both electrical and computer engineers. Multi-week design projects and design teams are used to prepare students for Senior Design work.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEL 303 [Min Grade: D]

ECEL 311 ECE Laboratory Methods I 3.0 Credits
Introduces students to MATLAB and PSpice, industry standard CAD software for electronics (analog and digital) and systems engineers. Solve DC bias, DC sweep, AC sweep, and transient problems in PSpice and MATLAB. Build and design simple digital circuits.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECE 200 [Min Grade: D] and ECE 201 [Min Grade: D] and ENGR 103 [Min Grade: D]

ECEL 312 ECE Laboratory Methods II 3.0 Credits
Covers introduction to transistor circuits, PSpice simulations of active devices, transfer function analysis, Bode analysis, active filter analysis and design. Programming and use of Microprocessors and/or FPGA. Perform measurements on devices and circuits.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ECEL 301 [Min Grade: D] or ECEL 311 [Min Grade: D]

ECEL 401 Lightwave Engineering Laboratory 3.0 Credits
Teaches fundamentals of interaction of light with matter. Waves and photons. nterference and diffraction. Optical fibers and free-space optics. Introduces students to optical communication and imaging.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (ECEL 301 [Min Grade: D] and ECEL 302 [Min Grade: D] and ECEE 302 [Min Grade: D]) or (ECEL 311 [Min Grade: D] and ECEL 312 [Min Grade: D] and ECEE 304 [Min Grade: D])

ECEL 402 Nano-Photonics Laboratory 3.0 Credits
Teaches a fundamental knowledge of nanophotonic materials, devices, and applications in a hands-on laboratory setting. Introduces students to photonic bandgaps, photonic crystals, optical sensing methods, holography methods and materials, concepts of surface plasmons and Plasmon resonance.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (ECEL 301 [Min Grade: D] and ECEL 302 [Min Grade: D] and ECEE 304 [Min Grade: D]) or (ECEL 311 [Min Grade: D] and ECEL 312 [Min Grade: D] and ECEE 304 [Min Grade: D])

ECEL 403 Bio-Photonics Laboratory 3.0 Credits
Teaches the fundamentals of the interaction of light with matter. Introduces students to different types of optical detection for biomedical applications,Quantized states of matter, Energy levels of atoms and molecules, Absorption, Scattering, Fluorescence, Imaging of cells and molecules, Spectroscopy, and Cancer precursors.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (ECEL 301 [Min Grade: D] and ECEL 302 [Min Grade: D] and ECEE 304 [Min Grade: D]) or (ECEL 311 [Min Grade: D] or ECEL 312 [Min Grade: D] or ECEE 304 [Min Grade: D])

ECEL 404 Software Defined Radio Laboratory 3.0 Credits
This course introduces students to the concept of software defined radio using the USRP hardware platform and GNU Radio software. Functional blocks of wireless communications systems will be discussed, programmed in Python, and tested on hardware.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (ECEL 301 [Min Grade: D] and ECEL 302 [Min Grade: D] and ECES 301 [Min Grade: D] and ECES 303 [Min Grade: D]) or (ECEL 311 [Min Grade: D] and ECEL 312 [Min Grade: D] and ECES 301 [Min Grade: D] and ECES 303 [Min Grade: D])

ECEL 405 Digital Systems Laboratory 3.0 Credits
Students will gain practical knowledge of digital systems and signal processing by designing, simulating, constructing, testing and refining a digital audio recording system.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (ECEL 301 [Min Grade: D] and ECEL 302 [Min Grade: D] and ECES 301 [Min Grade: D]) or (ECEL 311 [Min Grade: D] and ECEL 312 [Min Grade: D] and ECES 301 [Min Grade: D])

ECEL 407 General Purpose GPU Programming 3.0 Credits
This course will teach students how to develop parallel algorithms for the GPU and implement them using the CUDA progamming interface.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (ECEL 301 [Min Grade: D] and ECEL 302 [Min Grade: D] and ECEC 301 [Min Grade: D] and ECEC 355 [Min Grade: D]) or (ECEL 311 [Min Grade: D] and ECEL 312 [Min Grade: D] and ECEC 301 [Min Grade: D] and ECEC 355 [Min Grade: D])

ECEL I199 Independent Study in ECEL 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEL I299 Independent Study in ECEL 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEL I399 Independent Study in ECEL 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEL I499 Independent Study in ECEL 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEL T180 Special Topics in ECEL 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEL T280 Special Topics in ECEL 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEL T380 Special Topics in ECEL 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ECEL T480 Special Topics in ECEL 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

Electrical Engineering Technology

Courses

EET 102 Introduction to Engineering Technology 3.0 Credits
The main objective of this course is to introduce the basic concepts and the fundamentals of Engineering Technology (ET). Students are introduced to the four tracks (electrical, mechanical, industrial, and biomedical) in ET and work on the selected topics designed to enhance the problem solving techniques.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

EET 201 Circuit Analysis I 4.0 Credits
Introduction to the key electrical terms, basic laws and theorems of electric circuits by concentrating on Direct Current (DC) circuit analysis, power, and energy.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (PHYS 104 [Min Grade: D] or PHYS 102 [Min Grade: D]) and MATH 110 [Min Grade: D]

EET 202 Circuit Analysis II 4.0 Credits
Introduction to time domain (transient) analysis of R, L, C elements and energy storage in L and C circuits. The response of source-free RL, RC, and RLC circuits are developed followed by response to constant voltage and current sources.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 201 [Min Grade: D]

EET 204 Introduction to Nanotechnology 3.0 Credits
The course is an introduction to the physical, chemical and biological principles of nanotechnology. The course provides information on prevalent nanofabrication methods and materials, and familiarizes the students with the tools of nano measurements. The history, societal impact and the involvement of nanotechnology in everyday life are also discussed.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (CHEM 111 [Min Grade: D] and CHEM 113 [Min Grade: D]) or CHEM 101 [Min Grade: D] and (PHYS 103 [Min Grade: D] or PHYS 101 [Min Grade: D]) and (PHYS 104 [Min Grade: D] or PHYS 102 [Min Grade: D] or PHYS 151 [Min Grade: D])

EET 205 Digital Electronics 4.0 Credits
The objective of this course is to introduce AET students to fundamentals of digital electronics starting with the binary number system and proceeding to logic gates, Boolean algebra, combinational logic circuits, and the basic arithmetic units used in digital computers such as adders, counters and shift registers.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 201 [Min Grade: D]

EET 206 Analog Electronics I 4.0 Credits
Students are introduced to linear circuit analysis of passive and active semiconductor components, modeling of non-linear circuit elements, light and heat-dependent semiconductor devices, biasing of three-terminal devices, and semiconductor small-signal models.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 201 [Min Grade: D] and EET 202 [Min Grade: D]

EET 207 Introduction to Laboratory and Process Control 3.0 Credits
This course introduces students to programming techniques used to control laboratory experiments and industrial processes. The emphasis is on applications of LabView and C in real-world measurements and embedded systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

EET 208 Introduction to Programming for Embedded Systems 3.0 Credits
This course introduces students to programming techniques used in embedded systems. The emphasis is on applications of C in real-world measurements, analysis, and embedded systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

EET 209 Fundamentals of Virtual Instrumentation 3.0 Credits
This course introduces students to programming techniques used to monitor and control laboratory experiments and industrial processes. The emphasis is on applications of LabVIEW in real-world measurements and embedded systems, as well as on the practical aspects of interfacing a computer to various instruments including timing issues, real-time data acquisition and instrument control, instrument status, and acquisition speed.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

EET 307 Basic Power Systems I 3.0 Credits
Fundamentals of single-phase and three-phase power systems; introduction to symmetrical components and sequence impedances; power transfer modeling; the per-unit system; power transmission line impedance and admittances.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: EET 104 [Min Grade: D]

EET 310 Industrial Application of Nanotechnology 3.0 Credits
This course introduces students to nanotechnology materials, devices, and processes from the perspective of product development and process engineering, manufacturing scale-up, quality assurance, and reliability. Laboratory projects provide students with hands-on experience in fabricating and characterizing nanomaterials and nanodevices, and their applications for renewable energy, solid-state lighting, novel functional materials, and biomedical engineering.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 111 [Min Grade: D] and CHEM 113 [Min Grade: D]

EET 311 Modeling of Engineering Systems 4.0 Credits
Course introduces students to development and application of ordinary differential equations to systems analysis with emphasis on electrical systems. Particular attention is paid to the derivation of differential equations from given practical circuits used in industrial applications.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MATH 122 [Min Grade: D] and EET 202 [Min Grade: D]

EET 313 Signals and Systems I 4.0 Credits
Course introduces students to applications of the systems analysis to the design of useful circuits and devices used in industrial applications. Covers time and frequency domain circuit analysis (transfer function, convolution) to determine response of the system to the arbitrary input.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 311 [Min Grade: D]

EET 317 Analog Electronics II 4.0 Credits
Students are introduced to four-layer diodes, power amplifiers, differential amplifiers, linear and non-linear operational amplifiers, feedbacks, oscillators, and active filters. Class discussions include practical circuits, troubleshooting, and case studies.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 206 [Min Grade: D]

EET 319 PLC Fundamentals 4.0 Credits
Introduces the fundamentals of programmable logic controllers, and PLC application in process control. The course includes both lecture and laboratory aimed at applying fundamental principles to practical projects. The emphasis is on the basics of ladder logic, including timers, counters, and program control.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 205 [Min Grade: D]

EET 320 Renewable Energy Systems 3.0 Credits
This course provides an introduction to energy systems and renewable energy resources, with a scientific examination of the energy field and an emphasis on alternate energy sources and their technology and applications. The class explores society's present needs and future energy demands, examines conventional energy sources and systems, including fossil fuels and then focuses on alternate, renewable energy sources such as solar, wind power, geothermal and fuel cells.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 103 [Min Grade: D] or (PHYS 101 [Min Grade: D]) and PHYS 104 [Min Grade: D] or (PHYS 102 [Min Grade: D] or PHYS 151 [Min Grade: D])

EET 322 Energy Conversion 4.0 Credits
The course covers the fundamentals and the principles of electrical machines and transformers, with an emphasis on their application and installation. The course covers transformer, dc, ac and special machines. Novel energy conversion techniques such as Fuel Cell and Batteries are also discussed.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 202 [Min Grade: D]

EET 323 Electrical Systems Design 3.0 Credits
This course covers the basics of industrial systems, including safety, grounding, protection, lighting, distribution, commonly found in residential, commercial and industrial environment. The course formulates the application of standards and codes such as NEC, NEMA and IEEE.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 202 [Min Grade: D]

EET 324 Power Electronics 4.0 Credits
The course covers the basics of the industrial and power electronics over a spectrum of applications and provides an introduction to the emerging technologies in these fields. The course is accompanied by laboratory using hardware and software simulation tools.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 202 [Min Grade: D]

EET 325 Microprocessors 3.0 Credits
Introduces student to fundamentals of microprocessing using an application-oriented approach. Includs fundamental principles and system requirements supplemented with specific implementation examples and practical circuits with detailed design considerations.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 205 [Min Grade: D]

EET 333 [WI] Non-Destructive Evaluation of Materials 4.0 Credits
The course presents principles of Ultrasound Nondestructive Evaluation (NDE) of Materials combining hands-on laboratory experience with lectures. Students learn the physical principles and fundamentals of ultrasound material characterization. Students also learn industrial applications of NDE techniques and procedures and become familiar with detection and characterization of defects in materials, such as flaws and cracks.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (PHYS 103 [Min Grade: D] or PHYS 101 [Min Grade: D]) and (PHYS 104 [Min Grade: D] or PHYS 102 [Min Grade: D] or PHYS 151 [Min Grade: D])

EET 335 Acoustic Emission 4.0 Credits
The course presents principles of acoustic emission using practical applications in various industries. Physical principles of acoustic emission generation, propagation and detection in engineering materials and structures are presented. This includes principles of stress and strain and the underlying materials science of material deformation, crack growth and failure. Students learn how these principles are utilized to build technical applications of acoustic emission considered as an NDE method.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 103 [Min Grade: D] and PHYS 104 [Min Grade: D]

EET 401 Applied Microcontrollers 4.0 Credits
The course is an introduction to microcontroller hardware and software with an emphasis on embedded control applications. Topics covered include microcontroller architectures, programming, analog and digital input/output, timing, debugging and PC-based software development tools.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 205 [Min Grade: D]

EET 402 Control Engineering 3.0 Credits
The course covers fundamental of control theory and their applications, including, linear systems and feedback, linear system operation and stability, standard methods applicable to the linear systems and basic for designs and applications.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 311 [Min Grade: D] and EET 313 [Min Grade: D]

EET 404 Signals and Systems II 3.0 Credits
Introduces the analysis of electric circuits under steady sinusoidal conditions, applications of Laplace transformation and complex frequency analysis, and Fourier analysis for representing an arbitrary time function as a sum of sinusoidal functions.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 313 [Min Grade: D] and EET 311 [Min Grade: D]

EET 406 Communication Systems 3.0 Credits
This course introduces AET student to fundamentals of Communication Systems using an integrated approach to analog and digital communications. Design and applications of contemporary communication systems are emphasized via the reduction theory to practice.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 311 [Min Grade: D] and EET 313 [Min Grade: D]

EET 407 Power Systems Fundamentals 3.0 Credits
The course covers the basic principles of the power systems, electric grid, methods to analyze electric grid systems and basic power system protection and stability.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 202 [Min Grade: D] and EET 322 [Min Grade: D]

EET 409 Optical System Design 3.0 Credits
This course introduces ET students to fundamentals of optics and optical systems using an application-oriented approach. Special attention is given to fundamental principles of optical systems and their requirements supplemented with specific applications-based examples.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 104 [Min Grade: D]

EET I199 Independent Study in EET 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

EET I299 Independent Study in EET 12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

EET I399 Independent Study in EET 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

EET I499 Independent Study in EET 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

EET T180 Special Topics in EET 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

EET T280 Special Topics in EET 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

EET T380 Special Topics in EET 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

EET T480 Special Topics in EET 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

Engineering Management

Courses

EGMT 230 Introduction to Global Engineering 2.0 Credits
This course introduces the student to a broad range of contemporary issues (economic, political and cultural) that engineers face in meeting the challenges of globalization. This is a discussion focused course and is intended to expose the engineers to concepts and challenges facing today's global engineers. Topics include understanding globalization, communicating across cultures, peace engineering, and developmental engineering. Students in this course will also be asked what it means to be an engineer today and to understand their role and potential for impact. The course will feature guest speakers and students will engage in various case study analysis.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

EGMT 295 Survey of Mentorship 1.0 Credit
This course is the first in the leadership development course sequence, which is part of the Peer Mentor program. This course sequence is designed to develop and enhance the leadership skills among engineering students, emphasizing communication among peer groups and other undergraduate students. As the first course in the sequence, it is focused on the mentor-mentee relationship as it relates to leadership development. Students in this class will be assigned freshman mentees with whom they will be working during the fall term.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

EGMT 296 Survey of Leadership 1.0 Credit
EGMT 296: Survey of Leadership is the second course in the leadership development course sequence which is part of the Peer Mentor program. This course sequence is designed to develop and enhance the leadership skills among engineering students, emphasizing communication among peer groups and other undergraduate students. As the second course in the sequence, EGMT 296: Survey of Leadership builds upon the foundational leadership concepts of trust, communication, and mentorship covered in EGMT 295: Survey of Mentorship. The course also focuses on self-awareness, team dynamics, and emotional intelligence, which is the ability of a person to adapt his or her leadership style based on situational needs.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

EGMT 340 Introduction to the Orbital Perspective 3.0 Credits
Living on the International Space Station is a powerful, transformative experience that can change one's views on our planet and the problems we collectively face. Based upon Astronaut Ron Garan's experiences in space, this course focuses on the importance and possibilities of global collaboration and innovation in creating a better world. Students will learn what it is like to work with a diverse group of people in an environment only a handful of human beings have ever known. Students will also learn to apply the orbital perspective here at home, embracing new partnerships and processes to promote peace and combat hunger, thirst, poverty, and environmental destruction. This course is a call to action for each of us to care for the most important space station of all: planet Earth.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

EGMT 345 Introduction to Peacebuilding for Engineers 3.0 Credits
Developed in partnership with professional peacebuilders from the PeaceTech Lab and USIP's Academy for International Conflict Management and Peacebuilding in Washington DC, this course introduces engineering students to the concepts and skills practiced in the field of international peacebuilding and conflict transformation. This course provides students with first-hand accounts of peacebuilders describing the challenges and opportunities in their work, short presentations outlining key theories and concepts that guide that work, and opportunities to think about how this knowledge, skills, and attitudes can be applied to real-life peacebuilding dilemmas.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

EGMT 350 Conflict Management for Engineers 3.0 Credits
As the pace of science and technology innovation increases, so too does the role of engineers in solving some of the world's toughest challenges. The prevention of violent conflict and the pursuit of a sustainable peace is just such a challenge. Developed in partnership with professional peacebuilders from the PeaceTech Lab and the US Institute of Peace's Academy for International Conflict Management and Peacebuilding in Washington DC, this course introduces engineering students to the concepts and skills they will need in order to use technology expertise in service of conflict-affected communities. This course provides students with an introduction to the theory and practice of conflict analysis, strategic peacebuilding, and negotiation.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

EGMT 404 [WI] Introduction to Engineering Management Communications 3.0 Credits
Excellence in design is as important to managerial communications as it is for any engineering endeavor. By applying this concept to the challenges that new engineering managers face, the course encourages engineers to aspire to professional competence in writing and speaking as they prepare for management. This helps them in both marketing their job skills and publishing and promoting innovative ideas and solutions. Students learn the rhetoric of managerial communication to affect workplace behavior on multiple levels, effect profitable technological and business outcomes, and promote the success of new products and systems. The basic skills of composition and grammar are also stressed: developing and organizing content, building effective reporting formats, and editing to achieve style and correctness.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

EGMT 462 Introduction to Engineering Management 3.0 Credits
Introduces the general theory of management, including the processes of planning, organizing, assembling resources, supervising, and controlling. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

EGMT 465 Introduction to Systems Engineering 3.0 Credits
Determining technical requirements for engineering systems and planning technical product design and requirements. Analyzing the functionality, interoperability, and sustainability of new engineering systems. Integrating disparate engineering components for overall system optimization. Planning for testing and evaluation of engineering systems to evaluate conformance with technical requirements. Planning optimized organizational structure for execution of complex engineering programs.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

EGMT 470 Engineering Leadership Capstone 2.0 Credits
This course aims to improve students' leadership, problem solving, and communications skills through mentorship, scholarship, and civic engagement. It requires students to utilize the skills developed through their degree programs to solve a problem in the local community. Students will then present their solution to the relevant parties at the end of the term.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (EGMT 295 [Min Grade: D] and EGMT 296 [Min Grade: D]) or (ORGB 320 [Min Grade: D] and EGMT 404 [Min Grade: D] and EGMT 462 [Min Grade: D])

EGMT I199 Independent Study in EGMT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

EGMT I299 Independent Study in EGMT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

EGMT I399 Independent Study in EGMT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

EGMT I499 Independent Study in EGMT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

EGMT T180 Special Topics in EGMT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

EGMT T280 Special Topics in EGMT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

EGMT T380 Special Topics in EGMT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

EGMT T480 Special Topics in EGMT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

Engineering, General

Courses

ENGR 081 Engr Common Mtng Time: Frosh 0.0 Credits
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ENGR 100 Beginning Computer Aided Drafting for Design 1.0 Credit
Introduces students to computer-aided graphics techniques and the use of a state-of-the-art, computer-aided design/drafting package. Students will learn 2-D and 3-D modeling techniques to support the design process. All students will be required to take a competency quiz on 4 of 6 available AutoCAD labs.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

ENGR 101 Engineering Design Laboratory I 2.0 Credits
This course introduces students to engineering design and practice. Emphasis is placed on the synthesis of knowledge, skills and the methodologies that are the heart of the profession. The course is designed to integrate core scientific foundations into an engineering perspective through the use of team-based projects, computer tools and technical writing. This is the first part of the three term freshman design experience.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

ENGR 102 Engineering Design Laboratory II 2.0 Credits
This course introduces students to engineering design and practice. Emphasis is placed on the synthesis of knowledge, skills and the methodologies that are the heart of the profession. The course is designed to integrate core scientific foundations into an engineering perspective through the use of team-based projects, computer tools and technical writing. This is the second part of the three term freshman design experience.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

ENGR 103 Engineering Design Laboratory III 2.0 Credits
This course introduces students to engineering design and practice. Emphasis is placed on the synthesis of knowledge, skills and the methodologies that are the heart of the profession. The course is designed to integrate core scientific foundations into an engineering perspective through the use of team-based projects, computer tools and technical writing. This is the third part of the three term freshman design experience.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

ENGR 104 Engineering Design Laboratory for Transfers 4.0 Credits
Individualized course specially designed for transfer students. Provides selected educational experiences in engineering design, experimental techniques, and computer skills to round out the student's previous course of study.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

ENGR 111 Introduction to Engineering Design & Data Analysis 3.0 Credits
This course introduces students to engineering design and concepts in data collection, analysis, modeling, and presentation that are central to all fields of engineering. Students will gain exposure to a variety of engineering disciplines through introduction of problems and experiments from different fields.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Corequisite: EXAM 080

ENGR 113 First-Year Engineering Design 3.0 Credits
In this course, students will focus on applying the engineering design process to problems of particular interest in the various engineering fields. A key component of the course is a term-long project where students will work in teams to solve an engineering problem.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ENGR 111 [Min Grade: D]

ENGR 121 Computation Lab I 2.0 Credits
Introduces computation and programming through the use of a
mathematical computation system, such as MATLAB. Programming
techniques and algorithmic problem solving are introduced in the context
of data analytics, basic calculus, modeling, simulation, and visualization.
The course also illustrates the strengths and limitations of the scientific
software in solving mathematical, engineering and scientific problems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

ENGR 122 Computation Lab II 1.0 Credit
Introduces physics-based simulations through the use of a mathematical
computation system, such as MATLAB. Mathematical modeling and
simulation of physical processes (static and dynamic) are used as a
platform for numerical integration and differentiation.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ENGR 121 [Min Grade: D]

ENGR 124 Computational Problem-Solving 3.0 Credits
This course sequence introduces computation and programming through
the use of a mathematical computation system. Programming techniques
and algorithmic problem solving are introduced in the context of data
analytics, basic calculus, visualization, physics based modeling and
simulations. The course also illustrates the strengths and limitations of
the scientific software in solving mathematical, engineering and scientific
problems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

ENGR 131 Introductory Programming for Engineers 3.0 Credits
An introduction to the fundamentals of programming and algorithmic
problem solving with applications in engineering. Emphases include (a)
producing clear, robust, and efficient code, and (b) conceptualizing and
designing computational algorithms to solve engineering problems. Upon
completion, students will possess the programming skills necessary to
perform computational analysis in any engineering discipline. This course
is designed for students without any prior programming experience.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Corequisite: EXAM 080

ENGR 132 Programming for Engineers 3.0 Credits
An introduction to the fundamentals of programming and algorithmic
problem solving with applications in engineering. Emphases include (a)
producing clear, robust, and efficient code, and (b) conceptualizing and
designing computational algorithms to solve engineering problems. Upon
completion, students will possess the programming skills necessary to
perform computational analysis in any engineering discipline. This course
is designed for students with some high-school Computer Science or
programming experience in any language.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

ENGR 170 Pre-Calculus Practicum 1.0 Credit
The Pre-calculus Practicum for Engineers is designed to promote
excellence in mathematics, team-based approaches to working and
learning, and an appreciation for how mathematics is connected with
the discipline. Since mathematics is the language of engineering, it is
important to master its core concepts at an early stage and to develop
the habits of mind required for effective problem solving. Through
individual drills, small-group problem sets, and in-class discussion we will
reinforce concepts taught in the freshman mathematics sequence and
improve fluency with the approaches and strategies linked to a culture of
excellence within the discipline.
College/Department: College of Engineering
Repeat Status: Can be repeated 1 times for 2 credits
Restrictions: Cannot enroll if classification is Junior or Pre-Junior or
Sophomore or Senior

ENGR 199 Preparation for the Engineering Studies 6.0 Credits
Preparation for the Engineering Core Curriculum through intensive,
coordinated work in three areas: pre-calculus mathematics, effective
study methods, and career evaluation and selection. Topics include:
algebra, trigonometry, geometry, note-taking, exam preparation, time
management, evaluation of engineering and other career paths. (This
course does not count toward graduation requirements).
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

**ENGR 201 Evaluation & Presentation of Experimental Data I 3.0
Credits**
Provide a comprehensive introduction to analysis, presentation, and
communication of data collected by the engineer. Requires students
to conduct experiments on engineering systems, then process and
evaluate the collected data. Required presentation of research, results,
conclusions, and conjectures from a technical and ethical viewpoint.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 122 [Min Grade: D] and PHYS 101 [Min Grade: D]
and ENGR 103 [Min Grade: D]
Corequisite: EXAM 081

**ENGR 202 Evaluation & Presentation of Experimental Data II 3.0
Credits**
A continuation of ENGR 201.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGR 201 [Min Grade: D]
Corequisite: EXAM 081

ENGR 210 Introduction to Thermodynamics 3.0 Credits
Introduces thermodynamics from a classical point of view. Covers work,
heat, entropy, thermodynamic properties, equations of state, and first and
second law analysis of closed systems, control volumes, and selected
thermodynamic cycles.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 122 [Min Grade: D] and PHYS 101 [Min Grade: D]
Corequisite: EXAM 081

ENGR 220 Fundamentals of Materials 4.0 Credits
Introduces materials and their properties; atomic view and architecture of solids; atomic motion in solids, mechanical, magnetic, electrical and optical properties of materials. Corrosion and degradation of solids.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 101 [Min Grade: D] and MATH 122 [Min Grade: D] and PHYS 101 [Min Grade: D]
Corequisite: EXAM 081

ENGR 231 Linear Engineering Systems 3.0 Credits
Provides an overview of systems and modeling; specifically using linear algebra as the model. Specific emphasis will be placed on developing models of engineering systems and the use of computational tools for solutions of the problems. The focus of the lab will be the use of MATLAB for solution of contemporary engineering problems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MATH 122 [Min Grade: D]
Corequisite: EXAM 081

ENGR 232 Dynamic Engineering Systems 3.0 Credits
Provides an overview of dynamic systems and modeling; specifically using differential equations as a model. Specific emphasis will be placed on developing models of dynamic systems and the use of computational tools for solutions of the problems. The focus of the lab will be the use of MATLAB for solution of contemporary engineering problems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ENGR 231 [Min Grade: D]
Corequisite: EXAM 081

ENGR 280 Introduction to Global Engineering 2.0 Credits
Introduces students to a broad range of contemporary issues (economic, political, and cultural) engineers face in meeting the challenges of globalization. In addition to responding to weekly presentations, students will engage in and report on an in-depth case study.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

ENGR 361 Statistical Analysis of Engineering Systems 3.0 Credits
Probability, random variables, reliability, quality control, design of experiments, regression/correlation, ANOVA and related topics, hypothesis testing.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

ENGR 370 Vertically Integrated Projects 0.0-4.0 Credits
The Vertically-Integrated Projects (VIP) Program will operate in a research and development context. Undergraduate students who join VIP teams will earn academic credit for their participation in design/discovery efforts that assist faculty and graduate students with research and development issues in their areas of expertise. Permission of the instructor required.
College/Department: College of Engineering
Repeat Status: Can be repeated 9 times for 40 credits

ENGR 491 Senior Project Design I 2.0 Credits
Introduces the design process, including information retrieval, problem definition, proposal writing, patents, and design notebooks. Includes presentations on problem areas by experts from industry, government, and education.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENGR 492 Senior Project Design II 2.0 Credits
Continues ENGR 491. Requires written and oral progress reports.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CIVE 491 [Min Grade: D]

ENGR 493 Senior Project Design III 4.0 Credits
Continues ENGR 492. Requires written and oral final reports, including oral presentations by each design team at a formal Design Conference open to the public and conducted in the style of a professional conference.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENGR I199 Independent Study in ENGR 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ENGR I299 Independent Study in ENGR 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ENGR I399 Independent Study in ENGR 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ENGR I499 Independent Study in ENGR 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ENGR T180 Special Topics in ENGR 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ENGR T280 Special Topics in ENGR 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ENGR T380 Special Topics in ENGR 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ENGR T480 Special Topics in ENGR 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

English

Courses

ENGL 101 Composition and Rhetoric I: Inquiry and Exploratory Research 3.0 Credits
Develops students' abilities to use writing as a tool for inquiry. Introduces genre theory, writing as a process, revision, and strategies of primary and secondary research. Reviews grammar, style, and documentation conventions. Engages students in reflection and promotes positive attitudes toward writing.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENGL 102 Composition and Rhetoric II: Advanced Research and Evidence-Based Writing 3.0 Credits
Advances students' development in the writing processes. Promotes a critical evaluation and integration of information into their own writing as they research complex and open-ended issues. Identifies the relationships between rhetorical situations, the status of claims, and the need for evidence and warrants. Continues review of grammar, style, and documentation conventions. Encourages collaboration and effective search strategies of the Internet and library resources. Promotes students' reflective analysis and a positive attitude toward writing.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

ENGL 103 Composition and Rhetoric III: Themes and Genres 3.0 Credits
Advances students' development in the writing and research processes and their understanding of how genres of writing shape meaning. Some courses may focus on the student's academic and discipline-specific experiences; Others may be based on literary or social themes. Promotes a critical reading of texts, reflective analysis, and a positive attitude toward writing.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 102 [Min Grade: D]

ENGL 105 Honors Freshman English 3.0 Credits
Develops students' abilities to read and write expository and persuasive academic discourse. Teaches students the components of the writing process and strategies to think and read critically and to present a written argument. Requires students to write expository and persuasive essays and research papers and to keep a journal to express their responses to the material read and studied in the course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is HONR.

ENGL 111 English Composition I 3.0 Credits
Equivalent to the university requirement of ENGL 101. Develops multilingual (non-native speakers of English) students' abilities to use writing as a tool for research and reflection. Introduces the concept of genre, writing as a process, reflection on students' own and others' work, revision, and approaches to primary and secondary research. Reviews grammar, organization, style, and documentation conventions. Promotes positive attitudes toward writing.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: APE 2 or ESL 110 [Min Grade: D]

ENGL 112 English Composition II 3.0 Credits
Equivalent to the university requirement of ENGL 102. Advances multilingual (non-native speakers of English) students' abilities to use of writing as a tool for research and reflection and their understanding of writing as a process. Develops the critical evaluation and integration of information into students' own writing as they research social, political, and educational open-ended issues. Continues review of grammar, organization, style, and documentation conventions. Enhances effective strategies for secondary research and collaboration skills. Promotes positive attitude towards writing.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 111 [Min Grade: D]

ENGL 113 English Composition III 3.0 Credits
Equivalent to the university requirement of ENGL 103. Advances multilingual (non-native speakers of English) students' development in the reading, writing, and research processes. Some courses may focus on the student's academic and discipline-specific experiences, while others may be based on literary or social themes. Enhances multilingual students' ability to read texts critically and to reflect on their own and others' writing, scholarly and literary works, and social events. Promotes a positive attitude toward writing.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 112

ENGL 195 English Freshman Seminar 3.0 Credits
This course introduces freshman majors to the practice and study of the English major. It is a foundation for further study as well as a course about how we learn. It prepares the student to be successful in upper-division courses and to become familiar with the basic tools of the discipline. It encourages the creative and critical thinking that is a hallmark of the English major.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENGL 200 [WI] Classical to Medieval Literature 3.0 Credits
A survey of Greek and Roman literature (Homer, Aeschylus, Euripides, Virgil and Cicero), up to and including the Medieval period (Aquinas, Cavalcanti, Chaucer, and Dante). This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 201 Renaissance to the Enlightenment 3.0 Credits
A survey of Western literature from the Renaissance to the
Enlightenment, focusing on works by Cervantes, Erasmus, Rabelais,
Petrarch, Voltaire, Rousseau, Swift and Pope.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or
ENGL 105 [Min Grade: A]

ENGL 202 [WI] Romanticism to Modernism 3.0 Credits
A survey of Western literature of the 19th and 20th centuries focusing on
the major periods of Romanticism (Blake, Coleridge and Keats), Realism
(Balzac and Ibsen), and Modernism (Kafka, Borges and Woolf). This is a
writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or
ENGL 105 [Min Grade: A]

ENGL 203 [WI] Survey of World Literature 3.0 Credits
A survey of nonwestern literatures produced before the modern era in
Asia, Africa, and the Middle East, representing the more important periods
and genres. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or
ENGL 105 [Min Grade: A]

ENGL 204 Post-Colonial Literature 3.0 Credits
A survey of nonwestern literatures written since the 20th century by
writers from Asia, Africa, and the Middle East, and focusing on the effects
of social, aesthetic and contemporary events on artistic creation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or
ENGL 105 [Min Grade: A]

ENGL 205 [WI] American Literature I 3.0 Credits
A survey of American literature from Colonial times through the Civil War,
including works by such writers as Anne Bradstreet, Emily Dickinson,
Frederick Douglass, Cotton Mather, Ralph Waldo Emerson, Nathaniel
Hawthorne, Herman Melville, Henry David Thoreau and Walt Whitman.
This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or
ENGL 105 [Min Grade: A]

ENGL 206 [WI] American Literature II 3.0 Credits
A survey of American literature from the Civil War through the 21st
century, including works by such writers as Kate Chopin, W.E.B. Du Bois,
T.S. Eliot, William Faulkner, F. Scott Fitzgerald, Henry James, Philip Roth,
Mark Twain and John Updike. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or
ENGL 105 [Min Grade: A]

ENGL 207 [WI] African American Literature 3.0 Credits
Introduces students to African-American Literature, from the mid-18th
century to the present. Provides a basic understanding of social, political
and cultural influences and an awareness of the African-American literary
tradition. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or
ENGL 105 [Min Grade: A]

ENGL 211 [WI] British Literature I 3.0 Credits
A historical survey of British literature from its beginning to the end of the
eighteenth century. Students will read texts selected to represent major
authors, forms and thematic material that illustrates the development of
English literature through the medieval and Renaissance periods and
seventeenth and eighteenth centuries. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or
ENGL 105 [Min Grade: A]

ENGL 212 British Literature II 3.0 Credits
A historical survey of British literature from the turn of the nineteenth
century to the present; students will read texts selected to represent
major authors, forms and thematic material of the Romantic, Victorian and
modern periods.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or
ENGL 105 [Min Grade: A]

ENGL 214 Readings in Fiction 3.0 Credits
A basic course, which focuses on fiction as a genre through the study of
a variety of short stories and fiction, organized by theme, period or form.
One of three genre courses.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or
ENGL 105 [Min Grade: A]

ENGL 215 [WI] Readings in Poetry 3.0 Credits
A basic course which focuses on poetry as a genre through the study of a
variety of poems organized by theme, period or form. One of three genre
courses. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or
ENGL 105 [Min Grade: A]

ENGL 216 [WI] Readings in Drama 3.0 Credits
A basic course which focuses on drama as a genre through the study of
a variety of plays organized by theme, period or form. One of three genre
courses. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 220 LGBT Literature and Culture 3.0 Credits
This course examines writing in English by lesbian, gay, bisexual, transgender (LGBT), and sexual minority authors. Learning from LGBT literature in a variety of forms and genres will help students cultivate sophisticated knowledge about sexual orientation, gender identity and expression, homoeroticism and homophobia, HIV/AIDS, the relationship of art and politics, and the intersections of sexuality, gender, race, class, and nation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 300 [WI] Literature & Science 3.0 Credits
This course studies the impact of scientific and technological change on works of literature and art produced in various historical periods. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 301 English Major Colloquium 1.0 Credit
This 1-credit variable topics course for English majors explores specialized issues in literature and writing such as: an author or major work; a significant moment in the history of writing, literature, or criticism; or a controversial or debated issue in writing or literary studies. English majors must take 3 different ENGL 301 colloquium topics as part of their major requirements.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 5 times for 6 credits
Prerequisites: ENGL 195 [Min Grade: D]

ENGL 302 Environmental Literature 3.0 Credits
This course explores the relatively recent discipline of Ecocriticism and considers the literary relationship between human beings and the natural environment--both altered and unaltered by human activity. The approach is interdisciplinary in its investigation of the relationships among science, culture, and personal observation. Students will read a selection of seminal texts of American environmental literature.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 303 Science Fiction 3.0 Credits
Provides reading and discussion of works illustrating the development of modern science fiction.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 304 Young Adult Fiction 3.0 Credits
This course introduces students to young adult (YA) fiction and to secondary sources useful for the appreciation of it. Topics discussed include: young adults as an audience, the genres of YA fiction, keeping up with YA fiction, literary and psychological theory applied to YA fiction.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 305 [WI] The Mystery Story 3.0 Credits
A study of the mystery story, from its inception as a genre in the 19th century to the present, through short stories and novels. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 306 Literature of Baseball 3.0 Credits
An examination of novels, short stories, and poetry about our "national pastime" that illuminate American ideals and values, history and culture from 1845 to the present. A study of how the game's symbols and rituals, its history and mythology help us understand American belief systems and ideologies.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 307 Literature of Genocide 3.0 Credits
Genocide is defined as "acts committed with intent to destroy, in whole or in part, a national, ethnical, racial or religious group" (U. N. Office on Genocide Prevention). This course will feature literature, film, and articles, by survivors themselves, historians and other writers, about major genocides and their perpetrators. Topics may include cases from any part of the world or century up to the present.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 1 times for 6 credits
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 308 [WI] The Literature of Business 3.0 Credits
In this advanced reading course, students read literary works about business and work and write analytically about these works, grounding that analysis in nonfiction readings from business publications. Course writing assignments ask students to respond to problems and issues raised in the texts. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: (ENGL 101 [Min Grade: D] and ENGL 102 [Min Grade: D] and ENGL 103 [Min Grade: D]) or ENGL 105 [Min Grade: A]

ENGL 310 [WI] Period Studies 3.0 Credits
This is a variable topics course, focusing on the literature of a particular period (i.e., Classical Literature; Victorian Literature; the Harlem Renaissance). May be repeated for credit. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 312 Research Project Development 1.0-3.0 Credit
A seminar-style course in which students work on a research or creative project of their own choosing. They acquire knowledge and skills related to the development of researchable original ideas in the domains of humanities areas like literature and philosophy, or social science areas like communication, history or psychology, or a creative work or portfolio.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 12 credits
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D]

ENGL 315 [WI] Shakespeare 3.0 Credits
This course focuses on Shakespeare's major plays and sonnets, providing the historical and cultural contexts that gave rise to his work. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 320 [WI] Major Authors 3.0 Credits
A course focused on intensive study of one or more authors, for example: Jane Austen; Joseph Conrad; Hemingway, Faulkner and Fitzgerald; Writers of the Harlem Renaissance; Carlos Fuentes and Gabriel Garcia Marquez. May be repeated for credit. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 1 times for 6 credits
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 323 Literature and Other Arts 3.0 Credits
A variable topics course which studies relationships between literature and one or more of the visual arts, theater or music (i.e., Surrealism; Memoir and Documentary Film; The Faust Legend). May be repeated for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 1 times for 6 credits
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: D]

ENGL 325 Topics in World Literature 3.0 Credits
A variable topics course which focuses on a particular national or regional literature within its cultural, historical and political contexts (i.e., African Literature; French Literature; Latin American Literature). May be repeated for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 1 times for 6 credits
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 330 The Bible as Literature 3.0 Credits
This course provides a close reading of selected books of the Old and New Testaments alongside selected literary works to discover both the literary qualities of these texts and their influence on literature.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 335 Mythology 3.0 Credits
This course investigates the specific forms mythological stories have taken in the literature, art and ritual of some or all of the following: Greece, Rome, Iceland, Mesopotamia and Native American and European cultures in the United States.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 340 [WI] Classical Rhetoric 3.0 Credits
A study in the theory and practical application of Greek and Roman rhetorical strategies in composition. Focuses on influential figures, terminology, the five canons, and the ancient composition processes known as "progymnasmata" to look at historical texts, the rhetoric of popular media, and the students' writing. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 101 [Min Grade: D] and ENGL 102 [Min Grade: D]

ENGL 345 American Ethnic Literature 3.0 Credits
A variable topics course which studies the literature of one or more of the United States ethnic populations within their historical and cultural contexts. May be repeated for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 350 Jewish Literature and Civilization 3.0 Credits
Focuses on the Jewish Bible, a classic literary document of Western civilization, deemed by many people of the world as fundamental to their religion; stresses aspects of cultural diversity and awareness.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 355 [WI] Women and Literature 3.0 Credits
This course focuses on literature written by, and/or about women and considers issues relating to women's place in literary history. May be repeated for credit. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 360 [WI] Literature and Society 3.0 Credits
This course examines the relationship between literature and the society it reflects and helps shape. May be repeated for credit. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 365 Topics in African American Literature 3.0 Credits
A variable topics course designed to further develop the ideas first presented in the African American Literature survey by exploring, in much more depth, significant authors, periods, and genres within the African American literary and cultural tradition. Topics include Science and Technology in African American Literature; the Slave Narrative; and Black Travel Writing.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 2 times for 6 credits
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 370 Topics in Literature and Medicine 3.0 Credits
This is a variable topics course which focuses on aspects of illness, healing, care-giving, aging, grief, and mortality as presented in narrative. Exploration of how literary construction and analysis affect understanding of these experiences. Topics include ?Illness and Healing in Literature and The Physician in Literature and Film. May be repeated three times for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 9 credits

ENGL 380 Literary Theory 3.0 Credits
This course examines literary theoretical thinking, and focuses on twentieth century structuralism, post-structuralism, and contemporary theory. We will examine the ways in which language is conceived and reconceived by major theoretical writers and the implications of this rethinking for conceptualizations of history, politics, ideology, sexuality, and trauma, among others.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ENGL.
Cannot enroll if classification is Freshman or Sophomore
Prerequisites: (ENGL 101 [Min Grade: C] or ENGL 111 [Min Grade: C]) and (ENGL 102 [Min Grade: C] or ENGL 112 [Min Grade: C]) and (ENGL 202 [Min Grade: C] or ENGL 203 [Min Grade: C] or ENGL 204 [Min Grade: C] or ENGL 205 [Min Grade: C] or ENGL 206 [Min Grade: C] or ENGL 211 [Min Grade: C] or ENGL 212 [Min Grade: C] or ENGL 214 [Min Grade: C])

ENGL 395 [WI] Special Studies in Literature 0.0-3.0 Credits
This is a variable topics course, providing intense literary study on a specific theme. May be repeated for credit. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 470 Capstone Seminar in Medical Humanities 3.0 Credits
This seminar gives students the opportunity to synthesize, contextualize, and deepen their understanding of how disciplines in the humanities and the social sciences approach the experiences and implications of illness, aging, mortality and healing. Regular guest lecturers, discussion of assigned readings, student presentations, and written projects.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CMDH.
Prerequisites: (ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: D]) and HUM 315 [Min Grade: B]

ENGL 490 Seminar in English and American Literature 3.0 Credits
An advanced course with variable topics in British or American Literature stressing textual analysis, cultural and historical contexts and research; provides students with intensive preparation for advanced and professional studies.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 2 times for 9 credits
Restrictions: Can enroll if major is ENGL and classification is Junior or Senior.

ENGL 492 Seminar in World Literature 3.0 Credits
An advanced course with variable topics in World Literature stressing textual analysis, cultural and historical contexts and research; provides students with intensive preparations for advanced and professional studies.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 2 times for 9 credits
Restrictions: Can enroll if major is ENGL and classification is Junior or Senior.

ENGL 495 Senior Project in Literature 3.0 Credits
Open to English Majors only, the senior project in literature should reflect the student's interest in a specific subject, author or theme and should demonstrate the student's research, critical and analytical expertise at an advanced, pre-professional level.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ENGL.

ENGL I199 Independent Study in ENGL 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENGL I299 Independent Study in ENGL 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENGL I399 Independent Study in ENGL 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENGL I499 Independent Study in ENGL 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENGL T180 Special Topics in English 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENGL T280 Special Topics in English 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENGL T380 Special Topics in English 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENGL T480 Special Topics in English 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

English as a Second Language

Courses

ESL 001 Foundations of University Study 0.0 Credits
High intermediate to advanced English as a second language course. This course provides ESL students with a foundation for University success through developing academic communication skills and strategies and promoting awareness of the academic and co-curricular culture of the American university.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 1 times for 15 credits
Restrictions: Can enroll if major is ESL or major is IG.

ESL 002 Foundations of Academic Writing 0.0 Credits
This course introduces ESL students to the academic essay and the process approach to writing as well as reading for different purposes.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 003 Foundations of Academic Reading 0.0 Credits
This course introduces ESL students to the skills of critical reading for information, specifically summarizing and evaluating source material.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 004 International Gateway Foundations of Academic Writing for Chemistry 201 0.0 Credits
This course provides International Gateway students with support for success in the CHEM 201 course through developing academic skills and strategies to participate in the sciences.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 010 Listening and Speaking I 0.0 Credits
Low beginning English as a second language. Provides intensive instruction in the development of the following skills: speaking and listening in everyday situations, vocabulary, pronunciation, and grammatical functions. Placement testing is required. Offered all terms. 7.5-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 011 Reading and Writing I 0.0 Credits
Low beginning English as a second language. Provides intensive instruction in the development of the following skills: reading comprehension, simple inferring, basic vocabulary development, sentence and paragraph writing, basic grammatical structures, and the ability to communicate ideas orally and in writing. Placement testing is required. Offered all terms. 7.5-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 012 English in Everyday Life 0.0 Credits
Low beginning English as a second language. Prepares students who have trouble talking with and understanding native English speakers in everyday situations such as going to the store or the bank, asking for directions, using the telephone, etc. Placement testing is required. Offered all terms. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 013 Beginning Grammar 0.0 Credits
Beginning English as a second language. Provides instruction and practice in such areas of English grammar as simple verb tenses, sentence structure, modals, and irregular verbs. Placement testing is required. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL.

ESL 020 Listening and Speaking II 0.0 Credits
High beginning English as a second language. Provides intensive instruction in the development of the following skills: speaking and listening (participating actively in spoken interactions and responding appropriately), vocabulary related to topics in the course, pronunciation and intonation patterns, and grammatical functions. Placement testing is required. Offered all terms. 7.5-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 021 Reading and Writing II 0.0 Credits
High beginning English as a second language. Provides intensive instruction in the development of the following skills: reading comprehension, inferring, vocabulary development, non-academic paragraph writing, basic grammatical structures and mechanics, and the ability to communicate ideas orally and in writing. Placement testing is required. Offered all terms. 7.5-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 022 Pronunciation and Conversation 0.0 Credits
High beginning to low intermediate English as a second language. Emphasizes vocabulary, pronunciation, and idioms. Gives students a chance to improve and practice their spoken communication skills. Placement testing is required. Offered all terms. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 023 Intermediate Grammar III 0.0 Credits
Low intermediate English as a second language course. Provides instruction and practice in such areas as present, past, and future tense verbs, question structures, nouns and pronouns, and modals. Placement testing is required. Offered as needed. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 024 Presentations with Stories & Legends 0.0 Credits
Beginning to low intermediate. English as a second language. Provides instruction and practice in reading comprehension, writing, listening, and presentations using stories from a variety of sources. Placement testing is required.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL.

ESL 030 Listening and Speaking III 0.0 Credits
Low intermediate English as a second language. Provides intensive instruction in the development of the following skills: pronunciation (sounds, stress, intonation), vocabulary, listening/speaking (participating and responding appropriately in discussions, following directions, completing listening activities), grammatical competence, and repair of communication breakdown. Placement testing is required. Offered all terms. 7.5-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 031 Reading and Writing III 0.0 Credits
Low intermediate English as a second language. Provides intensive instruction in the development of the following skills: reading comprehension, inferring, vocabulary development, academic paragraph and essay format, grammatical structures and mechanics, and the ability to communicate ideas orally and in writing. Placement testing is required. Offered all terms. 7.5-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 032 English for Business Purposes 0.0 Credits
Intermediate English as a second language. Provides communication skills needed to do business with English speakers. Topics include small talk and telephone skills, participation in business meeting, presentations, communication through business letters and memos, and business negotiation. Placement testing is required. Offered all terms. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 034 Understanding the News Media 0.0 Credits
Intermediate to advanced English as a second language. Emphasizes listening, discussion, and reading skills as students learn to read newspaper articles and listen to news from a variety of sources. Provides instruction on how the news is made and evaluated. Placement testing is required.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL.

ESL 035 Intermediate Vocabulary Development 0.0 Credits
Intermediate English as a second language course. Provides strategies to improve academic, general, and technical vocabulary; to discover common roots in English words; and to improve reading skills. Placement testing is required. Offered all terms. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 036 TOEFL iBT Listening & Speaking 0.0 Credits
High intermediate to advanced English as a second language. Prepares students to take the Internet-based TOEFL (Test of English as a Foreign Language) for academic purposes. Provides instruction in the listening and speaking sections of the TOEFL. Placement testing is required.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 1 times for 6 credits
Restrictions: Can enroll if major is ESL or major is IG.

ESL 037 Intermediate Grammar IV 0.0 Credits
High intermediate English as a second language course. Provides instruction and practice in such areas as comparative structures, passive voice, gerunds and infinitives, and clause structures. Placement testing is required. Offered as needed. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 038 Intermediate Exploring American Life & Language 0.0 Credits
Intermediate English as a second language course. Students evaluate aspects of United States culture and history as presented in selected drama, literature, and music. Additional presentations and writing assignments support development of fluency in speaking and writing skills. Placement testing for this course is required. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 040 Listening and Speaking IV 0.0 Credits
High intermediate English as a second language. Provides intensive instruction in the development of the following skills: pronunciation/fluency (sounds, stress, intonation, linking, phrasing), vocabulary, listening/speaking (participate appropriately in spoken interactions, understand news, mini-lectures), repair of communication breakdown, and grammatical competence. Placement testing is required. Offered all terms. 7.5-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 041 Reading and Writing IV 0.0 Credits
High intermediate English as a second language. Provides intensive instruction in the development of the following skills: reading comprehension, inferring, vocabulary development, academic essay format, grammatical structures and mechanics, and the ability to communicate ideas orally and in writing. Placement testing is required. Offered all terms. 7.5-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 042 Advanced Grammar V 0.0 Credits
Low advanced English as a second language course. Provides instruction and practice in such areas as usage of advanced verb tenses, subject-verb agreement, pronouns, and modals. Placement testing is required. Offered all terms. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 043 Intermediate Presentation Skills 0.0 Credits
Intermediate English as a second language course. Provides instruction on preparing, delivering, and evaluating presentations. Explores ways to engage audience and improve performance. Builds confidence through speaking skill development. Placement testing is required. Offered all terms. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 044 Skills for College Success 0.0 Credits
High intermediate to advanced English as a second language. Addresses academic skills topics such as listening to lectures and note taking, reading textbooks and synthesizing information, conducting research, and expanding awareness of the United States academic environment. Placement testing is required. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 1 times for 6 credits
Restrictions: Can enroll if major is ESL or major is IG.

ESL 045 TOEIC Preparation 4-6 0.0 Credits
High intermediate to advanced English as a second language. Introduces skills and strategies that are helpful in taking the TOEIC test. Improves listening and reading comprehension skills. Focuses on analyzing types of test questions commonly asked and learning strategies for answering the questions. Placement testing is required. Offered all terms. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 048 TOEFL iBT Reading & Writing 0.0 Credits
High Intermediate to advanced English as a second language. Prepares students to take the Internet Based TOEFL (Test of English as a Foreign Language) for academic purposes. Provides instruction in the reading and writing sections of the TOEFL. Placement testing is required.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 049 Intermediate Pronunciation and Conversation 0.0 Credits
Intermediate English as a second language course. Provides instruction on pronunciation, word stress, and intonation. Gives students a chance to improve and practice their spoken communication skills. Placement testing is required. Offered all terms. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 050 Listening and Speaking V 0.0 Credits
Low advanced English as a second language. Provides intensive instruction in the development of the following skills: pronunciation/fluency (ease, speed, smoothness of speaking), vocabulary, listening/speaking (participate appropriately in spoken interactions, understand news reports, lectures), repair of communication breakdown, and grammatical competence. Placement testing is required. Offered all terms. 7.5-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 051 Reading and Writing V 0.0 Credits
Low advanced English as a second language. Provides intensive instruction in the development of the following skills: reading comprehension, inferring, vocabulary development, academic essays and the use of source material, grammatical structures and mechanics, and the ability to communicate effectively in writing. Placement testing is required. Offered all terms. 7.5-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 052 Advanced Vocabulary Development 0.0 Credits
Advanced English as a second language course. Provides strategies to improve academic, general, and technical vocabulary; to discover common roots in English words; and to improve reading skills. Placement testing is required. Offered all terms. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 055 Strategies for Academic Reading 0.0 Credits
Advanced English as a second language. Improves reading comprehension. Provides skills for defining and identifying main and supporting ideas, recognizing transitional words and their role in meaning, and finding organizational patterns. Explores the authors' purpose, opinion, and tone. Placement testing is required. Offered as needed. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 056 GMAT Preparation 5-6 0.0 Credits
Advanced English as a second language. Provides instruction for GMAT reading. Offers strategies to identify key parts of an argument and reviews grammatical and stylistic rules in the sentence correction section. Analyses arguments. Provides instruction for essay writing. Placement testing is required. Offered as needed. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 057 Advanced Vocabulary and Idioms 0.0 Credits
Advanced English as a second language. Provides strategies to improve idiomatic language using authentic sources from a variety of media. Placement testing is required.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 058 Advanced Exploring American Life & Language 0.0 Credits
Advanced English as a second language course. Students evaluate aspects of United States culture and history as presented in selected drama, literature, and music. Additional presentations and writing assignments support development of fluency in speaking and writing skills. Placement testing for this course is required. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 060 Listening and Speaking VI 0.0 Credits
Advanced English as a second language. Provides intensive content-based instruction in the development of the following skills: pronunciation/fluency (ease, speed, smoothness of speaking), vocabulary, listening/speaking (participate appropriately in spoken interactions, understand news reports, lectures), grammatical competence, repair of communication breakdown. Placement testing is required. Offered all terms. 7.5-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 061 Reading and Writing VI 0.0 Credits
Advanced English as a second language. Provides intensive instruction in the development of the following skills: reading comprehension, inferring, academic writing (including research paper with synthesis, summary, reaction, analysis, and citation of sources), grammar and mechanics, and effective communication in writing. Placement testing is required. Offered all terms. 7.5-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 062 TOEFL iBT for All Skills 0.0 Credits
High intermediate to advanced English as a second language. Prepares students to take the iBT (Internet Based Test of English as a Foreign Language) for academic purposes. Provides instruction in the listening, speaking, reading, and writing sections of the TOEFL. Placement testing is required.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 2 times for 12 credits
Restrictions: Can enroll if major is ESL or major is IG.

ESL 063 Advanced Grammar VI 0.0 Credits
High advanced English as a second language course. Provides instruction and practice in such areas as usage of passive tense, noun clauses, adjective clauses, gerunds and infinitives, and conditional sentences. Placement testing is required. Offered all terms. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 064 Advanced Presentation Skills 0.0 Credits
Advanced English as a second language course. Provides instruction on preparing, delivering, and evaluating presentations. Explores ways to engage audience and improve performance. Builds confidence through speaking skill development. Placement testing is required. Offered all terms. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 067 Language of Science Technology Engineering and Mathematics 0.0 Credits
High intermediate to advanced English as a second language course. Provides instruction on building academic vocabulary, reading, and oral skills by incorporating authentic materials from a variety of STEM (Science, Technology, Engineering & Math) fields.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 068 Language of Media and Design 0.0 Credits
High Intermediate-Advanced Listening & Speaking. Develops English as a second language communicative fluency in design-related concepts and vocabulary through the use of authentic materials and experiences.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 1 times for 0 credits

ESL 069 Advanced Pronunciation and Conversation 0.0 Credits
Advanced Intermediate English as a second language course. Provides instruction on pronunciation, word stress, and intonation. Gives students a chance to improve and practice their spoken communication skills. Placement testing is required. Offered all terms. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 070 GLOBE Business Information 0.0 Credits
Intermediate to advanced level English as a second language. Develops students' ability to read business material, understand key vocabulary and discuss current events in the business sector. Provides instruction in reading and understanding case studies. Placement testing is required. Offered as needed. 7.5-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 071 GLOBE Business Communication 0.0 Credits
Intermediate to advanced level English as a second language. Improves students' ability to effectively communicate in business setting. Offers strategies for negotiation and provides instruction on cross-cultural communication styles. Placement testing is required. Offered as needed. 7.5-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 072 Business Site Visits 0.0 Credits
Intermediate to advanced level English as a second language. Prepares students to observe American business practices on site. Develops research skill. Provides instructions and practice in organizing and making presentations as well as letter writing skills. Placement testing is required. Offered as needed. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 073 Introduction to Business Research 0.0 Credits
High-intermediate to advanced level English as a second language. Introduces students to the research process of business related topics and exposes them to American culture and conversation through interaction. Offered as needed. 7.5-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 074 IELTS Listening and Speaking 0.0 Credits
High intermediate to advanced English as a second language. Prepares students to take the IELTS (International English Language Testing System) for academic and professional purposes. Provides instruction in the listening and speaking sections of the IELTS test. Placement testing is required.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 075 IELTS Reading and Writing 0.0 Credits
High intermediate to advanced English as a second language. Prepares students to take the IELTS (International English Language Testing System) for academic and professional purposes. Provides instruction in the reading and writing sections of IELTS. Placement testing is required.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL.

ESL 076 IELTS (International English Language Testing System) Test Preparation All Skills 0.0 Credits
High intermediate to advanced English as a second language. Prepares students to take the IELTS (International English Language Testing System) for academic and professional purposes. Provides instruction in the listening, speaking, reading, and writing sections of the IELTS test. Placement testing is required.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 1 times for 12 credits
Restrictions: Can enroll if major is ESL or major is IG.

ESL 080 Preparation Course for International Teaching Assistants 0.0 Credits
Intermediate to advanced English as a second language. Prepares new international teaching assistants for their responsibilities in the university. Provides intensive instruction in English language, pedagogy, and the culture of the American classroom. Department permission required. Offered as needed. 18-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 081 Accent Reduction 0.0 Credits
This is an advanced English as a second language course, which provides intensive instruction in the development of speaking and pronunciation skills. Students will practice pronunciation skills by participating actively in spoken interactions and responding appropriately while focusing on vocabulary, pronunciation, intonation patterns, and grammatical functions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ESL or major is IG.

ESL 090 English for Medical Purposes 0.0 Credits
High intermediate to advanced English as a second language. Develops participants' communication skills in medical context. Provides an overview of the American healthcare system and the dynamics of the different participants involved in the system. Placement testing is necessary. Offered as needed. 2.5-2.5-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 091 Special Topics in English Language & Culture 0.0 Credits
Advanced English as a second language. Focuses on specific issues in English structure and usage. Includes issues of discourse, sociolinguistics, and culture. Placement testing is necessary. Offered as needed. 3-0-0.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ESL 110 Introduction to Academic Discourse 3.0 Credits
The course prepares students for courses requiring English academic communication. The course provides a review of English grammar, an introduction to academic writing, reading, and academic support services. Opportunities to interact with other members of the university community are provided. By departmental approval only.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 1 times for 6 credits

ESL 180 Topics in English for Academic Purposes 2.0 Credits
This course focuses on the academic discourse of a particular genre and/or content area in English for Specific Purposes or English for Academic Purposes.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 5 times for 12 credits

Entertainment & Arts Management

Courses

EAM 130 Overview of Entertainment and Arts Management 3.0 Credits
Students acquire an understanding of the profit and non-profit organization within a social and governmental context. Of primary focus are the arts organization as an entity, how they are organized and the impact and place they have within the community.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

EAM 200 Introduction to the Music Industry 3.0 Credits
Introduction to the Music Industry gives students a basic overview of the commercial music business with an emphasis on its inherently changing nature and the entrepreneurial mindset that this demands of those involved in it. The goal of the course is to provide a basic introduction to four major areas of the industry: Contracts, Publishing, Touring & Booking, and Recording.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

EAM 211 Strategic Management for Entertainment and Arts Management 3.0 Credits
Explores the concepts of planning and evaluation as it relates to the arts. Instruction will focus on the development of business plans, including research, organization, competition, marketing, staffing, and financial issues (i.e. budgets, etc.). Students present and defend the elements of their plans. Other topics discussed will be leadership skills decision-making, and managing change.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

EAM 261 Copyrights and Trademarks 3.0 Credits
This is the introductory law course for EAM managers and discusses topics relating to copyrights, intellectual property rights, and royalties.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: BLAW 201 [Min Grade: D]

EAM 270 Audience Development for Arts 3.0 Credits
This course emphasizes the usefulness and application of marketing theories and concepts to develop audiences and promotes the arts as a valuable social sector, with a focus on marketing planning and strategy development. Focus is placed on marketing research, analysis, planning, strategy development, and development of marketing plans.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: EAM 211 [Min Grade: D]

EAM 301 Gallery and Collection Management 3.0 Credits
Discusses the professional operation of museums and commercial art galleries including advocacy, legal, administration, curatorial, exhibition, and public issues by examining the questions: What are the challenges of managing a museum's collection including acquisition policies, insurance, conservation and storage of art? What resources are needed to manage a gallery?.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

EAM 302 Exhibition Design 3.0 Credits
Discuss key issues in exhibition presentation including visual design elements, accessibility, and approachable presentation strategies. This course also explores theoretical and ethical issues related to museums, art collecting, cultural patrimony, curatorial authority, and diversity.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

EAM 310 Social Media in Entertainment 3.0 Credits
Social Media In Entertainment teaches students how to develop the strategies for using social media as a marketing tool in the arts and entertainment industries. The goal will be to develop a social media strategy for a specific entity utilizing information on strategies and tactics learned during the course, as well as how to integrate this strategy into an overall marketing plan. Students will learn how to craft a strategy, how to evaluate which social media tools and tactics to use to achieve the most effective results and how to successfully implement the strategy.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

EAM 312 Introduction to Fund Development for the Arts 3.0 Credits
This course will provide an introduction to the fundraising process and initial training needs for current and future nonprofit arts organization managers. The focus is a blend of theory and practice in the areas of fund development process, organization, and communication; the primary goal is to prepare students for successfully working with or in nonprofit arts organizations in development / fundraising capacities. Our work will cover: basic sources of funding including online fundraising; board / trustee fiduciary responsibilities; trends, ethics, and innovation in fund development.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: EAM 130 [Min Grade: D]

EAM 313 Volunteer and Board Management 3.0 Credits
This course continues the work of EAM 312- Intro to Fund Development for the Arts. It will build on that course by focusing on the area of volunteers for nonprofit organizations. Content will examine the board of directors and other volunteers in relation to governing, managing, operating a nonprofit arts entity.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: EAM 312 [Min Grade: D]

EAM 315 Content Strategies for Digital Products 3.0 Credits
In this course students will understand content strategy and its business value, as well as how to audit, plan, create, deliver and manage content that effectively promotes a brand message across multiple digital channels.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

EAM 321 Box Office and Venue Management 3.0 Credits
Focuses on the operational management tasks. Students explore the marketing and promotional component of box office management, the use of technology and ticket sales, and managing people.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: EAM 211 [Min Grade: D]

EAM 322 Performing Arts Touring 3.0 Credits
Performing Arts Touring provides an overview of organizing all types of touring entertainment with a focus on the administrative and management responsibilities including booking, staffing, and decision making. Focus is placed two basic types of touring: music concert tours and performing arts tours such as Broadway shows, ballet companies, small theatrical tours, and similar arts tours. Students learn about unions, contracts, financing, logistics, promotion, ticketing, and other areas associated with arts and entertainment touring.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

EAM 325 Producing for Live Entertainment 3.0 Credits
This course is experience-based and designed to familiarize students with all aspects of producing a live entertainment event and to discuss and develop the necessary skills to do so successfully through practical experience. The course provides an overview of the issues routinely encountered by producers of live events, both commercial and non-profit, through the actual producing of an arts/entertainment event. Skills developed include working creatively with artists; understanding project management, planning and budgeting; revenue projection and management (including possible fundraising); understanding technical and logistical issues around production; and successful execution.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 1 times for 6 credits
Restrictions: Cannot enroll if classification is Freshman

EAM 340 Artist Representation and Management 3.0 Credits
This course gives an introduction to artist representation in the entertainment and media industry. It will cover all aspects of representation including client selection, career management and strategy for artists, agent/managers' roles and managing your career. The course covers how the industry works both conceptually and politically. Discussions will include topics around the major entertainment companies, their work and focus, and how they compete. The course breaks down the industry into "revenue silos" in which a client can generate money.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

EAM 350 Arts, Culture and Society 3.0 Credits
Arts, Culture & Society examines the role of art's impact on society, exploring key cultural and public policy issues including community standards and censorship, and different approaches to public support and funding. Readings, videos, discussions and projects will explore questions as to the social functions of the arts,; the use of art for advocacy and patronage over the world; and the impact of art on society and economic development. The geographic focus of this course is global and will compare art, including commercial entertainment and the media, and cultural practices and impacts from various cultures around the world.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

EAM 361 Law for Entertainment and Arts Management Managers 3.0 Credits
Examines the relationship between the arts and law, including contracts, license fees, labor-management agreements, liability, immigration law, use fees, first amendment issues, and the formation of partnerships and corporations.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: EAM 261 [Min Grade: D]

EAM 365 Media and Entertainment Business 3.0 Credits
This course focuses on media networks and other major players in the media and entertainment business, examining their interdependence, and discussing major trends and tendencies on the market and their impact on the art and entertainment field.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

EAM 391 [WI] Entertainment Promotion and Branding 3.0 Credits
This writing intensive course will provide students with in-depth information about the essential area of publicity and promotion for the entertainment and arts industries. Through the art of public relations (PR), students will learn to maximize the potential for news coverage in print, electronic (radio, TV) and online sources. Focus will be placed on the process of writing for public relations and promotion in both style and content. By writing multiple drafts of biographies, press releases, pitch letters, students will hone skills to creatively present your message to media outlets, from local to international.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

EAM 401 [WI] Writing for Arts Managers 3.0 Credits
Focuses on non-marketing writing, with a significant portion of the class focusing on the development and writing of proposals seeking funding for arts organizations. The course covers in-depth the standard elements of a complete professionally prepared proposal, as well as exposing students to alternate formats.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: A] or HUM 108 [Min Grade: D]) and EAM 312 [Min Grade: D]

EAM 461 Entertainment Publishing 3.0 Credits
A detailed look at the publishing industry, including history and economics of publishing. Industry segments to be covered include books, periodicals and new media. Topics include developer/publisher issues, laws, industry operating characteristics, distribution and industry trends.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: EAM 361 [Min Grade: D]

EAM 471 Fine Arts Market Development 3.0 Credits
Examines the dynamics of the commercial visual arts market, including international auction houses such as Sotheby's and major private collectors. Answers questions like: How is the market value (price) of art works determined?.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

EAM 472 Trends in Visual Arts 3.0 Credits
Exploration of recent developments in the visual arts in the US and abroad. Includes the reviewing of major visual arts exhibitions and emerging artists and artistic trends within the decade. Field trips to area galleries and art museums are included.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

EAM 491 Entertainment and Arts Management Senior Project 1.0 Credit
Senior Project is a thesis course on a topic of the student's choice over the three quarters of senior year in close cooperation with a faculty advisor. The student will present their final product to a jury in their final quarter of senior year.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 3 credits
Restrictions: Can enroll if major is EAM and classification is Senior.

EAM I199 Independent Study in Enteratinment & Arts Management 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

EAM I299 Independent Study in Enteratinment & Arts Management 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

EAM I399 Independent Study in Enteratinment & Arts Management 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 4 times for 12 credits

EAM I499 Independent Study in Enteratinment & Arts Management 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

EAM T180 Special Topics in Entertainment & Arts Management 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

EAM T280 Special Topics in Entertainment & Arts Management 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

EAM T380 Special Topics in Entertainment & Arts Management 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

EAM T480 Special Topics in Entertainment & Arts Management 1.0-3.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 5 times for 15 credits

Entrepreneurship and Innovation

Courses

ENTP 100 Innovation Ecosystem 1.0 Credit
This course is designed to introduce students to the numerous and varied innovative activities that are part of Drexel University, University City and the greater Philadelphia region. The course sparks curiosity about innovations and ideas not commonly encountered and stimulates creative thinking about new opportunities.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit

ENTP 101 Life Strategies I 3.0 Credits
Life Strategies I is the first in a two-part series of courses that reinforces entrepreneurship as an increasingly important life skill. The course first explores the accelerating job market evolution and why future careers and earning a living will be vastly different from even recent history. Facts presented make the case that people should embrace entrepreneurship as a "habit of mind" as they maneuver future career options. The course then introduces the personal skill set valuable to entrepreneurs---skills every student should consider honing to help them navigate their future whether or not they plan to be an entrepreneur.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit

ENTP 102 Life Strategies II 3.0 Credits
Life Strategies II is the second in a two-part series of courses. This course introduces the fundamentals of starting an entrepreneurial endeavor by providing students with a basic understanding of startup enterprise essentials and why a startup isn't just a smaller version of a large business. The course is intended to give a student who has no business training the ability to frame a potential business idea for consideration by others using only a few simple models, common sense, and logic. Life Strategies I is a prerequisite.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit
Prerequisites: ENTP 101 [Min Grade: D]

ENTP 105 Entrepreneurship Practice & Mindset 3.0 Credits
This course is intended for anyone interested in developing an entrepreneurial practice and mindset for success in starting their own venture, or working in an established company or new start-up venture. Students will develop a mindset that will enable them to build a toolkit to create and evaluate entrepreneurial opportunities, marshal resources, and form teams driven by creativity, leadership, and smart action. In sum, this course is a journey through the fuzzy, front-end of early-stage entrepreneurial activity. This course is not intended to be a complete overview of entrepreneurship; it is an immersion experience for students to cultivate entrepreneurial thinking, not only to find and create opportunities, but in all that they do.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit

ENTP 205 Ready, Set, Fail 3.0 Credits
Central to developing an entrepreneurial mindset is learning to appreciate risk and the potential for failure. This course will introduce students to forms and causes of failure, and will explore and analyze responses to failure. Students will capitalize on their own experiences with failure to build future success.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit

ENTP 210 [WI] Leading Start-Ups 3.0 Credits
Entrepreneurs face unique leadership challenges, especially when founding a new company. This course provides the student and aspiring entrepreneur with tools and frameworks necessary for creating strategy, building companies, and assembling human capital with limited resources. By exploring what entrepreneurial leaders actually do, and how they do it, the student will learn through experiential exercises both the challenges and the excitement of starting a new venture.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit

ENTP 215 Building Entrepreneurial Teams 3.0 Credits
The overall goal of this course is to evaluate the different approaches in forming teams during the startup of a new company. We will compare and contrast evidence-based and anecdotal team formation models to determine their advantages and disadvantages as well as their effects on the expected outcomes.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENTP 225 [WI] Mindfulness & Wellbeing 3.0 Credits
Modern-day demands create stress in workers' lives, and gone unmanaged, stress can have devastating physical, psychological and financial implications. Investing in one's psychological and emotional health pays long-term dividends because it buffers the negative effects of stress, and helps individuals become their best selves. Based upon the practice of mindfulness, and the domain of positive psychology, this course teaches students how to cope with contemporary challenges, and to become more proactive and to flourish in their entrepreneurial endeavors despite them.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENTP 250 Ideation 3.0 Credits
Innovation is the driving force behind today's economy and ideation supports an individual's ability to innovate. This course provides students with tools, methods and self#reflection techniques necessary to bring new ideas into reality. Through creative innovation, successful entrepreneurs not only create new ventures but also re-invent companies to remain competitive in an ever-changing market. Students in this course will use ideation techniques to develop new ideas, change or build upon established practices and apply these techniques in approaching and analyzing business situations. Students will be able to apply creative skills more effectively both personally and professionally.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit

ENTP 270 Social Entrepreneurship 3.0 Credits
This course examines how social entrepreneurs launch successful ventures to address the world's most challenging social and environmental problems. The course introduces students to frameworks and methodologies that challenge current models to advance original solutions to existing problems. A passion for social change is advanced by adopting a market orientation and data-driven approaches that encompass both social and financial outcomes.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit

ENTP 275 Diversity Entrepreneurship 3.0 Credits
Today, underrepresented groups such as women and minority entrepreneurs are starting new business ventures at a quick pace. Yet there are few resources for the business owners to improve the historically high failure rate or grow their new venture. In this course, students will understand how race, gender, or ethnicity plays a part in establishing a women or minority-owned enterprise. The current state of diversity entrepreneurship along with the conditions that support or block disadvantaged communities in the context of entrepreneurship will be examined.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit

ENTP 285 Organizational Innovation and Change for Corporate Entrepreneurs 3.0 Credits
In today's world, change and innovation are needed at every level of an organization. New processes, organizational designs, innovative management styles, problem solving techniques, and market creation are not just for new product and service creation. An entrepreneurial mindset is the premise for the fundamental approach to meet the ongoing need for continuous change. Corporate entrepreneurs need to be well-equipped to act as change agents in an organization to diagnose, understand and address the need for change and innovation. Every organization is unique and organizational development techniques and processes should be developed specific to each organization. This course takes a deep dive into how corporate entrepreneurs can achieve planned and systematic change and improvement in a complex environment.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENTP 290 An Entrepreneur's Introduction to Land: Its Essence, Ethics, and Opportunity 3.0 Credits
This course is an interdisciplinary primer on the various layers and attributes of land, including its ecology, economics, social context, cultural history, and long-term resource capacity. An understanding of these attributes will open the door to a host of entrepreneurial and social entrepreneurial opportunity. Comprehension of key principles is achieved through hands-on exploration, journaling, field trips, experiential discussion, and real-world projects.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENTP 325 Early Stage Venture Funding 3.0 Credits
This course provides students with an understanding of the opportunities, challenges and methodologies typically associated with early-stage venture funding. It exposes students to the concepts, common practices and tools related to the funding needs of early-stage ventures with a focus on bootstrapping, friends/family financing, crowdfunding, angel-stage and venture capital investment. This course will also teach students to begin to think like an investor, evaluating startup investment decisions at each stage of a startup's development. In this way, students will be able to critically examine decision criteria around investment decisions, key questions to ask founders, and better understand what founders need to do to create the best possible conditions for favorable investments.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ACCT 115 [Min Grade: D] or ACCT 120 [Min Grade: D] or ACCT 110 [Min Grade: D]

ENTP 329 Entrepreneurship & New Technologies 3.0 Credits
Creating a new technology venture offers unique challenges. Indeed, innovation and advances in technology are prevalent, and technological innovation leads to competitive advantage. Students are introduced to the challenges of new technology- based companies that include: the complexity of intellectual property, research team development, and sources of funding. This course will examine entrepreneurship in technology markets and take a deep view of what it takes to be a technology entrepreneur.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENTP 340 Managing Entrepreneurial Growth 3.0 Credits
This course teaches students the essential concepts and skills that you need to successfully grow and manage a new business. Because managing growth includes leveraging assets and controlling risks at every stage of a new venture's development, this course focuses on areas that are essential to a new venture's growth, including planning, marketing, talent management, and financial performance. Through case studies and other experiential exercises, students will examine the growth opportunities of new ventures and then develop small business or new venture growth proposals. Students will also examine how firms obtain the necessary physical, financial and human resources necessary to grow a business during its formative years.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENTP 350 Dynamics of the Family Firm 3.0 Credits
This course studies the unique dynamics of family firms and the complex issues involved with creating, owning, and successfully operating a family business. Students will examine ownership structures, strategic human-resource issues, governance, strategy, marketing, family dynamics, culture, and philanthropy.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENTP 360 Franchising 3.0 Credits
Franchising is rapidly increasing worldwide. There is a growing need among franchise owners for employees with industry experience and know-how, and there are growing opportunities for entrepreneurs who want to start a franchise. Together, these developments present a unique opportunity for the entrepreneur. This course offers various aspects of starting, developing, and managing a franchise.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENTP 370 Global Entrepreneurship 3.0 Credits
This course focuses on international opportunity identification for new and emerging companies; market analysis; joint ventures, regional legal and cultural issues and financing foreign ventures. The course will provide students with an understanding of the complexities faced by entrepreneurs doing business in a global environment and with knowledge, which will help them to be successful within the global context. In classroom discussion, emphasis will be placed on entrepreneurship in the Eurozone, Brazil, Russia, India and China, however class projects (and discussion) will touch upon numerous countries across the globe.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENTP 375 3BL - Triple Bottom Line 3.0 Credits
The course seeks to develop students' critical capacities for reflection and action based upon a systems-thinking framework, with respect to social, environmental, and organizational challenges and the ways in which new ventures can address them. Students will learn about the history of the sustainability movement as it is the precursor of modern triple bottom line organizational forms. Lectures and readings provide the history of the sustainability movement, social movements that led to innovation, and alternative perspectives on the global economy. The course addresses the pros and cons of growing and supporting local business vs. engaging with business on a global scale.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit
Prerequisites: ENTP 270 [Min Grade: D] (Can be taken Concurrently)

ENTP 385 Innovation in Established Companies 3.0 Credits
This course provides students with an understanding of how companies remain competitive using innovation as the driving force behind product or service development. Entrepreneurs challenge assumptions and create value in established organizations. While most executives would agree that innovation is the key to a sustainable business in the 21st century, few seem to understand how to make it a reality. Students will be introduced to various kinds of internal and joint ventures, such as corporate venture-capital investments, alliances, mergers, and acquisitions to create value and promote entrepreneurship within an organization. Students will develop skills that are important for careers in an entrepreneurial setting and corporate venture activities.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENTP 390 Energy Entrepreneurship 3.0 Credits
This course will provide the groundwork to understanding new venture development in energy markets. Through experiential learning, specifically, field visits to local energy companies, and through guest speakers, students will develop an appreciation and understanding of the market conditions and policy implications of new ventures in this sector.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENTP 395 Entrepreneurship Practicum 12.0 Credits
The Entrepreneurship Practicum is a one-term experiential learning element within the three-year BA in Entrepreneurship & Innovation degree program. The Practicum provides you with a "hands-on" opportunity to use your learned entrepreneurial skills to develop your new startup idea, to work on the development of a new business idea within a startup company, or to work on new innovations in an existing business or family enterprise.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENTP 105 [Min Grade: D] and ENTP 225 [Min Grade: D]

ENTP 410 [WI] Thought Leadership 3.0 Credits
The individual entrepreneur faces many challenges. This course takes a philosophical and ethical approach to developing the entrepreneurial mindset. This course examines the ethical challenges in a start-up venture or high-growth firm, as illustrated through discussions by guest speakers– serial entrepreneurs. Students will be required to reflect on the varying viewpoints presented by the distinguished experts, and will develop their own approaches and philosophies regarding "the entrepreneur" and the "process of entrepreneurship.".
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: ENTP 210 [Min Grade: D], ENTP 270 [Min Grade: D], ENTP 385 [Min Grade: D] (Can be taken Concurrently)

ENTP 440 Launch It!: Early Stage 3.0 Credits
This course is designed for students interested in completing one of four minors offered by the Close School of Entrepreneurship: Entrepreneurship and Innovation, Social Entrepreneurship, Energy Innovations or Health Innovations. In the course, students will be expected to identify an opportunity and propose the launch of a company. Working in teams, students will also learn how to experiment with different business models, validate a market need, and build all facets of a start-up company. Students will be expected to achieve milestones and propose key risks on which the business' success depends.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENTP 450 Launch It! 3.0 Credits
This course is designed for those serious about being entrepreneurs. Students will be expected to work on the actual launching of a start-up. The course involves talking to customers, partners, competitors, experimenting with different business models, validating a market need through customer development, and building all facets of a start-up company. *Admission to this course requires submission of a business application form and approval of the application by the professor.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENTP 205 [Min Grade: D] and ENTP 325 [Min Grade: D]

ENTP I199 Independent Study in ENTP 1.0-12.0 Credit
Various topics of interest in the field of entrepreneurship will be reviewed. Topics will vary from term to term.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Can be repeated multiple times for credit

ENTP I299 Independent Study in ENTP 1.0-12.0 Credit
Various topics of interest in the field of entrepreneurship will be reviewed. Topics will vary from term to term.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Can be repeated multiple times for credit

ENTP I399 Independent Study in ENTP 1.0-12.0 Credit
Various topics of interest in the field of entrepreneurship will be reviewed. Topics will vary from term to term.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Can be repeated multiple times for credit

ENTP I499 Independent Study in ENTP 1.0-12.0 Credit
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Can be repeated multiple times for credit

ENTP T180 Special Topics in Entrepreneurship 1.0-12.0 Credit
This course covers various topics of particular relevance to the study of entrepreneurship.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Can be repeated multiple times for credit

ENTP T280 Special Topics in Entrepreneurship 0.0-12.0 Credits
This course covers various topics of particular relevance to the study of entrepreneurship.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Can be repeated multiple times for credit

ENTP T380 Special Topics in Entrepreneurship 1.0-12.0 Credit
This course covers various topics of particular relevance to the study of entrepreneurship.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

ENTP T480 Special Topics in Entrepreneurship 1.0-12.0 Credit
This course covers various topics of particular relevance to the study of entrepreneurship.
College/Department: Close School of Entrepreneurship-3145
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

Environmental Engineering

Courses

ENVE 300 Introduction to Environmental Engineering 3.0 Credits
Overview of environmental engineering practice: water resources, water and waste control, solid waste, air pollution, risk management and environmental health. Population and resource demand forecasting, chemistry and microbiology necessary to solve basic problems is included.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CAEE 202 [Min Grade: D] and CAEE 203 [Min Grade: D]

ENVE 302 Environmental Transport and Kinetics 3.0 Credits
Covers applications of mass balances to describing transport environmental systems, diffusive and dispersive processes, and coupling of transport and kinetic models.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHE 201 [Min Grade: D] or CHE 211 [Min Grade: D]

ENVE 316 Fundamentals of Environmental Biotechnology 3.0 Credits
This is an introductory course in environmental biotechnology for upper-level undergraduates and graduate students in engineering. The fundamentals of microbiology and molecular biology important to environmental engineering applications will be emphasized.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: BIO 141 [Min Grade: D] and (ENVE 300 [Min Grade: D] or CHE 211 [Min Grade: D])

ENVE 335 Industrial Safety 3.0 Credits
Examines safety in the workplace, loss prevention principles, Occupational Safety and Health Act implementation, accident investigation techniques, and basics of loss control and risk management.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENVE 410 Solid and Hazardous Waste 3.0 Credits
Provides an overview of municipal and industrial waste management, including design and economic analysis. Discusses options such as landfilling and incineration from engineering, social, and regulatory perspectives. Reviews physical, chemical, and biological treatment of hazardous waste.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENVE 415 Recycling of Materials 3.0 Credits
This course will examine the selection criteria for recycling component materials. Recycling involves both reusing materials for energy applications and reprocessing materials into new products.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ENVE 302 [Min Grade: D]

ENVE 416 Urban Water Resources & Infrastructure Systems 3.0 Credits
This course covers planning, design, and operation of water and wastewater systems in urban areas. Topics include domestic and firefighting water supply, treatment, storage and distribution; wastewater collection and treatment; stormwater collection, peak flow attenuation and treatment, and protection of source/receiving water aquatic habitat.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ENVE 300 [Min Grade: D] and CIVE 330 [Min Grade: D] and CIVE 430 [Min Grade: D]

ENVE 421 Water and Waste Treatment II 3.0 Credits
Covers processes used for water purification and waste treatment, containment and immobilization of hazardous wastes, and ultimate disposal of residues and hazardous materials.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.

ENVE 422 Water and Waste Treatment Design 3.0 Credits
Covers integration of processes into a complete treatment system. Includes detailed design procedures to control wastes, prevent environmental contamination, and protect drinking water quality.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENVE 421 [Min Grade: D]

ENVE 435 Groundwater Remediation 3.0 Credits
Reviews physical, chemical, and biological remediation technologies for contaminated sites and groundwater by in-site and ex-site applications.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENVE 450 Data-based Engineering Modeling 3.0 Credits
This course covers empirical methods to understand and model engineering systems. Students will learn to develop evaluate statistical models and use three common statistical software packages, Excel, SPSS, and R.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Junior or Pre-Junior or Sophomore
Prerequisites: ENGR 361 [Min Grade: D] or CHE 335 [Min Grade: D] or MEM 361 [Min Grade: D] or MATH 311 [Min Grade: D]

ENVE 455 Geographic Information Systems 3.0 Credits
The course provides grounding in fundamental principles of GIS, and achieves understanding through hands on practical laboratories. Course topics include: spatial reference systems, geographic data theory and structures, structures, spatial analysis tools, functions and algorithms, GIS data sources, compilation and quality, and GIS project design and planning.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.

ENVE 460 Fundamentals of Air Pollution Control 3.0 Credits
Fundamental topics with regard to the formation and control of air pollutants are studied. This course provides strong foundation for engineers who will be involved in the development of engineering solutions for industrial air pollution prevention and design, development or selection of air pollution control devices and systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

ENVE 465 Indoor Air Quality 3.0 Credits
Introduces basic concepts about indoor air quality, indoor air pollutants, including their sources and health effects, transport of pollutants, modeling of pollutant concentration in buildings, and ventilation as well as air cleaning systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ENVE 302 [Min Grade: D] or AE 220 [Min Grade: D]

ENVE 470 Industrial Ecology 3.0 Credits
Industrial Ecology (IE) is an evolving view of industrial operations which seeks to design processes and manufacture products in such a way to minimize and optimize their environmental interactions. IE borrows the analogy from nature that "waste" from one organism is "food" for another. Within the "technosphere", the organization in which economic processes and activities are conducted by humans, IE uses the evolving tools life cycle assessment (LCA), material flow analysis (MFA), and economic valuation, to explore novel approaches to minimizing waste stocks and flows at both micro and macro levels.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CIVE 240 [Min Grade: B-] and ENVE 300 [Min Grade: B-]

ENVE 471 Environmental Life Cycle Assessment 3.0 Credits
This course provides undergraduate engineering students with an enhanced skill set to permit them to cooperate more fully in the sustainable design and planning of engineering systems. Students will be introduced to the systems analysis modeling approaches, life cycle assessment (LCA) and material flow analysis (MFA), and will explore research-oriented aspects of the methods and their application in engineering design, decisions, and public policy.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ENVE 300 [Min Grade: B-] and CIVE 240 [Min Grade: B-]

ENVE 485 Professional Environmental Engineering Practice 1.0 Credit
Professional and ethical considerations in environmental engineering practice. Career management and lifelong learning.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ENVE and classification is Senior.

ENVE 486 Environmental Engineering Processes Laboratory I 2.0 Credits
Laboratory experiments on common environmental engineering unit processes are performed. Students use data to draw conclusions relevant to design of full-scale systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ENVE and classification is Senior.
Prerequisites: ENVE 302 [Min Grade: D] and ENVS 401 [Min Grade: D]

ENVE 487 Environmental Engineering Processes Laboratory II 2.0 Credits
Laboratory experiments on common environmental engineering unit processes are performed. Students use data to draw conclusions relevant to design of full-scale systems. Continuation of ENVE 486.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ENVE and classification is Senior.
Prerequisites: ENVE 486 [Min Grade: D]

ENVE 491 [WI] Senior Project Design I 3.0 Credits
Introduces the design process. Covers information retrieval, problem definition, proposal writing, patents, and design notebooks. Explores problem areas through presentations by experts from industry, government, and education. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: ENVE 302 [Min Grade: D]

ENVE 492 [WI] Senior Design Project II 3.0 Credits
Continues the work started in ENVE 491. Requires written and oral progress reports. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: ENVE 491 [Min Grade: D]

ENVE 493 [WI] Senior Design Project III 3.0 Credits
This course is the final sequence in the design project. It requires written and oral final reports, including oral presentations by each design team at a formal Design Conference open to the public and conducted in the style of a professional conference. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: ENVE 492 [Min Grade: D]

ENVE I199 Independent Study in ENVE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ENVE I299 Independent Study in ENVE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ENVE I399 Independent Study in ENVE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ENVE I499 Independent Study in ENVE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ENVE T180 Special Topics in ENVE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ENVE T280 Special Topics in ENVE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ENVE T380 Special Topics in ENVE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

ENVE T480 Special Topics in ENVE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

Environmental Graphic Design

Courses

EVGD 200 Introduction to Environmental Graphic Design 4.0 Credits
This course is an introduction to the Environmental Graphic Design specialty including wayfinding systems, architectural graphics, signage, exhibit design, and mapped and themed environments.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is GRDS.
Prerequisites: VSCM 230 [Min Grade: D] and VSCM 240 [Min Grade: D]

EVGD 210 Architectural Signage 4.0 Credits
Architectural Signage focuses on identification and wayfinding systems within a built environment. This course explores means and methods through class exercises and assigned projects.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is GRDS.
Prerequisites: EVGD 200 [Min Grade: D]

EVGD 220 Wayfinding 4.0 Credits
This course explores the discipline of wayfinding in an urban environment through the use of visual clues and directional hierarchy, including typography, symbols, and color.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is GRDS.
Prerequisites: EVGD 210 [Min Grade: D]

EVGD 310 Design Techniques and Materials 3.0 Credits
This course introduces a wide range of materials and techniques and explores how they may be applied to develop a successful environmental graphics project.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is GRDS.
Prerequisites: EVGD 220 [Min Grade: D]

EVGD 320 Exhibit Design 4.0 Credits
This exploration of exhibit design focuses on communicating a narrative visually through the design of space, graphics, objects, and interactivity.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is GRDS.
Prerequisites: VSCM 230 [Min Grade: D] and VSCM 240 [Min Grade: D] and EVGD 200 [Min Grade: D]

EVGD 421 Environmental Branding 4.0 Credits
This course explores the marketing power of a branded identity when it is visually and spatially applied to a retail environment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is GRDS.
Prerequisites: EVGD 320 [Min Grade: D]

EVGD I199 Independent Study in EVGD 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

EVGD I299 Independent Study in EVGD 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

EVGD I399 Independent Study in EVGD 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

EVGD I499 Independent Study in EVGD 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

EVGD T180 Special Topics in Environmental Graphic Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

EVGD T280 Special Topics in Environmental Graphic Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

EVGD T380 Special Topics in Environmental Graphic Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

EVGD T480 Special Topics in Environmental Graphic Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Environmental Science

Courses

ENVS 101 Introduction to Environmental Science 5.0 Credits
Students will be introduced to a variety of disciplines and techniques necessary to effectively study local stream, marsh, lake, and terrestrial ecosystems. Students will examine the physical, chemical, and biological elements with these ecosystems with an emphasis on biological elements. Some of the field experiences will include learning how to sample algae, higher plants, invertebrates, fish and salamanders, and methods for surveying and monitoring marshes and selected physical and chemical measurements.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ENSS or major is ENVS or major is GEO.

ENVS 102 Natural History, Research and Collections 2.0 Credits
Students will learn about the scope, nature and uses of the specimen collection, methods of collection care, maintenance and growth for different taxonomic groups. Students will learn how biodiversity research questions and projects are conceived and implemented. Students will observe and collect specimens and data, and begin to learn analyses and publication of results. Students will gain an appreciation for the role of natural history collections in modern research.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ENVS or major is GEO.

ENVS 108 Excel for Ecological Data Analysis 1.0 Credit
This is a basic course in the use of Excel for data management and analysis. Assuming little prior knowledge of Excel, the course focuses on analyses typically performed by environmental scientists and biologists. Lectures, exercises, and all graded materials will focus on using Excel on laptops.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENVS 160 Environment in the News 2.0 Credits
This course is an examination of how environmental topics are covered by popular news media. Students will learn the science that is being discussed by current news outlets. Topics will vary by term but may include: natural disasters, environmental policy and regulation, global warming and climate change, habitat loss, species extinction. Students will review and discuss current news articles and relevant scientific publications.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENVS 169 Environmental Science 3.0 Credits
This course provides an introduction to environmental problems and their causes, cultural changes, worldviews, ethics and environment. It covers such topics as science, matter and energy, ecosystems and how they work, air and air pollution, climate, global warming, and ozone loss, waste minerals and soil, solid, toxic and hazardous wastes, protecting food sources and energy resources.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is BIO or major is ENVS

ENVS 201 Practical Identification of Plants and Animals 2.0 Credits
This course provides instruction and hands on experience in using print and online taxonomic keys, field guides and reference collections of real specimens for identification of plants, animals and fungi. The emphasis is on the flora and fauna of the Philadelphia region and learning how to use identification tools in the field and lab. The main objective is to have students understand the importance of accurate identification of organisms and to develop basic knowledge and skills that can be extended and applied to organisms widely.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ENVS.
Prerequisites: BIO 124 [Min Grade: D]

ENVS 202 Tree of Life 2.0 Credits
This course reviews the diversity of life in the context of phylogenetic history as the organizing principle. The course emphasizes recent discoveries of living and fossil taxa, breakthroughs and controversies in resolving relationships, and the key evolutionary innovations in eukaryotes, such as multicellularity, major shifts in habitat, parasitism, symbiosis, and complex morphological novelties.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ENVS or major is GEO.
Prerequisites: BIO 124 [Min Grade: D]

ENVS 203 The Watershed Approach 2.0 Credits
Students will integrate several disciplines of study to compare an urbanized to a non-urbanized stream ecosystem. All elements of the stream ecosystem and its watershed will be examined. Field experience will include learning how to assess the physical properties of a stream, measure and monitor water quality, sample invertebrates and vertebrates.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ENVS.
Prerequisites: ENVS 101 [Min Grade: D] or BIO 126 [Min Grade: D]

ENVS 212 Evolution 4.0 Credits
Aspects of the fact of evolution are discussed in class, including early evolutionary thought, pivotal moments in the history of life, and evidences for evolution from fossils, genetics, and living organisms. Key concepts include natural selection, speciation, adaptation, vicariance, inclusive fitness, and evodevo. Non-scientific arguments pertaining to evolution are refuted.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 100 [Min Grade: D] or BIO 101 [Min Grade: D] or BIO 107 [Min Grade: D] or BIO 109 [Min Grade: D] or BIO 124 [Min Grade: D] or BIO 141 [Min Grade: D]

ENVS 223 Foraging for Edible Plants 3.0 Credits
This course explores the historical and contemporary reasons why humans forage for edible plants. There will be discussion about modern diets in a global agricultural world, and common pervasive myths about the dangers of foraging for wild plants. During this course, students will learn about how to identify species of edible plants, and recognize poisonous plants of the region.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENVS 226 Discoveries in Animal Behavior 3.0 Credits
The course explores the incredible diversity of animal behavior using specially selected examples of recent research findings. It focuses on the adaptiveness of behavior: how animals solve problems posed by their physical and social environments. We will consider implications of research on other species for understanding our own (human) behavior. Non-majors only.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENVS 230 General Ecology 3.0 Credits
This course examines how organisms interact with the biological and physical world and bridges the natural sciences with the social sciences. Using evolutionary theory as its basis, this course will cover topics spanning multiple levels of organization within the science of ecology.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 126 [Min Grade: D] or BIO 141 [Min Grade: D] or BIO 101 [Min Grade: D] or BIO 109 [Min Grade: D]

ENVS 247 Native Plants and Sustainability 3.0 Credits
Plants are an integral part of our daily lives in nearly every way, directly or indirectly. Increasingly, our landscapes are becoming dominated with species that are introduced from other parts of the world (intentionally or by accident), displacing many of the species that were once key components of our ecosystems. The impacts of the loss of native plants are profound. This course will give students an overview of the many reasons why native plants are critically important to us, and the problems that arise when non-native plants replace them. There will be discussions about topics ranging from evolutionary theory, conservation, agriculture, public health, nutrition, and more.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENVS 254 Invertebrate Morphology and Physiology 3.0 Credits
Provides comparative study of the major invertebrate groups, relationships between physiology and organismal structure, phylogenetic relationships and classification, development, and life histories.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 100 [Min Grade: D] or BIO 101 [Min Grade: D] or BIO 107 [Min Grade: D] or BIO 109 [Min Grade: D] or BIO 124 [Min Grade: D]
Corequisite: ENVS 255

ENVS 255 Invertebrate Morphology and Physiology Lab 2.0 Credits
This laboratory course provides a comparative study of the morphology of representative species from the major invertebrate groups. How their structural features relate to their physiology and behavior is emphasized. Identification of species, examining phylogenetic relationships, and understanding life histories will relate organisms to their ecological roles.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Corequisite: ENVS 254

ENVS 260 Environmental Science and Society 3.0 Credits
This course is a multidisciplinary introduction to the range of disciplines that make up the environmental sciences. The aim of this course is to provide an understanding of basic physical, ecological and social sciences that focus on the study on the natural environment and its interaction with human society.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENVS 275 Global Climate Change 3.0 Credits
This course provides a multidisciplinary introduction to the issue of global climate change. It focuses on the scientific evidence for climate change, its impact on natural and human systems, actions that can be taken to mitigate or adapt to climate change and the political and cultural dynamics of this issue.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENVS 284 Physiological and Population Ecology 3.0 Credits
Examines the role of physiological adaptation in the ecology of plants and animals and the principles of population biology as applied to biological systems.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENVS 230 [Min Grade: D]

ENVS 285 [WI] Population Ecology Laboratory 2.0 Credits
This laboratory course will introduce the basic concepts of populations ecology in context of their modern ramifications and will prepare students for advanced research in population ecology. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENVS 284 [Min Grade: D] (Can be taken Concurrently)

ENVS 286 Community and Ecosystem Ecology 3.0 Credits
Introduces the principles of community and ecosystem ecology. Emphasizes the role of community structure and ecosystem organization in the ecology of plants and animals.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENVS 230 [Min Grade: D]

ENVS 287 Community Ecology Laboratory 2.0 Credits
This laboratory course will introduce the basic concepts of community ecology in context of their modern ramifications and will prepare students for advanced research in community and ecosystem ecology. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENVS 286 [Min Grade: D] (Can be taken Concurrently)

ENVS 289 Global Warming, Biodiversity and Your Future 3.0 Credits
Human induced global warming is changing the physical environment, ecological systems, and human systems around the world. We will explore causes, effects, and consequences of global warming using NASA satellite information and current scientific and semi-popular writings. Students will understand the implications of global climate change for their futures.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENVS 302 Environmental Chemistry Laboratory 2.0 Credits
In this curse students will learn basic techniques for chemical analysis of environmental samples, including biological material, water and soil. Students will also learn to utilize more manual methods but will also use electronic data acquisition systems and further develop their scientific writing skills.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ENVS.
Prerequisites: CHEM 103 [Min Grade: D]

ENVS 304 Energy and the Environment: Iceland 3.0 Credits
This course studies how an economy and culture changes when it switches from fossil to alternative energy. In the last 30 years Iceland has switched from a poor country fueled by fossil fuels to one of the wealthiest nations in Europe, with only 20 percent of its energy coming from fossil fuels. In this class students will synthesize data/knowledge into flow diagrams of the economy of Iceland and then use the synthesis to understand the impacts of energy development and extraction on the environment and society.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENVS 305 Iceland Intensive: Green Energy 1.0 Credit
Students will attend an intensive course in Iceland on energy plants and their impact on the environment. The course in Iceland will bring students to various energy facilities to examine their operation and better understand how these facilities impact the environment and serve society. Before each tour of a power plant students will attend a lecture at Reykjavik University on power production and its role in fueling economies and its potential impacts on the environment.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENVS 308 GIS and Environmental Modeling 3.0 Credits
Students will learn how to write computer programs to read data directly from digital maps and then perform various spatial analyses and modeling tasks. The class will include an introduction to spatial- and geo-statistics; techniques for determining ecological riches of organisms; methods for modeling basic forcing factors such as solar radiation, water temperature; approaches for modeling the flow of water in a landscape; and ultimately, combining these techniques to model or simulate ecosystems.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENVS 310 Introduction to Environmental Chemistry 3.0 Credits
This course uses a topic-based approach to the chemistry of the environment. Students in this course are expected to have a minimal/some knowledge of chemistry, with a desire of applying this knowledge to the environment. Topics of interest include environmental chemistry of water, water pollution, water treatment, geochemistry, atmospheric chemistry, air pollution, hazardous materials and resources.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 103 [Min Grade: D]

ENVS 312 Systematic Biology 3.0 Credits
This is an introduction to systematic biology. The primary tasks of systematics are 1) the discovery, description, and classification of biodiversity to construct a general reference system for life on Earth; 2) the reconstruction of the "tree of life": the descent relationships among units of biodiversity at multiple hierarchic levels from genes to phyla; and 3) the application of reconstructions of decent relationships to the study of evolution. Phylogenetic systematics, concerned with units of biodiversity at the species level and above, will be emphasized.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENVS 202 [Min Grade: D] or BIO 126 [Min Grade: D] or BIO 141 [Min Grade: D]

ENVS 315 Plant Animal Interactions 3.0 Credits
Plant-animal interactions provide us with some of the most remarkable examples of adaptation and co-evolution. They are also key determinants of ecosystem functions. This course will provide a survey of the diversity of plant-animal interactions, the multidisciplinary approaches used to understand their ecology and evolution, and their importance to ecosystem services that sustain human societies.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENVS 230 [Min Grade: D] or BIO 126 [Min Grade: D]

ENVS 322 Tropical Ecology 3.0 Credits
This is a course in the ecology of tropical rain forests and dry forests. Tropical ecology will explore the physical and biological factors that result in the formation of the forest, the effect of human impact, the effectiveness of management, and the future of these forests.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENVS 230 [Min Grade: D] or BIO 126 [Min Grade: D] or BIO 141 [Min Grade: D]

ENVS 323 Tropical Field Studies 3.0 Credits
This is a study abroad course focusing on the ecology of tropical forest ecosystems. We will visit and compare forest ecosystems in several ecological life zones. The course will combine lectures, natural history surveys, faculty-led field research problems, and learning experiences with local residents to explore the biological diversity and function of tropical forests, including the effects of human impacts. Some background in Biology or Ecology is useful.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENVS 326 Molecular Ecology 3.0 Credits
Through a combination of lecture, discussion, and computational exercises, students will learn how molecular tools have been used to study genetic variation. They will then learn how these studies have provided answers to previously unanswered questions in fields including ecology, evolution, behavior, conservation, and forensics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENVS 230 [Min Grade: D] or ENVS 284 [Min Grade: D] or BIO 211 [Min Grade: D] or BIO 218 [Min Grade: D] or BIO 141 [Min Grade: D]

ENVS 327 Molecular Ecology Laboratory 2.0 Credits
Through a combination of laboratory and computational exercises, students will develop a toolkit for applied molecular studies of ecology and evolution. The course will focus on initiating or continuing a novel research project relating to one of several topics within the field of molecular ecology.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENVS 230 [Min Grade: D] or ENVS 284 [Min Grade: D] or BIO 211 [Min Grade: D] or BIO 218 [Min Grade: D]

ENVS 328 Conservation Biology 3.0 Credits
This course we will detail the loss of biodiversity and explore related issues, including the theories and practices of conservation biology and the solutions currently and the solutions currently being formulated to enhance the preservation of species on our planet. The course will explore potential limitations to these strategies and provide an appreciation of the relevance of ethics, economics and politics to biodiversity conservation while promoting the potential for individual action to influence conservation efforts.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENVS 230 [Min Grade: D] or BIO 126 [Min Grade: D]

ENVS 330 Aquatic Ecology 3.0 Credits
Studies the relationships between aquatic plants and animals and their environment. Introduces the study of the ecology of lakes, rivers, ponds, and streams.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.
Prerequisites: ENVS 230 [Min Grade: D] or BIO 126 [Min Grade: D] or BIO 141 [Min Grade: D]

ENVS 333 Wetland Ecology 3.0 Credits
Examination of the structure, function, and dynamics of wetland ecosystems. Topics include geomorphology, hydrology, biogeochemistry, plant and animal adaptations to wetland environments, and wetland policy.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENVS 230 [Min Grade: D] or BIO 126 [Min Grade: D]

ENVS 334 Watershed Ecology 3.0 Credits
Watershed ecology explores the linkages among aquatic ecosystems and their water catchment or watershed. Aquatic ecosystems are influenced by physical, chemical, and biologic factors in "the watershed." The conditions in the watershed influence aquatic ecosystems at several spatial-scales, for example areas neighboring a stream, "the riparian zone," influences water temperature much more than those areas further away from the stream. Incorporating spatial scale into watershed studies is a developing field with many opportunities to advance watershed science and the associated environmental regulations and policies.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENVS 230 [Min Grade: D] or BIO 126 [Min Grade: D]

ENVS 335 Aquatic Insects and Water Quality 3.0 Credits
Healthy water quality has always been an essential part of human survival and culture. This course outlines the importance of using aquatic macroinvertebrates (principally insects) for assessing water quality and its wide use by government, consulting businesses and citizen groups. Nearly 90 groups of aquatic macroinvertebrates used in stream assessment and in sampling will be identified.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 126 [Min Grade: D] or ENVS 230 [Min Grade: D]

ENVS 336 Terrestrial Ecology 5.0 Credits
Studies the relationships between terrestrial plants and animals and their environment. Introduces the study of the ecology of local ecosystems, such as the Poconos and the New Jersey Pine Barrens.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: BIO 126 [Min Grade: D] or ENVR 230 [Min Grade: D] or ENVS 230 [Min Grade: D]

ENVS 341 Equatorial Guinea: Society & Environment 4.5 Credits
A lecture and community outreach course based at the National University of Equatorial Guinea that combines instruction in mankind's relationship with the natural environment (human population, natural resources, environmental degradation, pollution, biodiversity loss and climate change) with environmental outreach activities specific to Equatorial Guinea.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENVS 342 Equatorial Guinea: Natural Resource Economics 4.5 Credits
A lecture course based a the National University of Equatorial Guinea that combines instruction in the economic implications of natural resources (renewable and non-renewable resources, efficient utilization, market performance, government controls, sustainability and discounting) with a university-wide guest lecture series addressing local issues.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENVS 343 Equatorial Guinea: Field Methods 3.0 Credits
A lecture and field excursion course based at the University of Equatorial Guinea combining instruction in standard methods for studying rainforest communities (expedition planning; GPS and mapping, forest diversity and productivity; wildlife population monitoring) with multi-day field experiences in Bioko Island's remote protected areas.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENVS 344 Equatorial Guinea: Field Research 6.0 Credits
An intensive research course that takes advantage of the unspoiled rainforest adjacent to the Moka Wildlife Center, a university-affiliated research station located in the highlands of Bioko Island, Equatorial Guinea (Central/West Africa). Opportunities exist for student research on topics including primates, antelope, birds, chameleons, butterflies and plants.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 1 times for 6 credits

ENVS 345 Equatorial Guinea: Conservation Biology 4.5 Credits
The goal of this course is to introduce the field of conservation biology, with a special emphasis on biodiversity conservation on Bioko Island, Equatorial Guinea. The course is an experiential learning course that focuses on the ways that the Bioko Biodiversity Protection Program (BBPP) uses keystone concepts in conservation science to implement research, education, outreach and sustainable livelihood programs to support the conservation of wildlife and wilderness in Equatorial Guinea.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENVS 351 Resource and Environmental Economics 4.0 Credits
Examines the microeconomic and quantitative aspects of markets for both renewable and exhaustible resources, and the interaction between the energy and resource sectors of the economy and between the productive sectors of the economy and the natural environment, with evaluation of major public initiatives and issues in these areas.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECON 201 [Min Grade: D] and ECON 202 [Min Grade: D]

ENVS 352 Ornithology 3.0 Credits
Birds are among the most ubiquitous, diverse, and charismatic animals and we know a great deal about their biology. This course aims to teach students who are enthusiastic about natural history about the biology of birds and covers a variety of topics including evolution, ecology, behavior, conservation, and diversity of birds and uses the world renowned specimen collections housed in the Academy of Natural Sciences of Drexel University.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 126 [Min Grade: D] or ENVS 230 [Min Grade: D] or BIO 109 [Min Grade: D] or BIO 141 [Min Grade: D]

ENVS 353 Field Ornithology Lab 2.0 Credits
The Delaware Valley is the cradle of North American Ornithology. This course aims to give students a hands on lab and field experience in identifying birds found in the Delaware Valley. Half of the classes are held outside at local parks and refuges and the remainder are in the lab where specimens from the world renowned collections housed at the Academy of Natural Sciences of Drexel University will be studied.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENVS 354 Ichthyology 3.0 Credits
This course will explore fish and the link between their diversity in form and ecological function. This combined lecture-lab course will cover the basic systematics, evolutionary relationships, biogeography, structure, physiology, life history, and ecology of fishes and lampreys.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 126 [Min Grade: D] or ENVS 230 [Min Grade: D]

ENVS 355 Biogeography 3.0 Credits
This course is a survey of the field of Biogeography, the study of biological diversity across space and time. Factors and evolutionary history that influence both the ecology and evolution of organismal diversity will be covered. Topics will range from how species distributions arise to how we define species and how we reconstruct the influence and importance of both ecology and evolutionary history on their distributions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 126 [Min Grade: D] or ENVS 212 [Min Grade: D]

ENVS 360 Evolutionary Developmental Biology 3.0 Credits
Evolutionary Developmental Biology (Evo-Devo) compares developmental processes between organisms to determine how these mechanisms evolved in light of ancestral relationships. Topics include "your inner fish," how to "build" a dinosaur, and the reducibly simple evolution of the eye. Also explored are developmental controls such as environmental factors and molecular mechanisms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENVS 212 [Min Grade: D] or BIO 217 [Min Grade: D]

ENVS 364 Animal Behavior 3.0 Credits
The mechanisms, ecology and evolution of the activities of animals in relation to their natural environment. Topics include development and control (neural and hormonal) of behavior, adaptations for survival, feeding, and predator avoidance, strategies of habitat selection, communication, reproduction, and social behavior.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENVS 212 [Min Grade: D] or BIO 126 [Min Grade: D]

ENVS 365 Animal Behavior Laboratory 2.0 Credits
An observational study of the behavior of a captive group of social animals at the Philadelphia Zoo including species selection, background research, ethogram construction, 16 hours of quantified observation, analysis of data and written report.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENVS 230 [Min Grade: D] or BIO 126 [Min Grade: D]

ENVS 370 Practice of Environmental Economics 3.0 Credits
The focus of this course is on the real world implications of environmental resources exploitation and economic tools for dealing with them. Areas include air and water pollution, toxic wastes and mineral, water and forestry resource harvesting/extraction.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECON 201 [Min Grade: D] and ECON 202 [Min Grade: D]

ENVS 382 Field Botany of the New Jersey Pine Barrens 4.0 Credits
This course focuses on plant identification skills that are necessary to conduct scientific botanical surveys. The vascular flora of the New Jersey Pine Barrens, including rare plant species, is emphasized with special reference to habitat and community analysis. Non-vascular species are examined but not emphasized.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.

ENVS 383 Ecology of the New Jersey Pine Barrens 4.0 Credits
Course focuses on the ecology of the New Jersey Pine Barrens. Students learn field methods, identify index species (flora and fauna), perform community analyses, and use equipment for measuring abiotic variables (soil and water). Field exercises focus on key aspects of the regional ecology: fire, soil and water.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.
Prerequisites: ENVS 230 [Min Grade: D] or BIO 126 [Min Grade: D]

ENVS 385 Systems Ecology 3.0 Credits
Systems Ecology will provide the tools to integrate and synthesize disciplines of sciences to understand the development, disruption, and dynamics of ecosystems. Students will learn general systems theory about how elements of an ecosystem interact with other parts of the system and how exogenous or external variables drive ecosystem processes. The course will show how to combine field data with simple mathematics in step by step calculations to describe, study, and emulate complex systems.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 126 [Min Grade: D] or BIO 141 [Min Grade: D]

ENVS 388 Marine Field Methods 4.0 Credits
Course focus is on the ecology of local marine environments. Students learn marine field survey methods, identification of marine organisms, habitat analyses, and use of equipment for measuring abiotic variables. Students sample fish, plankton and invertebrate species aboard the Drexel 25 foot Research Vessel Peter Kilham.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.
Prerequisites: ENVS 230 [Min Grade: D] or BIO 126 [Min Grade: D]

ENVS 390 Marine Ecology 3.0 Credits
This course studies major processes in the marine environment, especially relationships between organisms and the factors that influence their abundance.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.
Prerequisites: ENVS 230 [Min Grade: D] or BIO 126 [Min Grade: D] or BIO 141 [Min Grade: D]

ENVS 391 Freshwater and Marine Algae 3.0 Credits
Origin and evolution of various algal groups, principles and methods of algal systematics, algal ecology, and use of algae as environmental indicators. Field trips to local streams, ponds and wetlands where students will collect algal samples and record environmental data. Lab work will include sample processing and algal identification.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.
Prerequisites: BIO 124 [Min Grade: D] or BIO 141 [Min Grade: D]

ENVS 392 Ichthyology and Herpetology 3.0 Credits
Many species of fishes, amphibians and reptiles face extirpation from their former ranges and some face total extinction within our lifetime. This course investigates major regional and global issues concerning viability of these organisms and addresses solutions using concepts of population ecology, community ecology, physiological ecology and conservation biology.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

ENVS 393 Entomology 3.0 Credits
This course introduces students to some of the major topics in the field of entomology.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 124 [Min Grade: D] or BIO 141 [Min Grade: D]

ENVS 394 Entomology Laboratory 2.0 Credits
This course introduces students to some of the major practical topics in the field of entomology. The course consists of lab work, collecting trips, and creation of an insect collection.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 124 [Min Grade: D] or BIO 141 [Min Grade: D]

ENVS 400 Cascade Mentoring 2.0 Credits
Provides senior ENVS students with mentoring and service opportunities within the Environmental Science curriculum. The course will also cover issues of ethics, professional development and career counseling. ENVS senior students will be required to enroll as a peer mentor for one of these six courses. Seniors will work with faculty to help plan and deliver experiential activities and will act as mentors and tutors for first and second year students enrolled in these courses.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 6 credits
Restrictions: Can enroll if major is ENVS and classification is Senior.

ENVS 401 Chemistry of the Environment 3.0 Credits
Covers principles of physical and organic chemistry applicable to the study and evaluation of environmental conditions, especially the pollution of air, water, and soil (including chemical changes and reactions in the environment).
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHEM 102 [Min Grade: D] or CHEM 122 [Min Grade: D]

ENVS 405 Atmospheric Chemistry 3.0 Credits
Introduces the principles of atmospheric physics and photochemical kinetics as a prelude to understanding the atmospheric chemical system. Examines the chemistry of the natural atmosphere to prepare for the understanding of how pollutants interact with natural species. Considers pollution of the stratosphere and the troposphere.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHEM 102 [Min Grade: D] or CHEM 122 [Min Grade: D]

ENVS 409 Environmental Surveying and GIS 3.0 Credits
This course is a field intensive course that gives students hands on training on state-of-the-art surveying gear. Students will learn the principals of surveying used by field ecologists or geoscientists, including types of surveying gear, how to use it in the field, and how to analyze collected data.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENVS 410 Physiological Ecology 3.0 Credits
Examines mechanisms by which physiological factors affect and limit the distribution and abundance of animals, including physiological and behavioral thermoregulation, heat and cold tolerance, acclimation, metabolism, osmoregulation and dehydration tolerance, feeding strategies, digestion and feeding patterns, energy and water budges, toxins and optimality theory.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENVS 230 [Min Grade: D] or BIO 126 [Min Grade: D] or BIO 141 [Min Grade: D]

ENVS 412 Biophysical Ecology 3.0 Credits
Covers energy balances and methods of heat transfer in organisms, including convection, conduction, radiation, evaporation, and metabolism and steady-state and transient energy balances, including mass balances, water uptake and evaporation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (MATH 239 [Min Grade: D] or MATH 123 [Min Grade: D]) and (PHYS 153 [Min Grade: D] or PHYS 102 [Min Grade: D])

ENVS 413 Advanced Population Ecology 3.0 Credits
One on of the greatest issues concerning life on Earth and human impact on the planet is whether species will survive or go extinct. This course explores how wild populations change over time and investigates the concepts and quantitative methods used to determine the viability of plant and animal populations.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENVS 284 [Min Grade: D]

ENVS 414 Advanced Community Ecology 3.0 Credits
Community ecology is the study of how populations of organisms interact with each other and the physical environment. Students will investigate the underlying principles that explain and predict interactions among populations of organisms, and how these principles can be used to conserve and manage wild animal and plant communities.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENVS 286 [Min Grade: D]

ENVS 415 Advanced Environmental GIS 3.0 Credits
This course is structured to build upon techniques and skills learned in an introductory level GIS class. This advanced course is technically oriented and will introduce high-level geospatial analyses in an environmental science context. Provides instruction and theory of geospatial modeling, mapping, and future trends.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENVS 308 [Min Grade: D] or ENVE 455 [Min Grade: D]

ENVS 417 Stream Assessment 3.0 Credits
Most stream and river ecosystems are stressed by human activities, and aquatic ecologists are frequently called upon to assess problems, make scientific evaluations and provide management recommendations. A main goal of this course is to provide problem-solving experiences in stream assessment based on example real-world environmental questions. The assessments will provide students opportunities to address issues they may face as ecologists, engineers, managers and policy makers.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENVS 230 [Min Grade: D] or BIO 126 [Min Grade: D] or BIO 141 [Min Grade: D]

ENVS 418 Coastal Biogeochemistry 3.0 Credits
This course covers fundamental biogeochemical and ecological concepts necessary to critically examine influential and current relevant literature. Topics include eutrophication, hypoxia, ocean acidification, climate change, and greenhouse gas exchange in nearshore coastal waters such as estuaries, coastal rivers and watersheds, mangroves, seagrasses, salt marshes, wetlands, mud and sand flats, and coral reefs. Analytical tools such as stable isotopes, ecosystem models, and process measurements will be used.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 101 [Min Grade: D]

ENVS 438 Biodiversity 3.0 Credits
This course explores major patterns of biodiversity that biologists have documented across the planet. The course begins with an overview of major types of biodiversity, focusing on species diversity, and methods for measuring and analyzing biodiversity. Next it explores major patterns of biodiversity that are fundamental to ecology and conservation, and theories for the causes of biodiversity patterns.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 124 [Min Grade: D] or ENVS 230 [Min Grade: D]

ENVS 441 [WI] Issues in Global Change I: Seminar 2.0 Credits
Discusses and evaluates topics such as records of climate change, atmospheric chemistry and global warming, the greenhouse effect, ozone depletion, acid rain, decreased biodiversity, desertification, deforestation, and sea-level rise. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ENSS or major is ENVS or major is GEO and classification is Senior.

ENVS 442 Issues in Global Change II: Research 2.0 Credits
Requires students to focus on a particular change topic or issue in order to analyze it, prepare a research report, and present a final seminar.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ENSS or major is ENVS or major is GEO and classification is Senior.
Prerequisites: ENVS 441 [Min Grade: D]

ENVS 443 Issues in Global Change III: Synthesis 2.0 Credits
The purpose of this course is to provide seniors in Environmental Science and Ecology with an opportunity to make an in-depth examination of the factors causing global change in the 21st century, to analyze their own data as well as that in the literature, to synthesize new ideas and to report orally and in writing on their findings.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ENSS or major is ENVS or major is GEO and classification is Senior.
Prerequisites: ENVS 442 [Min Grade: D]

ENVS 470 Advanced Topics in Evolution 3.0 Credits
Discusses and evaluates selected topics such as population and quantitative genetics, genomics in evolutionary analysis, fitness concepts and modes of selection, species concepts and modes of speciation, evolution of development and complex adaptations, biological diversification over space and time, adaptive radiation and extinction, historical biogeography. Topics for each term will be selected based on current research and interest.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 12 credits
Prerequisites: ENVS 212 [Min Grade: D] or BIO 217 [Min Grade: D]

ENVS 497 Research 0.5-12.0 Credits
Provides guided research in ecology, earth science and environmental science.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

ENVS I199 Independent Study in ENVS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENVS I299 Independent Study in ENVS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENVS I399 Independent Study in ENVS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENVS I499 Independent Study in ENVS 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENVS T180 Special Topics in Environmental Science 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENVS T280 Special Topics in Environmental Science 0.0-12.0 Credits
Special topics offered in biodiversity, earth and environmental science. Topics include recent multidisciplinary areas of environmental concern.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENVS T380 Special Topics in Environmental Science 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENVS T480 Special Topics in Environmental Science 0.0-12.0 Credits
Special topics offered in environmental science. Topics include recent multidisciplinary areas of environmental concern.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Environmental Studies & Sustainability

Courses

ENSS 120 Introduction to Environmental Studies 3.0 Credits
This course looks at the many topics that fall under the interdisciplinary focus of environmental studies, such as biodiversity, preservation, conservation, sustainability, deforestation, environmental justice, risk society, treadmill of production, and climate change. Students will be introduced to the ideas, issues and practices linked to these concepts.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENSS 244 Sociology of the Environment 4.0 Credits
This course examines environmental problems through a sociological lens, and focuses on the ways that social practices, social structures and economic and political systems drive environmental change, degradation and preservation. We will explore the following questions: Why do humans keep re-creating environmental problems that threaten human and ecosystem survival even with the development of advanced technologies? What are the social barriers that stand in the way of solving the environmental problems of the twenty-first century? What has kept environmental movements from enjoying more success?.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENSS 275 Global Climate Change 3.0 Credits
This course provides a multidisciplinary introduction to the issue of global climate change. It focuses on the scientific evidence for climate change, its impact on natural and human systems, actions that can be taken to mitigate or adapt to climate change and the political and cultural dynamics of this issue.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENSS 283 Introduction to Environmental Policy 3.0 Credits
Introduction to researching environmental laws and regulations, local ordinances, and how to participate in the process. The course will explore the major environmental statutes and the system for policy creation and implementation in the US Government, and the importance of citizen involvement in environmental protections.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENSS 285 Introduction to Urban Planning 3.0 Credits
The urban planning profession seeks to improve the arrangement and character of the built environment: the places we live, work, and play. Planners develop strategies and designs to improve communities for the future, balancing citizen, political, financial, and environmental interests. This practice-focused course will introduce the many types of work planners do, and many local professionals who do it.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ENSS 326 Cities and Sustainability 3.0 Credits
This course will provide an overview of the issue of sustainability planning and policy for cities. Topics include how we define sustainability for cities, and how we measure its progress and impacts. The course will also cover how land reuse planning impacts the development of green space, including parks, gardens and urban agriculture, as well as green building, the green economy and the impact of sustainability planning on public health outcomes.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENSS 341 Environmental Movements in America 4.0 Credits
Focuses on key collective actors and institutions that are involved in the creation of U.S. environmental policies, including historical and cultural processes of change involving social movements, environmental advocacy organizations, foundations, and the media.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENSS 346 Environmental Justice 4.0 Credits
Focuses on the political economy of environmental injustice and the impact of social movements addressing it; impact of chemical pollutants on human health; and the scientific and legal issues surrounding the study and regulation of pollutants.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ENSS 348 Delaware River Issues and Policy 3.0 Credits
This course will examine the various elements of watershed management including the governance structure of the Delaware Basin, what science can and cannot tell us, how policies may differ by state, how toxic pollutants are managed and impacts of climate change. Also addressed are how various species are protected and the challenges of maintaining the natural world in a densely populated watershed.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.

ENSS I199 Independent Study in ENSS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENSS I299 Independent Study in ENSS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENSS I399 Independent Study in ENSS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENSS I499 Independent Study in ENSS 1.0-12.0 Credit
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENSS T180 Special Topics in Environmental Studies & Sustainability 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENSS T280 Special Topics in Environmental Studies & Sustainability 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENSS T380 Special Topics in Environmental Studies & Sustainability 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ENSS T480 Special Topics in Environ Stu & Sustainability 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Fashion Design

Courses

FASH 201 Survey of the Fashion Industry 0.0-3.0 Credits
Introduces the materials and methods used to design, develop, and market the fashion product, including current vocabulary and foundation of knowledge about industry practices and career opportunities.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FASH 211 Fashion Drawing I 3.0 Credits
Examines the fashion figure, fabrication, and conceptual design through the use of black, white, and gray media. Includes classroom drawing from a live model and weekly critiques.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: VSST 111 [Min Grade: D]

FASH 212 Fashion Drawing II 3.0 Credits
Examines fashion forms, fabrication, and conceptual design through the use of color and mixed media. Works toward the development of a personal "fashion look" and an understanding of drawing as it relates to the fashion industry. Includes live model.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FASH 211 [Min Grade: D]

FASH 230 Textiles for Fashion Design 3.0 Credits
Examines the textile manufacturing industry and the fundamental processes involved in producing fabrics made of natural or manufactured fibers. Includes basic textile terminology and production processes as well as selection and evaluation of fabrics based on aesthetics, performance and care characteristics.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is FASH.

FASH 241 Construction Skills 0.0-4.0 Credits
Develops a proficiency in basic garment construction. Emphasizes facility with industrial equipment. Introduces production techniques and an overall awareness of standards of quality.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FASH 310 Presentation Techniques 3.0 Credits
Introduces the presentation techniques and skills used for communication in the fashion industry.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (VSST 102 [Min Grade: D] or VSST 105 [Min Grade: D]) and (FASH 201 [Min Grade: D] or DSMR 103 [Min Grade: D])

FASH 311 Textile Design 3.0 Credits
Instructs the student in both traditional and digital techniques of textile design. Investigates layout, repeats, and coordinated fabric groups.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 102 [Min Grade: D] or VSST 105 [Min Grade: D]

FASH 313 Fashion Drawing for Industry 3.0 Credits
Covers sketching and specification drawing for the professional designer. Emphasizes communicating with manufacturers, pattern-makers, and assistants, regarding, garment construction, detailing, and fabrication.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FASH 210 [Min Grade: D] or FASH 310 [Min Grade: D]

FASH 314 Fashion Presentation Drawing 3.0 Credits
Requires the creation of a portfolio of original designs executed in a medium of choice. Explores various market segments of the industry and includes project reviews by critics who are specialists in these areas.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

FASH 315 Computer Aided Design for Patternmaking 0.0-3.0 Credits
Develops skills in patternmaking, markermaking, and grading, using the computer as a tool.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FASH 342 [Min Grade: D]

FASH 316 Computer Aided Design for Fashion Design 0.0-3.0 Credits
Explores the use of computers in the fashion industry and develops presentation skills using industrial and commercial software.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FASH 313 [Min Grade: D]

FASH 317 Technical Design 3.0 Credits
Technical Design is crucial in managing technical information internally and externally within a fashion design company. The student is trained in the essential skills of creating technical packages using data programs and sketching, conducting fittings, maintaining specs, and grading patterns and how to communicate information efficiently in a global fashion industry.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is FASH.
Cannot enroll if classification is Freshman or Pre-Junior or Sophomore
Prerequisites: FASH 342 [Min Grade: D]

FASH 341 Flat Pattern Design 0.0-4.0 Credits
Explores basic patternmaking techniques and manipulations and establishes comparisons between drafting and draping techniques in the development of standard slopers.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FASH 241 [Min Grade: D]

FASH 342 Draping Design 0.0-4.0 Credits
Covers garment development by the draping method. Advances skills of FASH 341.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FASH 341 [Min Grade: D]

FASH 343 Tailoring 4.0 Credits
Provides intensive investigation of materials and construction techniques used in tailoring. Uses a combination of garment production methods, including a strong emphasis on couture practices.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FASH 342 [Min Grade: D]

FASH 349 Fashion Design I 4.0 Credits
Poses fashion problems to be solved, with an emphasis on elements of design. Explores use of half-scale experimentation and development of "studies" as an aid in developing design ideas.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 204 [Min Grade: D] or VSST 304 [Min Grade: D]

FASH 350 Fashion Design II 4.0 Credits
Explores sources of inspiration and requires students to translate and develop source material into creative garments. Stresses the extension and elaboration of ideas within the knitwear market.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FASH 251 [Min Grade: D] or FASH 349 [Min Grade: D]

FASH 351 Fashion Design III 0.0-4.0 Credits
Requires development of original designs and execution incorporating draping, drafting, and flat-pattern techniques. Facilitates the development of a realistic approach to garment design in terms of industrial restrictions, and market segmentations. Includes professional critiques.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (FASH 252 [Min Grade: D] or FASH 350 [Min Grade: D]) and FASH 343 [Min Grade: D]

FASH 352 Fashion Design IV 0.0-4.0 Credits
Expands and broadens technical skills and lays the groundwork for development of the senior collection. Includes couture evening wear techniques and research processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FASH 351 [Min Grade: D]

FASH 399 Independent Study in Fashion Design 0.5-12.0 Credits
Provides individualized study in fashion design in a specialized area of study. May be repeated for credit. Department permission required.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if classification is Junior or Senior.

FASH 433 Couture Techniques 3.0 Credits
Expands and broadens technical skills and lays the groundwork for development of the senior collection. Includes couture evening wear techniques and research processes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FASH 351 [Min Grade: D]

FASH 450 Machine Knitting 3.0 Credits
Machine Knitting is an introduction to knitwear design specialization. Students learn to style and draw knit garments to develop a professional portfolio. Technical information regarding yarn analysis, stitch construction, pattern and garment construction are the focus of this class.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 9 credits
Restrictions: Can enroll if major is FASH.
Prerequisites: FASH 241 [Min Grade: D] and VSST 112 [Min Grade: D]

FASH 451 Accessory Design 3.0 Credits
This course provides students with concepts and skills to design traditional and contemporary fashion accessories with emphasis in embroidery; applique; hand painting; and clay, plastic and ceramic work.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FASH 241 [Min Grade: D]

FASH 452 Millinery Design 3.0 Credits
Familiarizes students with the techniques and processes involved in hat making. Emphasis will be placed on historical perspectives and materials.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FASH 241 [Min Grade: D]

FASH 453 Intimate Apparel Design 3.0 Credits
This course will offer an introduction to the foundations and sleepwear marketplace. Primary focus will be on the design and execution of two pieces for this market. Students will learn how to construct a bra (molded cups) and how to incorporate these details into their final looks for this market. In addition, students will learn the safe operation of the specialty sewing machines for knit construction.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FASH 251 [Min Grade: D] or FASH 349 [Min Grade: D]

FASH 464 Professional Portfolio 3.0 Credits
This course will involve preparation and execution of a finished designer portfolio for couture, 7th Avenue or the boutique American market. Included in the preparation is research of their chosen entry into the market via history, visuals and customer profile.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is FASH and classification is Senior.
Prerequisites: FASH 314 [Min Grade: D]

FASH 466 Business of Fashion 3.0 Credits
Presents the following topics in seminar fashion merchandising, retail distribution, interpreting consumer demand, merchandise assortment planning, unit and inventory control and pricing, fashion marketing and manufacturing, including the marketing process, components of the fashion industry, market evaluation, demographic and psychological factors, manufacturing components and processes, and case studies.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is FASH and classification is Senior.

FASH 467 Style and the Media 3.0 Credits
Fashion Journalism is reading and writing about all aspects of fashion, including reporting, criticism and commentary about photography related to fashion published in newspapers or magazines, displayed on websites, aired on radio and/or TV. The style of the writers and also the aspects of dress they found significant is examined.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FASH 491 Collection I 4.0 Credits
The second of a three-part series in which the student develops the senior collection. Requires the student to demonstrate the synthesis of a personal aesthetic and technical acumen.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: FASH 352 [Min Grade: D]

FASH 492 Collection II 3.0 Credits
Requires completion of senior collection and presentation in student fashion show.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FASH 491 [Min Grade: D]

FASH I199 Independent Study in Fashion Design 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FASH I299 Independent Study in Fashion Design 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FASH I399 Independent Study in Fashion Design 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FASH I499 Independent Study in Fashion Design 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FASH T180 Special Topics in Fashion Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FASH T280 Special Topics in Fashion Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FASH T380 Special Topics in Fashion Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FASH T480 Special Topics in Fashion Design 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Film & TV Production

Courses

FMTV 100 Visual Storytelling 3.0 Credits
This course explores a variety of techniques and principles used to tell stories visually. We will begin by asking, "What is a story and how might we differentiate a story told in images and sounds from one told in writing?" We will then investigate how techniques of cinematography, editing, and mise-en-scène contribute to the exposition of a story and to the articulations of its meaning.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMTV 110 Basic Cinematography 3.0 Credits
An introduction to the basics of photography and lighting for film and video production through demonstrations, lectures, screenings and hands-on use of digital video and still cameras and lighting equipment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMTV 115 Basic Editing 3.0 Credits
Theoretical and practical principles of editing using a computer-controlled and post-production system utilizing sync sound film and video material. This class is a hands-on workshop. Screenings of excerpts from feature and short films are used to demonstrate editorial concepts.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMTV 120 Basic Sound 3.0 Credits
A thorough analysis of sound theory and practical applications to give students the tools to understand how sound can be successfully recorded, edited, sweetened and re-recorded (mixed) for film and video.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMTV 130 Basic TV Studio 3.0 Credits
This course will focus on developing operational skills for all studio production facilities including camera operations and composition, microphones and audio mixers, basic lighting, teleprompter, video switcher and graphics playback.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMTV 185 TV Industry 3.0 Credits
The course is designed to provide an overview of the organizational structures and business models utilized by current television content and distribution companies. In addition to looking at the basic structure of an organization, the course will also examine the often delicate, unusual and sometimes combative inter-relationship of company divisions, competitors, advertisers and audiences. We will profile the top media companies and the industry leaders/entrepreneurs that have shaped the medium thus far and into the future. Each class will begin with a discussion of current industry.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMTV 200 Voice & Style 3.0 Credits
This is a workshop course designed to help students develop their individual voices and styles as storytellers through in-class exercises and studying the work of other filmmakers.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMTV 110 [Min Grade: D] or FMVD 110 [Min Grade: D]

FMTV 201 Portfolio Prep 1.0 Credit
Students will organize and reflect on materials in preparation for their Year II portfolio crits.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Sophomore.

FMTV 210 Intermediate Cinematography 3.0 Credits
This course provides advanced focus in cinematic concepts and techniques and their use in filmmaking. We will study and understand the qualities of light and how it affects images, and strengthen our knowledge of lens physics. We will learn to choose the appropriate lens for any given shot. We will learn how to use a light meter and other tools to correctly expose shots. Assigned projects will provide opportunities to harness all this technical knowledge in the service of creativity.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (FMTV 110 [Min Grade: D] or FMVD 110 [Min Grade: D]) and (FMTV 115 [Min Grade: D] or FMVD 115 [Min Grade: D]) and (FMTV 120 [Min Grade: D] or FMVD 120 [Min Grade: D])

FMTV 211 Intermediate Lighting 3.0 Credits
This course emphasizes learning to model figures and shape scenery with light for film and video production. We will cover methods of creating mood and atmosphere through light appropriate to the story of a particular film or program.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMTV 110 [Min Grade: D] or FMVD 110 [Min Grade: D]

FMTV 215 Intermediate Editing 3.0 Credits
This course will build upon Adobe Premiere and Avid editing principles taught in FMTV 115, with increased emphasis on editing aesthetics.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (FMTV 110 [Min Grade: D] or FMVD 110 [Min Grade: D]) and (FMTV 115 [Min Grade: D] or FMVD 115 [Min Grade: D]) and (FMTV 120 [Min Grade: D] or FMVD 120 [Min Grade: D])

FMTV 220 Intermediate Sound 3.0 Credits
This course is designed to build upon the audio production recording skills achieved in FMTV 120: Basic Sound. Students will learn how to operate advanced industry standard field recorders and mix sound for multiple set microphones, including wireless microphones, and will become adept at troubleshooting potential film production audio issues.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMTV 120 [Min Grade: D] or FMVD 120 [Min Grade: D]

FMTV 230 Intermediate TV Studio 3.0 Credits
This course is an Introduction to directing live and taped multi-camera television productions in a studio setting. The emphasis will be on developing solid, basic directing technique that will be built upon in subsequent additional courses. Additionally, the basics of producing live TV programming will be discussed.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMTV 130 [Min Grade: D] or TVPR 100 [Min Grade: D]

FMTV 240 Narrative Film 3.0 Credits
This course is designed to build upon the skills learned in Basic Cinematography (FMTV 110), Basic Sound (FMTV 120), and Basic Editing (FMTV 115) introducing additional production and post methodologies. Increased emphasis is placed upon the ability of the student to use the resources of the medium in a professional manner.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (FMTV 270 [Min Grade: D] or FMVD 202 [Min Grade: D]) and SCRP 280 [Min Grade: D]

FMTV 245 Microbudget Film 3.0 Credits
This course examines alternative production models that free filmmakers to take creative risk and work outside of traditional structures. Course includes screenings, workshops, and the making of a short film.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMTV 240 [Min Grade: D] or FMVD 215 [Min Grade: D]

FMTV 250 Documentary Film 3.0 Credits
Builds on the knowledge of cinematic language and basic production technique learned in FMTV 110. Students become familiar with documentary shooting and editing strategies and produce final documentary projects.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (FMTV 110 [Min Grade: D] or FMVD 110 [Min Grade: D]) and (FMTV 115 [Min Grade: D] or FMVD 115 [Min Grade: D]) and (FMTV 120 [Min Grade: D] or FMVD 120 [Min Grade: D])

FMTV 260 Experimental Film 3.0 Credits
This course explores experimental theses and techniques in film. Self-discovery, working through a process, and developing varied strategies are part of each student's journey that culminates in a finished experimental film.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (FMTV 110 [Min Grade: D] or FMVD 110 [Min Grade: D]) and (FMTV 115 [Min Grade: D] or FMVD 115 [Min Grade: D]) and (FMTV 120 [Min Grade: D] or FMVD 120 [Min Grade: D])

FMTV 265 Commercials and Promos 3.0 Credits
Students analyze and produce a wide variety of commercials and promos. Fundamental concepts of brand marketing are presented and utilized in the production of student's own script-to-screen commercials and promos. This history of commercials, both in the United States and worldwide, is also studied.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (FMTV 110 [Min Grade: D] or FMVD 110 [Min Grade: D]) and (FMTV 115 [Min Grade: D] or FMVD 115 [Min Grade: D]) and (FMTV 120 [Min Grade: D] or FMVD 120 [Min Grade: D])

FMTV 270 Basic Directing 3.0 Credits
This course provides students with an understanding of the role of a film director. Students focus on the development of comprehensive skills for directing technical personnel, exposure to directing styles, communicating with actors and cinematic choices.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (FMTV 110 [Min Grade: D] or FMVD 110 [Min Grade: D]) and (FMTV 115 [Min Grade: D] or FMVD 115 [Min Grade: D]) and (FMTV 120 [Min Grade: D] or FMVD 120 [Min Grade: D])

FMTV 275 Intermediate Directing 3.0 Credits
This course gives students instruction and experience in producing, interpreting, staging, directing, shooting, and live-cutting scenes in a studio. Students will experience the challenges of managing a cast and crew while simultaneously dealing with the kind of time, resource, and creative challenges that exist in the professional world.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (FMTV 270 [Min Grade: D] or FMVD 202 [Min Grade: D]) and (FMTV 230 [Min Grade: D] or TVPR 200 [Min Grade: D])

FMTV 280 Basic Producing 3.0 Credits
This course covers essential aspects of producing including script breakdowns, budgeting, scheduling, running a production, and guiding a film through post.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

FMTV 285 Media Law and Ethics 3.0 Credits
This course is an introduction to the areas of the law, current legal issues and practical legal understandings relevant to the media industry as viewed through the day-to-day professional experience of the senior media executive and/or any individual working the industry.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (FMTV 185 [Min Grade: D] or TVIE 180 [Min Grade: D]) and EAM 130 [Min Grade: D]

FMTV 291 Film & TV Internship 0.5-3.0 Credits
Students work part-time for local companies to gain professional experience.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMTV 340 Production Workshop 3.0 Credits
The Workshop is designed to provide advanced students with the skills, time and manpower necessary to successfully complete a larger fictional project. It offers students the experience of working with a group of people to create a collaborative vision.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMTV 240 [Min Grade: D] or FMVD 215 [Min Grade: D]

FMTV 345 TV Series I 3.0 Credits
Students start with scripts for multiple episodes written in SCRP 353. They do all pre-production including casting, location scouting, budgeting, scheduling, and production design. They then shoot every page of script, getting all the coverage needed to produce finished episodes for DUTV.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Prerequisites: (FMTV 110 [Min Grade: D] or FMVD 110 [Min Grade: D]) and (FMTV 115 [Min Grade: D] or FMVD 115 [Min Grade: D]) and (FMTV 120 [Min Grade: D] or FMVD 120 [Min Grade: D])

FMTV 346 TV Series II 3.0 Credits
Continued exploration of production techniques hones FMTV 345 TV Series I. Students start with scripts for multiple episodes written in SCRP 353. They do all pre-production including casting, location scouting, budgeting, scheduling, and production design. They then shoot every page of script, getting all the coverage needed to produce finished episodes for DUTV.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Prerequisites: (FMTV 110 [Min Grade: D] or FMVD 110 [Min Grade: D]) and (FMTV 115 [Min Grade: D] or FMVD 115 [Min Grade: D]) and (FMTV 120 [Min Grade: D] or FMVD 120 [Min Grade: D])

FMTV 355 DNews 3.0 Credits
This course teaches the basics of producing and writing news segments for magazine shows on broadcast and cable, and provides opportunities to hone those skills by realizing, developing, writing and producing multiple stories for DNEWS.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 2 times for 9 credits

FMTV 385 Show Business 3.0 Credits
Students in Los Angeles as part of the Drexel in LA program will learn about the business aspects of the entertainment industry through lectures and guest speakers drawn from the entertainment industry.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMTV 401 Creative Careers 3.0 Credits
The course is a mix of lecture, guest visits, and presentation of work. All students work on a common foundation of assets that can be shared with potential employers or collaborators. Emphasis is on taking concrete steps toward post-grad careers as active filmmakers.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: FMTV 340 [Min Grade: D] or FMVD 322 [Min Grade: D]

FMTV 415 TV Series Editing 3.0 Credits
This course is intended to emulate as closely as possible the experience of editing a prime-time network television series.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 2 times for 9 credits
Prerequisites: FMTV 215 [Min Grade: D] or FMVD 237 [Min Grade: D]

FMTV 495 Senior Project 3.0 Credits
The student plans and produces a long-term project during the senior year with faculty supervision. The project is expected to integrate the academic and practical knowledge the student has acquired in the area of film and TV.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 12 credits
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: FMTV 340 [Min Grade: D] or FMVD 322 [Min Grade: D]

FMTV I199 Independent Study in Film & TV 0.5-6.0 Credits
This course permits students to independently produce a project outside of coursework.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMTV I299 Independent Study in Film & TV 0.5-6.0 Credits
This course permits students to independently produce a project outside of coursework.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMTV I399 Independent Study in Film & TV 0.5-6.0 Credits
This course permits students to independently produce a project outside of coursework.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMTV I499 Independent Study in Film & TV 0.5-6.0 Credits
This course permits students to independently produce a project outside of coursework.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMTV T180 Special Topics in Film & TV 0.5-3.0 Credits
An in-depth exploration of subjects not currently covered in the required curriculum.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMTV T280 Special Topics in Film & TV 0.5-3.0 Credits
An in-depth exploration of subjects not currently covered in the required curriculum.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMTV T380 Special Topics in Film & TV 0.5-3.0 Credits
An in-depth exploration of subjects not currently covered in the required curriculum.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMTV T480 Special Topics in Film & TV 0.5-3.0 Credits
An in-depth exploration of subjects not currently covered in the required curriculum.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Film & Video

Courses

FMVD 110 Basic Shooting and Lighting 3.0 Credits
An introduction to the basics of shooting and lighting for film and video production through demonstrations, lectures, screenings and hands-on use of digital video and still cameras and lighting equipment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMVD 115 Basic Editing 3.0 Credits
Theoretical and practical principles of editing using a computer-controlled and post-production system utilizing sync sound film and video material. This class is a hands-on workshop. Screenings of excerpts from feature and short films are used to demonstrate editorial concepts.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMVD 120 Basic Sound 3.0 Credits
A thorough analysis of sound theory and practical applications to give students the tools to understand how sound can be successfully recorded, edited, sweetened and re-recorded (mixed) for film and video.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMVD 200 Acting for the Screen 3.0 Credits
This course examines the issues and techniques specific to acting for the camera. Through weekly workshops students address the limitations and relationships actors face in performing for the camera. The class explores various acting styles and schools of thought and involves extensive scene study and performance in a video setting.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMVD 202 Directing for the Screen 3.0 Credits
This course provides students with an understanding of the role of a director in film and television. Students focus on the development of comprehensive skills for directing technical personnel, exposure to directing styles, communicating with actors and cinematic choices.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FMVD 110 [Min Grade: D] and FMVD 115 [Min Grade: D] and FMVD 120 [Min Grade: D]

FMVD 206 Audio Production and Post 3.0 Credits
This course is an introduction to the creation and manipulation, of digital audio files. It is geared towards the Digital Media student, with respect to applying soundtrack elements to their images. Topics will include recording dialog, location sound recording, sound effects design, music editing, and multi-track mixing.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMVD 207 Location Sound Recording 3.0 Credits
This course will focus on training students to record quality sound for films in any location.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMVD 110 [Min Grade: D] and FMVD 115 [Min Grade: D] and FMVD 120 [Min Grade: D]

FMVD 210 Documentary Video Production 3.0 Credits
Builds on the knowledge of cinematic language and basic production technique learned in FMVD 110. Students become familiar with documentary shooting and editing strategies and produce final documentary projects.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FMVD 110 [Min Grade: D]

FMVD 215 Narrative Video Production 3.0 Credits
This course applies the basic skills learned in Screenwriting, Shooting and Lighting, Sound, Editing and Directing towards the creation of a fictional narrative film with increased emphasis on intermediate production and post-production technologies.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FMVD 110 [Min Grade: D] and FMVD 115 [Min Grade: D] and FMVD 120 [Min Grade: D] and FMVD 202 [Min Grade: D] and SCRP 280 [Min Grade: D]

FMVD 218 Intermediate Cinematography 3.0 Credits
This course provides advanced focus in cinematic concepts and techniques and their their use in electronic filmmaking.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMVD 110 [Min Grade: D] and FMVD 115 [Min Grade: D] and FMVD 120 [Min Grade: D]

FMVD 220 Experimental Video Production 3.0 Credits
This course explores experimental theses and techniques in video. Self discovery, working through a process, and developing varied strategies are part of each student's journey that culminates in a finished experimental film.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMVD 110 [Min Grade: D] and FMVD 115 [Min Grade: D] and FMVD 120 [Min Grade: D]

FMVD 226 Intermediate Sound 3.0 Credits
This course is designed to build upon the audio production recording skills achieved in FMVD 120-Basic Sound. Students will learn how to operate advanced industry standard field recorders and mix sound for multiple set microphones, including wireless microphones, and will become adept at troubleshooting potential film production audio issues.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMVD 120 [Min Grade: D]

FMVD 228 Visual Storytelling 3.0 Credits
This course explores a variety of techniques and principles that are used to tell a visual story. It asks how we might differentiate a story told in images and sounds from one told in writing and investigates how techniques of cinematography, editing, and mise-en-scène contribute to the exposition of a story and to the articulations of its meaning.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is FMVD.
Prerequisites: FMVD 110 [Min Grade: D] and FMVD 115 [Min Grade: D] and FMVD 120 [Min Grade: D]

FMVD 232 Film Action Choreography 3.0 Credits
In this course, a variety of different types of action scenes ranging from fistfights to car chases will be studied. Through screenings of successful action scenes and shot by shot analysis the student will learn the importance of camera placement and ample coverage. Through the combination of screenings and hands on action arrangement the student will gain an understanding of what is involved in a successful action sequence and have to skills to execute them.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMVD 110 [Min Grade: D] and FMVD 115 [Min Grade: D] and FMVD 120 [Min Grade: D]

FMVD 234 Legal Basics for Filmmakers 3.0 Credits
This course is designed to provide students with knowledge of basic business and legal issues in the film industry, and to develop a working understanding of intellectual property, contracts and other issues which apply to filmmaking, to assist the student in understanding the legal issues related to creative works.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMVD 235 Intermediate Lighting 3.0 Credits
Emphasizes learning to model figures and shape scenery with light for film and video production. Covers methods of creating mood and atmosphere through light appropriate to the story of a particular film or video.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FMVD 110 [Min Grade: D]

FMVD 237 Intermediate Editing 3.0 Credits
This course will build upon Adobe Premiere and Avid editing principles taught in FMVD 115-Basic Editing, with increased emphasis on editing aesthetics.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMVD 110 [Min Grade: D] and FMVD 115 [Min Grade: D] and FMVD 120 [Min Grade: D]

FMVD 242 Film Production Design 3.0 Credits
This course is designed to instruct in the techniques and methods of designing a set for film and television.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMVD 286 Producing for Features 3.0 Credits
Producing will cover all aspects associated with producing a feature film in both the Hollywood and Independent arenas.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMVD 291 Film and Video Internship 0.5-3.0 Credits
The student does a non-paying internship in the field of film and video for academic credit, working a minimum of 100 hours in a 10-week term for 3 credits. The student provides an initial informational sheet on the internship and submits a final paper on the experience. May be repeated for credit. The first time the course may be taken for 3 credits. After that, the course may be repeated, but for 1 credit each time. Department permission required.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if major is FMVD.

FMVD 305 Special Effects Make-up 3.0 Credits
Introduction to the materials and techniques used in the creation of a character or special effects make-up for film and video. Through demonstrations and hands-on projects, students learn the basics of cosmetic application and more specialized techniques.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMVD 306 Micro-budget Filmmaking 3.0 Credits
This course will prepare students to make quality films on very small budgets. We will look at how aspiring filmmakers can survive in the world after college without access to an equipment office and readily available crews. Students will examine the early work of contemporary filmmakers and apply these lessons to a 5 - 8 minute short film.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

FMVD 307 Cutting Trailers 3.0 Credits
View, analyze and produce theotrical trailers and promos, as well as study the marketing methods that drive these productions. The history of trailers will also be studied.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMVD 237 [Min Grade: D]

FMVD 310 Camera Operators Workshop 3.0 Credits
A hands-on introduction to the role of the camera operator in filmmaking.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is FMVD.
Prerequisites: FMVD 110 [Min Grade: D] and FMVD 115 [Min Grade: D] and FMVD 120 [Min Grade: D] and FMVD 218 [Min Grade: D]

FMVD 315 Audio Post Production 3.0 Credits
Sound Post-Production is a workshop that allows students to thoroughly focus on the audio portion of editing. In this course, the individual components of sound design are presented and students in order to understand how all the components work together to form a solid soundtrack.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMVD 110 [Min Grade: D] and FMVD 115 [Min Grade: D] and FMVD 120 [Min Grade: D]

FMVD 316 Post Color Correction 3.0 Credits
This course is designed to introduce students to the aesthetic and technical techniques of color grading using Blackmagic Design's DaVinci Resolve. Color Grading requires students to grasp the concepts of video scopes, color theory, and the glossary of colorist terms.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMVD 237 [Min Grade: D]

FMVD 317 Directing the Score 3.0 Credits
This course will provide the filmmaker student with the communication tools to direct a film score composer.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMVD 110 [Min Grade: D] and FMVD 115 [Min Grade: D] and FMVD 120 [Min Grade: D]

FMVD 320 Steadicam Workshop 3.0 Credits
A hands-on introduction to the use of the Steadicam as a creative production tool. The course will cover basic theory, set-up, and operation of the Steadicam with various cameras.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMVD 310 [Min Grade: D]

FMVD 322 Production Workshop I 3.0 Credits
The first of a two-course sequence in which students produce a larger scale film, in terms of crew size, production value and story.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FMVD 215 [Min Grade: D]

FMVD 323 Production Workshop II 3.0 Credits
The second of a two-course sequence in which students produce a film or video project.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Prerequisites: FMVD 322 [Min Grade: D]

FMVD 324 Visual Effects for Film Editors 3.0 Credits
This course will introduce students to commonly used techniques in visual effects using Adobe After Effects. Students will learn workflow between After Effects and both Premiere and Avid editing systems, as well as integration with Photoshop and Illustrator.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMVD 237 [Min Grade: D]

FMVD 325 Stop Motion Animation 3.0 Credits
This course will explore the technique and expressive possibilities of traditional Stop Motion Animation. Students will learn to shoot objects or models one frame at a time to create the illusion of movement and life.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMVD 110 [Min Grade: D] and FMVD 115 [Min Grade: D] and FMVD 120 [Min Grade: D]

FMVD 327 Advanced Lighting 3.0 Credits
This course expands upon lighting techniques taught in FMVD 235, Basic Lighting.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMVD 235 [Min Grade: D]

FMVD 328 New Technologies in Film 3.0 Credits
This is a hands-on course that instructs in the use of emerging technologies in the film industry.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is FMVD or major is TELE.
Prerequisites: FMVD 310 [Min Grade: B]

FMVD 341 Creating Credits and Opticals 3.0 Credits
This course is designed to present a "real world" introduction to creating open and close title sequences for film and television.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMVD 237 [Min Grade: D]

FMVD 399 Independent Project in Film and Video 0.5-12.0 Credits
Students plan and produce a project in the area of film and video with faculty supervision. May be repeated for credit. Department permission required.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if major is FMVD.
Cannot enroll if classification is Freshman

FMVD 400 Advanced Directing 3.0 Credits
This hands-on class explores the communication between actors and directors in the film industry. In a workshop setting, using professional actors, students work on scenes rotating as directors.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMVD 202 [Min Grade: D]

FMVD 401 Creative Careers 3.0 Credits
The course will be a mix of lecture, guest visits, and presentation of work. All students will work on a common foundation of assets that can be shared with potential employers or collaborators. Emphasis will be on taking concrete steps toward post-grad careers as active filmmakers.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is FMVD and classification is Senior.
Prerequisites: FMVD 323 [Min Grade: D]

FMVD 410 Running a Production Company 3.0 Credits
This course explores the practical implications of starting and running a small media production business. Emphasis will be placed on the nuts and bolts of bookkeeping, marketing, sales, strategic planning and tax compliance. Students will create a personal business plan and create marketing material promoting their business.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

FMVD 415 Advanced Editing 3.0 Credits
This course builds upon the intermediate skills taught in FMVD 237-Intermediate Editing. Students advance towards editing larger scale productions, address challenges to specific types of projects, and explore advanced techniques.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is FMVD and classification is Senior.
Prerequisites: FMVD 237 [Min Grade: B]

FMVD 430 Advanced Cinematography 3.0 Credits
This course provides students with exposure to the principles of advanced cinematography and videography both in theory and practical experiences.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMVD 230 [Min Grade: D]

FMVD 490 Directed Studies in Film and Video 0.5-12.0 Credits
Students undertake specified studies in the field of film and video with faculty supervision. May be repeated for credit. Department permission required.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

FMVD 495 Senior Project in Film and Video 3.0 Credits
The student plans and produces a long-term project during the senior year with faculty supervision. The project is expected to integrate the academic and practical knowledge the student has acquired in the area of film and video.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 9 credits
Restrictions: Can enroll if major is FMVD and classification is Junior or Senior.
Prerequisites: FMVD 323 [Min Grade: D]

FMVD I199 Independent Study in Film & Video 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMVD I299 Independent Study in Film & Video 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMVD I399 Independent Study in Film & Video 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMVD I499 Independent Study in Film & Video 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMVD T180 Special Topics in Game Film & Video 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMVD T280 Special Topics in Game Film & Video 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMVD T380 Special Topics in Game Film & Video 3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMVD T480 Special Topics in Game Film & Video 3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Film Studies

Courses

FMST 101 Film History I: Emergence 3.0 Credits
This course covers the emergence and evolution of film narrative in the first half of the 20th Century, as well as the core concepts of film analysis that help us understand this process. We will focus on the artistic and institutional factors contributing to the rise and decline of Classical Hollywood Cinema.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 102 Film History II: New Waves 3.0 Credits
This course investigates the liberation of film aesthetics in the latter half of the 20th Century, and how filmmakers of this era redefined their medium. Particular emphasis is placed on the "new waves" of filmmaking in Western Europe and the "New Hollywood" revolution that soon followed.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMST 101 [Min Grade: D]

FMST 103 Film History III: Trends 3.0 Credits
This course explores recent trends in domestic and international cinema, including the independent and multi-national filmmaking movements and ideologies that flourished around the turn of the 21st Century, as well as current developments in mainstream Hollywood cinema.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMST 102 [Min Grade: D]

FMST 105 Film History & Theory I 3.0 Credits
This course covers the emergence and evolution of film narrative in the first half of the 20th Century, as well as the core concepts of film analysis that help us understand this process. The focus will be on the artistic and institutional factors contributing to the rise and decline of Classical Hollywood Cinema as well as the major theories regarding film form.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 150 American Classic Cinema 3.0 Credits
This course explores the richness and variety of American Classic Cinema while instructing in the basic principles of cinematic storytelling.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 160 European Cinema 3.0 Credits
This course surveys European Cinema from the period immediately after World War I to the present and looks at the work of several different directors whose work is representative of some of the dominant trends that have influenced western cinema.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 204 Film Voice and Style 3.0 Credits
Imitation is the sincerest form of flattery; however, filmmakers also must develop their own unique voice and style. In this course students will undertake an in-depth study of a particular filmmaker, style, genre, or movement and submit a paper, film or project that will the summation of their research.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 205 Film History & Theory II 3.0 Credits
In this course, we will discuss the rise of Italian Neo-Realism, the French New Wave, and the so-called "Art House" film movements that contributed to the dramatic liberation of film aesthetics in the latter half of the 20th-century and to the rise of the "New Hollywood" revolution of the late sixties and seventies. We will continue looking at key works through the lens of film theory.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMST 105 [Min Grade: D] or FMST 101 [Min Grade: D]

FMST 245 Non-Western Cinema 3.0 Credits
This is a survey of what has come to be considered World Cinema that originated outside of Europe and the United States. This course examines films that are great works of cinema that express the culture from which they spring as well as the unique artistic sensibilities and idea of their directors.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 250 The Documentary Tradition 3.0 Credits
Involves intensive study of major documentary film and video works. Covers topics including propaganda, documentary's relationship to social reality, documentary aesthetics, and the problem of "thruth" in documentary.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 255 Hitchcock 3.0 Credits
A study of Hitchcock's use of cinematic techniques to tell complex, provactive stories.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 260 The Western 3.0 Credits
Explores the genre of the classic American Western. Students analyze a selection of Westerns to acquire an understanding of the human and cimematic values they embody.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 262 Film Comedy 3.0 Credits
Examines a broad selection of film comedies in search of principles that underlie successful film comedy.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 264 Russian Cinema 3.0 Credits
This course is an overview of Russian cinema of the 20th century.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 266 The Cinematographer's Art 3.0 Credits
This course examines the craft and style of some of the greatest feature film cinematographers.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 270 Controversial Films 3.0 Credits
This course examines some particularly controversial intersections of art and life in the cinema. It explores a variety of films that either addressed or incited controversies and discusses controversial topics surrounding race, ethnicity, religion, sexuality and politics as depicted in film.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 271 Sex in Film: Beyond Hollywood's Gaze 3.0 Credits
This course considers the history of the representation of sexuality in cinema. It looks especially at the international art films that brought a new sexual sophistication to the narrative film; the brief era of "porno chic" when American pornography seemed poised to challenge Hollywood; and the inner workings of the adult film industry. Finally, this course is also a critical study of the relations between narrative eroticism and forms of human expression.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 272 War Films 3.0 Credits
In this course, we will examine the cinematic representation and meaning of warfare as they pertain to the major epochs of warfare from WWII to the present.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 275 Breakthroughs of Contemporary Film Directors 3.0 Credits
This course looks at the breakthrough films that "made" the careers of their directors by setting them on a course of institutional and popular recognition. We will analyze the content and form of these films, the various social, economic, and historical forces that led to their creation, as well as the particular technical components and innovations that established these directors and their styles.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 276 Great Years in Cinema: 1999 3.0 Credits
1999 proved to be one of the greatest years in cinematic history in terms of the quality of films, the popular and critical acclaim of those films and the influence that these films would have in the years that followed. This course will examine and analyze the factors that likely contributed to the high volume of quality films released that year.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 290 Hollywoodland I 3.0 Credits
This course examines the history, culture and mythology of Hollywood through ten films, ranging from the silent era to the present, which the entertainment industry has made about itself. Topics to be covered include the growth of Los Angeles as a city, perceptions of stars and producers, the coming of sound in 1927 and the intersection of entertainment and politics. Films to be shown include "A Star is Born," "Sunset Boulevard," "The Front," "A Face in the Crowd," and other lesser-known works. Readings: "What Makes Sammy Run?," "The Last Tycoon," "The Day of the Locust," and "Once in a Lifetime.".
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 291 Hollywoodland II 3.0 Credits
This course continues to examine the history, culture and mythology of Hollywood through films the entertainment industry has made about itself. In this course, the films looked at are primarily from the 1980s on, including "The Stunt Man," "My Favorite Year," "The Comedian" and "The Artist." Also discussed: the effect of television on the film industry, the breakup of the studio system in the late 40's-early 50's, the rise of programming created for HBO and other pay cable outlets, and changing perceptions of the business itself.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMST 290 [Min Grade: D]

FMST 293 Japanese Cinema: Kurosawa 3.0 Credits
This course will be a survey of some of the major films of Akira Kurosawa, who is widely heralded as one of the greatest filmmakers of the 20th century. His films will be looked at in the context of both Japanese cinema, especially the cinema that preceded him, and world cinema in general.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 304 Film Voice and Style 3.0 Credits
Imitation is the sincerest form of flattery; however, filmmakers also must develop their own unique voice and style. In this course students will undertake an in-depth study of a particular filmmaker, style, genre, or movement and submit a paper, film or project that will the summation of their research.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 340 French New Wave 3.0 Credits
This course screens films by all five members of the French New Wave movement and examines the works of others who both influenced these five men and were also part of the aesthetic development in France during this period.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 345 Italian Neo Realism 3.0 Credits
Students are exposed to Italian Neorealism, its historical connection to Italy's post WWII, its technique of realism and its influence on later Italian and international films.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 352 The Horror Film 3.0 Credits
This course reviews the history of the horror film and its various sub-genres and analyzes the methods employed in the most successful films. Students dissect the representation of evil and the impact these films have on culture.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST 355 Contemporary Cinema 3.0 Credits
Students interpret and assess contemporary film in light of film history and aesthetics. Includes viewing and analysis of a different current film each week.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

FMST I199 Independent Study in FMST 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMST I299 Independent Study in FMST 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMST I399 Independent Study in FMST 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMST I499 Independent Study in FMST 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMST T180 Special Topics in Film Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMST T280 Special Topics in Film Studies 3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMST T380 Special Topics in Film Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

FMST T480 Special Topics in Film Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Finance

Courses

FIN 150 Financial Literacy 4.0 Credits
Financial literacy is designed to help students understand their personal financial lives. Students will be exposed to how to make everyday decisions (e.g., rent/buy a house or lease/own a car) as well as understand credit cards, student loans, consumer purchasing decisions, insurance, and other financial decisions.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

FIN 301 Introduction to Finance 4.0 Credits
Covers financial structure of a corporation, short-and long-term financial policies, sources and uses of capital funds, asset valuation, capital budgeting, and corporate growth.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (STAT 201 [Min Grade: D] or STAT 205 [Min Grade: D] or STAT 261 [Min Grade: D]) and (ACCT 115 [Min Grade: D] or ACCT 110 [Min Grade: D] or HRM 310 [Min Grade: D])

FIN 302 Intermediate Corporate Finance 4.0 Credits
Provides an in-depth treatment of long-term financing decisions, including estimation of the cost of capital, financial leverage, dividend policy, and working capital analysis.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: FIN 301 [Min Grade: C] and (STAT 202 [Min Grade: C] or STAT 206 [Min Grade: C])

FIN 321 Investment Securities & Markets 4.0 Credits
Covers stocks, bonds, other investment vehicles, and operation and
regulation of the stock market.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: FIN 301 [Min Grade: C] and (STAT 202 [Min Grade: C] or
STAT 206 [Min Grade: C])

FIN 323 Risk Management 4.0 Credits
Provides a fundamental understanding of risk and return, modern portfolio
theory, asset pricing models, performance evaluation, and the use of
derivatives to hedge and manage risk.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: FIN 321 [Min Grade: C] and (STAT 202 [Min Grade: C] or
STAT 206 [Min Grade: C])

FIN 325 Financial Institutions and Markets 4.0 Credits
Covers understanding of the financial system from the money-creation
process to the functioning of the Federal Reserve System to the role and
management of financial institutions.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: FIN 301 [Min Grade: C] and (STAT 202 [Min Grade: C] or
STAT 206 [Min Grade: C])

FIN 330 Derivative Securities 4.0 Credits
The analysis and pricing of derivative securities including futures and
options: applications to risk management and portfolio management.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: FIN 323 [Min Grade: C]

FIN 332 Investment Analysis 4.0 Credits
Introduces investment analysis, with particular emphasis on financial
statement analysis.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: FIN 321 [Min Grade: C]

FIN 335 Entrepreneurial Finance 4.0 Credits
The purpose of the course is to bring financial management decision,
tools and techniques typically applied in corporate contexts into the
realm of entrepreneurship. This course presents the importance of
understanding and applying entrepreneurial finance methods and tools to
help ensure a successful venture.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: FIN 301 [Min Grade: C]

FIN 338 Money and Capital Markets 4.0 Credits
Covers the organization and operation of the money and capital markets
and key institutional financial intermediaries.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FIN 325 [Min Grade: C]

FIN 340 Seminar in Finance 4.0 Credits
Covers current topics and selected cases in finance.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FIN 302 [Min Grade: D] and FIN 321 [Min Grade: D] and
FIN 325 [Min Grade: D]

FIN 341 Applied Portfolio Management 4.0 Credits
This course covers topics related to portfolio management. Students
will learn how to analyze industries, select securities for inclusion in
investment portfolios, and analyze portfolio performance. Students will
participate in the management of a real investment portfolio for the
duration of the course.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: FIN 321 [Min Grade: C]

FIN 342 Advanced Portfolio Management 4.0 Credits
This course covers advanced topics related to portfolio management.
Students will learn how to analyze industries and the investment potential
of individual securities in depth. They will also learn advanced methods
for analyzing portfolio performance and investment strategy. Students
will participate in the management of a real investment portfolio for the
duration of the course.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: FIN 341 [Min Grade: C]

FIN 345 Mergers & Acquisitions 4.0 Credits
The purpose of this course is to guide students to a better understanding
of mergers (forming a new company by combining with another firm)
and acquisitions (purchasing another firm) from the perspective of a
corporation. Students will analyze the process in which one firm identifies
potential other firms to take over and how to calculate the value of these
firms. Further, student will be exposed to additional issues that arise when
corporations undertake mergers and acquisitions.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: FIN 301 [Min Grade: C] and FIN 302 [Min Grade: C] and
FIN 321 [Min Grade: C]

FIN 346 Global Financial Management 4.0 Credits
Examines the investment and financing strategies of multinational corporations. Covers topics including capital acquisition in the international environment, international investment borrowing, international corporate restructuring, currency swaps and recapitalizations, hedging techniques, and international risk-management instruments.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: FIN 301 [Min Grade: C]

FIN 348 Corporate Financial Reporting to Executives 4.0 Credits
Provides decision support to the corporate executive leadership team in visualizing the short-term and long-term financial picture of the firm.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: FIN 301 [Min Grade: C] and ACCT 115 [Min Grade: C]

FIN 350 Personal Finance 4.0 Credits
Covers key personal financial documents, taxes, credit, insurance, and investments.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.

FIN 440 Credit Risk Analysis 4.0 Credits
The course focuses on the firm's credit worthiness. It is designed to allow students to experience the responsibilities of a credit analyst. Students will learn to interpret financial statements, identify a firm's financial vulnerabilities and complete a full credit risk analysis. Upon course completion, students should be able to evaluate financial statements, determine the credit strength of the firm and answer the question "do you feel comfortable lending the company money.".
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: FIN 301 [Min Grade: C] and FIN 302 [Min Grade: C] and FIN 321 [Min Grade: C] and FIN 325 [Min Grade: C]

FIN 450 Personal Wealth Management 4.0 Credits
The focus of this course will be on the logic and principles underlying personal financial management as well as implementing tools and techniques for achieving sound financial goals. Topics include: investment decision analysis, consumer credit, tax planning, actuarial opportunities, financial investment strategies, and retirement planning.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: FIN 302 [Min Grade: C] and FIN 321 [Min Grade: C]

FIN I199 Independent Study in FIN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

FIN I299 Independent Study in FIN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

FIN I399 Independent Study in FIN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

FIN I499 Independent Study in FIN 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

FIN T180 Special Topics in FIN 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

FIN T280 Special Topics in FIN 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

FIN T380 Special Topics in FIN 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit
Prerequisites: FIN 301 [Min Grade: C]

FIN T480 Special Topics in FIN 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: FIN 301 [Min Grade: C]

Food Science

Courses

FDSC 100 ServSafe 1.0 Credit
This course is designed for students who will be involved in food service, either at the institutional or commercial levels. It is also of interest to students who desire practical applications of food and kitchen sanitation and related environmental studies. This course concentrates on measures that must be taken to protect consumers from foodborne diseases and other hazards that can be caused from eating those foods. ServSafe Certification exam through the National Restaurant Association is administered.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

FDSC 120 Food and the Senses 3.0 Credits
This course is designed to help students develop their palates through understanding the different approaches to the sensory properties of food. By starting with simple ingredients and building in complexity of flavor profile, students will be introduced to the field of sensory evaluation.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

FDSC 154 Science of Food and Cooking 4.0 Credits
Covers the physical and chemical characteristics of food components including sugars, starches, proteins, and fats and their changes during preparation and cooking. Also considers the interaction of components in foods such as eggs, dairy products, meats, and cereals and the formulation of baked goods. Methods of sensory evaluation are included.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

FDSC 270 Microbial Food Safety and Sanitation 4.0 Credits
Covers topics including types, sources and growth of microorganisms in food; food spoilage; foodborne infections and intoxications and their prevention; chemical contamination; pest control and sanitation standards in foodservice operations; and FDA and local regulations.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

FDSC 350 Experimental Foods: Product Development 3.0 Credits
Covers the ingredients used in the development of new food products and the process of developing new food products. Objective and subjective testing procedures are demonstrated in laboratory. Students propose and carry out a food development project.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: FDSC 154 [Min Grade: D]

FDSC 401 Modernist Cuisine 3.0 Credits
The nexus of cuisine, gastronomy, and food science. This course explores the history, techniques, science, creative inspiration, and the new equipment that encompasses the contemporary aspect of modern cuisine (molecular gastronomy). A broad range of foods will be prepared to facilite a familiarization with the range of modernist cuisine.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CAS or major is CLSC or major is CULA or major is HOSP.
Cannot enroll if classification is Freshman
Prerequisites: CULA 115 [Min Grade: D] or CULA 120 [Min Grade: D]

FDSC 410 The Science of Wine 3.0 Credits
Wine production is a very interdisciplinary field, at the crossing of agronomy (grape growing), chemistry, microbiology (wine making), sensory science (wine tasting) and cultural studies. The class will discuss the application of each discipline to wine production, with an emphasis on how scientific knowledge and technologies have impacted wine making and wine consumption around the world, and what empirical knowledge and practices developed over centuries has brought to science. Some of the key concepts developed during the course will be experienced through tasting of synthetic solutions and wines. A field trip to local wineries will also be organized. Students must be 21 years or older prior to the first day of class.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

FDSC 450 Food Microbiology 3.0 Credits
Covers application of microbiological principles to food safety, production, nutrient quality, and spoilage.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: FDSC 270 [Min Grade: D]

FDSC 451 Food Microbiology Laboratory 2.0 Credits
Teaches laboratory techniques of food microbiology with emphasis on food production and quality assurance procedures. Should be taken with FDSC 450 concurrently. Please see the department for more information.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: FDSC 270 [Min Grade: D] (Can be taken Concurrently)
Corequisite: FDSC 450

FDSC 454 Microbiology & Chemistry of Food Safety 3.0 Credits
Provides advanced study of chemicals of food safety significance, with emphasis on the effects of compounds normal to food. Includes regulations and controls.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 103 [Min Grade: D] and FDSC 270 [Min Grade: D]

FDSC 456 Food Preservation Processes 3.0 Credits
Covers fundamentals of food processing and preservation, including techniques and methods employed to extend the useful life of food products, and the significance of changes in the composition of foods due to the processing, enzymatic activity, microbial action and chemical change.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NFS 215 [Min Grade: D] or CHEM 242 [Min Grade: D]

FDSC 458 Nutritional Impact of Food Processing Methods 3.0 Credits
Covers the effect of processing on foods, emphasizing nutritional and chemical aspects. Includes topics such as synthetic foods, food additives, current food processing methods, nutritional policy, consumer dietary patterns, and food product trends.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: (FDSC 154 [Min Grade: D] and NFS 215 [Min Grade: D])

FDSC 460 Food Chemistry 3.0 Credits
Covers physicochemical properties of food constituents, including the application of underlying scientific principles to the processing of foods and biological materials.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 242 [Min Grade: D] and CHEM 103 [Min Grade: D]

FDSC 461 Food Analysis 3.0 Credits
Provides analysis of foods and biological samples, with emphasis on their chemical composition and physicochemical properties.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 103 [Min Grade: D] and CHEM 242 [Min Grade: D]
Corequisite: FDSC 460

FDSC 468 Functional Foods 3.0 Credits
This course covers a range of functional foods and food components, their health conferring benefits, mechanisms of actions, and possible applications in the food industry.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: FDSC 154 [Min Grade: D] and NFS 215 [Min Grade: D]

FDSC 487 Food Engineering 3.0 Credits
This course deals with understanding and implementing basic engineering concepts to solve quantitative problems in food engineering and processing. Concepts such as units and dimension, mass and energy balance, heat transfer, mass transfer, psychometrics and fluid flow will be covered.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 104 [Min Grade: D] and MATH 102 [Min Grade: D]

FDSC 490 Seminar in Food Science 1.0 Credit
Current topics in food science will be studies with presentations by invited speakers and students. This course may be repeated for credit.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 3 times for 3 credits
Restrictions: Cannot enroll if classification is Freshman or Junior or Pre-Junior or Sophomore

FDSC 491 Senior Project I 2.0 Credits
Students will identify a research problem, synthesize a literature review of the problem and then develop a research proposal to be presented both in written form and defended orally.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: FDSC 350 [Min Grade: D]

FDSC 492 Senior Project II 2.0 Credits
Students will carry out the research protocol developed in FDSC 491. The data generated will be analyzed to answer the research questions posed in FDSC 491. The final results will be presented both orally and in written form.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: FDSC 491 [Min Grade: D]

FDSC I199 Independent Study in FDSC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

FDSC I299 Independent Study in FDSC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

FDSC I399 Independent Study in FDSC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

FDSC I499 Independent Study in FDSC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

FDSC T180 Special topics in FDSC 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

FDSC T280 Special topics in FDSC 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

FDSC T380 Special topics in FDSC 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

FDSC T480 Special topics in FDSC 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

French

Courses

FREN 101 French I 4.0 Credits
Introductory French. Includes listening, speaking, reading, and writing. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

FREN 102 French II 4.0 Credits
Continues FREN 101. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: FREN 101 [Min Grade: C]

FREN 103 French III 4.0 Credits
Continues FREN 102. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: FREN 102 [Min Grade: C]

FREN 201 French IV 4.0 Credits
Intermediate French. Includes grammar review, listening, speaking, and reading, with individual audiolingual practice. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: FREN 103 [Min Grade: C]

FREN 202 French V 4.0 Credits
Continues FREN 201. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: FREN 201 [Min Grade: C]

FREN 310 Advanced Writing and Speaking 4.0 Credits
French 310 provides advanced practice in written and oral communication, including journalistic, professional, and creative writing. Examines contemporary cultural contexts through media and news. Taught in French.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: FREN 202 [Min Grade: C]

FREN 320 Introduction to Language for the Professions 3.0 Credits
This course provides an introduction to communication skills in areas such as contemporary business, health, and law in a culturally sensitive fashion. The content of this course may change every term it is offered and is repeatable for credit. Taught in French.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: FREN 310 [Min Grade: C]

FREN 330 Introduction to Identities and Communities 3.0 Credits
This course provides an introduction to the analysis of individual and collective identities, including issues of gender, sexual orientation, race, ethnicity, class, nationality, and religion. The content of this course may change every term it is offered and is repeatable for credit. Taught in French.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: FREN 310 [Min Grade: C]

FREN 340 Introduction to Power and Resistance 3.0 Credits
This course provides an introduction to the analysis of power relations and issues of (in)equality rooted in contemporary political and socio-economic systems. The content of this course may change every term it is offered and is repeatable for credit. Taught in French.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: FREN 310 [Min Grade: C]

FREN 350 Introduction to Language, Media, and Society 3.0 Credits
This course provides an introduction to the role of language and media in society, including sociolinguistics, gender, media studies, and communication. The content of this course may change every term it is offered and is repeatable for credit. Taught in French.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: FREN 310 [Min Grade: C]

FREN 410 Advanced Grammar and Translation 3.0 Credits
This course provides advanced grammar instruction and fosters translation and communication skills within a contemporary cultural context. The content of this course may change every term it is offered and is repeatable for credit. Taught in French.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: FREN 310 [Min Grade: C] and (FREN 320 [Min Grade: C] or FREN 330 [Min Grade: C] or FREN 340 [Min Grade: C] or FREN 350 [Min Grade: C])

FREN 420 Advanced Studies in Language for the Professions 3.0 Credits
French 420 provides an advanced communication skills in areas such as contemporary business, health, and law in a culturally sensitive fashion. The content of FREN 420 may change every term it is offered and is repeatable for credit. Taught in French.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: FREN 310 [Min Grade: C] and (FREN 320 [Min Grade: C] or FREN 330 [Min Grade: C] or FREN 340 [Min Grade: C] or FREN 350 [Min Grade: C])

FREN 430 Advanced Studies in Identities and Communities 3.0 Credits
French 430 provides an advanced analysis of individual and collective identities, including issues of gender, sexual orientation, race, ethnicity, class, nationality, and religion. The content of FREN 430 may change every term it is offered and is repeatable for credit. Taught in French.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: FREN 310 [Min Grade: C] and (FREN 320 [Min Grade: C] or FREN 330 [Min Grade: C] or FREN 340 [Min Grade: C] or FREN 350 [Min Grade: C])

FREN 440 Advanced Studies in Power and Resistance 3.0 Credits
French 440 provides an advanced analysis of power relations and issues of (in)equality rooted in contemporary political and socio-economic systems. The content of FREN 440 may change every term it is offered and is repeatable for credit. Taught in French.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: FREN 310 [Min Grade: C] and (FREN 320 [Min Grade: C] or FREN 330 [Min Grade: C] or FREN 340 [Min Grade: C] or FREN 350 [Min Grade: C])

FREN 450 Advanced Studies in Language, Media, and Society 3.0 Credits
French 450 provides an advanced analysis of the role of language and media in society, including sociolinguistics, gender, media studies, and communication. The content of FREN 450 may change every term it is offered and is repeatable for credit. Taught in French.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: FREN 310 [Min Grade: C] and (FREN 320 [Min Grade: C] or FREN 330 [Min Grade: C] or FREN 340 [Min Grade: C] or FREN 350 [Min Grade: C])

FREN 480 French Minor Thesis Course 0.5-4.0 Credits
Independent research study on a topic selected by the student. Independent study is supervised by a faculty member and guided by a plan of study. At the end of the course, the student is required to produce a paper and oral defense on the topic of his paper.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

FREN I199 Independent Study in FREN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

FREN I299 Independent Study in FREN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

FREN I399 Independent Study in FREN 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

FREN I499 Independent Study in FREN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

FREN T180 Special Topics in French 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

FREN T280 Special Topics in French 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

FREN T380 Special Topics in French 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

FREN T480 Special Topics in French 0.5-12.0 Credits
Recommended for French minors and for students with proficiency status. Offered all terms. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 96 credits

Game Art & Production

Courses

GMAP 101 Game Design Lab I 3.0 Credits
This course will cover an overview of fundamental image creation and editing tools, like Adobe Photoshop and Illustrator, in the framework of creative experimentation with analog game design exercises using a combination of digital and physical fabrication skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

GMAP 102 Game Design Lab II 3.0 Credits
This course will cover an overview of the fundamental design skills of digital games using a variety of game engines, including interactive text, 2d and 3d game engines, and grey-boxing with primitive shapes in-engine and modeling tools, exploiting the systems and existing asset libraries available for rapid experimentation.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

GMAP 121 Game Playtesting 1.0 Credit
This course introduces various topics under the labels of user research (UR), user experience (UX), usability testing, and quality assurance (QA) software testing, and related fields, as they apply to game development. Students will become familiar with general approaches and techniques through in-class lectures and participation in practical testing of active game projects by student teams in other courses.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 4 times for 5 credits

GMAP 123 Basic Portfolio 1.0 Credit
This course focuses on the basics of portfolio creation, editing, and presentation while examining portfolio examples of current professionals in a variety of game development roles that can serve as models for student portfolio development.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

GMAP 211 Game User Interface Design 3.0 Credits
This course covers the design, prototyping, and evaluation of graphical user interfaces for digital games by exploring topics such as human capabilities, input technologies, heuristic evaluation, and design methods, principles and rules. Students will learn how to design aesthetically pleasing and effective game user interfaces, covering important design principles (learnability, visibility, error prevention, efficiency, and visual design) and the human capabilities that motivate them (including perception, motor skills, color vision, attention, and human error).
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

GMAP 231 Scripting for Game Design 3.0 Credits
This course explores modern game engine scripting languages that are event-driven, control the art assets, provide multiplayer communication, and database access.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: CS 140 [Min Grade: D] or CS 171 [Min Grade: D]

GMAP 246 Advanced Portfolio 1.0 Credit
This course focuses on building skills for the career-long practice of producing and maintaining a professional creative portfolio while allowing the students the opportunity to create or refine additional student-driven portfolio work that synthesizes their skills and experience from direct class assignments in their other coursework.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 4 times for 5 credits
Prerequisites: GMAP 123 [Min Grade: D]

GMAP 260 Overview of Computer Gaming 3.0 Credits
This course presents an overview of computer gaming, including its history, its foundation in traditional games and its contemporary forms. The relationship among genres, platforms and audiences are examined and critical evaluation skills are developed.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

GMAP 301 Game History 3.0 Credits
This course explores the history of video games from their analog roots and examines the video game industry from the earliest arcade entertainments to modern digital distribution networks. It will investigate the people who made technical, design, and business decisions that have had lasting, industry-wide effects that are still with us today.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

GMAP 341 Serious Games 3.0 Credits
This course explores development of games for education. Goals include understanding and appreciating the psychology of play and the principles of game design in developing educational games.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: GMAP 377 [Min Grade: D]

GMAP 342 Experimental Games 3.0 Credits
This course explores new ideas and innovative gameplay through constraints of team size and shortened development cycles.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: GMAP 377 [Min Grade: D]

GMAP 345 Game Development Foundations 3.0 Credits
This course introduces students to the computer game design process. Students also learn how the individual skills of modeling, animation, scripting, interface design and storytelling are coordinated to produce interactive media experiences.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (ANIM 141 [Min Grade: D] or DIGM 141 [Min Grade: D] or ANIM 145 [Min Grade: D] or CS 265 [Min Grade: D]) and (DIGM 260 [Min Grade: D] or GMAP 260 [Min Grade: D])

GMAP 360 Game Design from the Player's Perspective 3.0 Credits
This course is an introduction to game design from a player's perspective. Students will experience a variety of games and analyze them with respect to the use of game design principles and their consequences for game play.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

GMAP 367 Character Animation for Gaming 3.0 Credits
This course focuses on character animation techniques for real-time graphics, including cyclical animations, procedural animation, motion capture and integration into game engines.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: GMAP 231 [Min Grade: D] (Can be taken Concurrently)ANIM 211 [Min Grade: D] and (GMAP 345 [Min Grade: D] or CS 345 [Min Grade: D]

GMAP 368 Artificial Intelligence in Gaming 3.0 Credits
This course teaches the use and integration of state machines into game engines, as well as other methods for creating and controlling Non Player Characters (NPCs).
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (GMAP 345 [Min Grade: D] or CS 345 [Min Grade: D]) and (CS 172 [Min Grade: D] or GMAP 231 [Min Grade: D])

GMAP 369 Mobile Game Development 3.0 Credits
This course explores development of games for mobile platforms. Specifically addressed will be platform issues such as processor speed, screen resolution, user interface and memory.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: GMAP 345 [Min Grade: D] or CS 345 [Min Grade: D]

GMAP 377 Game Development: Workshop I 3.0 Credits
This course examines the roles of the executive producer and the development team in taking a computer game from concept to design document through production. Students will work in small teams to research andplan a production effort that results in a pre-production prototype.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: GMAP 345 [Min Grade: D] or DIGM 345 [Min Grade: D] or CS 345 [Min Grade: D]

GMAP 378 Game Development: Workshop II 3.0 Credits
This course provides an environment in which the pre-production of GMAP 377 Game Development: Workshop I can be taken through a full production effort. Students work in small teams to bring a selected prototype to completion.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: GMAP 377 [Min Grade: D] or DIGM 361 [Min Grade: D]

GMAP 395 Advanced Game Design and Production 3.0 Credits
This course will step through the various modules of game engines, enabling students to gain access to real-time shaders and materials, particle systems and animation techniques.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: GMAP 345 [Min Grade: D] or CS 345 [Min Grade: D]

GMAP 399 Independent Project in Game Art and Production 0.5-12.0 Credits
Supervised planning and execution of a project in the area of Game Art and Production.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

GMAP I199 Independent Study in Game Art and Production 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

GMAP I299 Independent Study in Game Art and Production 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

GMAP I399 Independent Study in Game Art and Production 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

GMAP I499 Independent Study in Game Art and Production 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

GMAP T180 Special Topics in Game Art and Production 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

GMAP T280 Special Topics in Game Art and Production 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

GMAP T380 Special Topics in Game Art and Production 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

GMAP T480 Special Topics in Game Art and Production 3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

General Business

Courses

BUSN 101 Foundations of Business I 4.0 Credits
Introduces the fundamental structures and functions of business organizations and the opportunities for career advancement within such organizations. Develops relevant business skills for professional success, emphasizing teams, communication, and real-world examples.
College/Department: LeBow College of Business/General Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Freshman or Sophomore .

BUSN 102 Foundations of Business II 4.0 Credits
Exposes students to the external environments (local, national, and international) within which business organizations operate. Continues to build on important managerial and communication issues.
College/Department: LeBow College of Business/General Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Freshman or Sophomore .
Prerequisites: BUSN 101 [Min Grade: D]

BUSN 103 Advanced First Year Business Seminar 2.0 Credits
Continues to address topics and professional development introduced in the Foundations of Business I and II courses. Further develops student's knowledge and skills in a variety of areas, which may include effective boardroom presentations, individual financial strategy, leadership issues, corporate communication, career management and decision making.
College/Department: LeBow College of Business/General Business
Repeat Status: Can be repeated 2 times for 4 credits

BUSN 111 Foundations for Business 4.0 Credits
Provides an integrated foundation for future business courses. Orients transfer and evening students to the main disciplines and functions of business, in both the internal and external environments; enables hands-on analysis of information and decision-making in a competitive arena; and provides an opportunity to develop teamwork and to enhance communication, presentation, and other management skills. This course cannot be used as part of your degree requirements if you were enrolled in the BUSN 101 Foundations of Business I and BUSN 102 Foundations of Business II sequence.
College/Department: LeBow College of Business/General Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

BUSN 112 [WI] Career Management Business Residency 4.0 Credits
Provides students with a practical framework for career planning through the use of career assessments, interactive exercises, and personal reflections. Students will investigate viable career paths, analyze internal and external motivators, and enhance their communication, leadership, and presentation skills through an online simulation, electronic portfolio, and employer site visit. This is a writing intensive course.
College/Department: LeBow College of Business/General Business
Repeat Status: Not repeatable for credit

BUSN 200 Introductory Seminar in Business Research 4.0 Credits
This course provides an overview of methods used in business research. It will cover the development of research questions and hypotheses, research design and methods used in business, and the analysis and interpretation of data.
College/Department: LeBow College of Business/General Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Freshman or Sophomore .

BUSN 211 Peer Mentoring & Leadership Practicum 2.0 Credits
This course is designed to highlight and develop mentoring and leadership skills required to guide and assist incoming freshmen in their transition to college. Students will develop critical thinking as it relates to leadership and the integration of those skills. The course is experiential in nature as students will immediately look to apply knowledge gained within the course.
College/Department: LeBow College of Business/General Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Sophomore.
Prerequisites: UNIV 101 [Min Grade: B]

BUSN 430 Mentoring & Leadership Development Practicum 2.0 Credits
The role of the Peer Mentor is one of a role-model, tutor and trusted colleague. This course is designed to teach mentoring skills required by Teaching Assistants in BUSN 101 and for early career managers.
College/Department: LeBow College of Business/General Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FIN 301 [Min Grade: B] and ACCT 115 [Min Grade: B] and ACCT 116 [Min Grade: B]

BUSN 431 Mentoring & Leadership Development Practicum 2.0 Credits
The role of the peer mentor is one of a role model, tutor and trusted colleague. This course is designed to teach mentoring skills required by Teaching Assistants in BUSN 102 and for early career managers.
College/Department: LeBow College of Business/General Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FIN 301 [Min Grade: B] and ACCT 115 [Min Grade: B] and ACCT 116 [Min Grade: B]

BUSN 432 Leadership & Mentoring Practicum 4.0 Credits
The role of the TA is one of a role-model, tutor and trusted colleague. This course is designed to guide and assist upperclassmen as they support BUSN 101/102 students in their initial journey into business as well as provide leadership insights and experiences that highlight theses secondary leadership roles.
College/Department: LeBow College of Business/General Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: FIN 301 [Min Grade: B] and ACCT 115 [Min Grade: B] and ACCT 116 [Min Grade: B]

BUSN I199 Independent Study in BUSN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business/General Business
Repeat Status: Can be repeated multiple times for credit

BUSN I299 Independent Study in BUSN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business/General Business
Repeat Status: Can be repeated multiple times for credit

BUSN I399 Independent Study in BUSN 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business/General Business
Repeat Status: Can be repeated multiple times for credit

BUSN I499 Independent Study in BUSN 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business/General Business
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

BUSN T180 Special Topics in BUSN 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business/General Business
Repeat Status: Can be repeated multiple times for credit

BUSN T280 Special Topics in BUSN 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business/General Business
Repeat Status: Can be repeated multiple times for credit

BUSN T380 Special Topics in BUSN 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business/General Business
Repeat Status: Can be repeated multiple times for credit

BUSN T480 Special Topics in BUSN 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business/General Business
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

General Studies

Courses

GSTD 100 Strategies for Academic Success 1.0 Credit
This course explores the learning process to assist students in achieving academic success. Self-assessments, personal reflection, and relevant electronic resources are used to foster students' development as self-directed learners. Topics include: study skills, learning strategies, personal development, academic planning and tracking, visioning, and goal setting. The goal of this course is to help improve students' efficacy in the areas of academic self-management, self-direction, and resource utilization.
College/Department: GC-3690
Repeat Status: Not repeatable for credit

GSTD 111 Learning Skills & Strategies 3.0 Credits
This course prepares traditional undergraduate students for the expectations and challenges of college life.
College/Department: GC-3690
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Freshman.

GSTD 200 Lifelong Learning Theory & Practice 3.0 Credits
Introduces theories and practical skills necessary for successful learning in a variety of environments. Covers self-efficacy development, autonomous learning, critical thinking, critical reading, learning to learn, effective researching and writing, goal setting theories, and practical strategies necessary to support learning in university, career, and personal contexts.
College/Department: GC-3690
Repeat Status: Not repeatable for credit

GSTD 201 [WI] Professional Applications of Emotional Intelligence 3.0 Credits
This course will examine emotional intelligence as applied through interpersonal communication. Particular emphasis will be placed on emotional intelligence in the workplace and in leadership. The main objective is to make students aware that intelligence and technological expertise are not enough to be successful in the workplace. This is a writing intensive course.
College/Department: GC-3690
Repeat Status: Not repeatable for credit

GSTD 302 Customer Service Theory & Practice 3.0 Credits
This course focuses on the theory of customer service and the practices that "best in class" companies apply to differentiate themselves from the competition. The course includes practical information and activities designed to teach students how to respond to customers, resolve problems, and provide quality customer service.
College/Department: GC-3690
Repeat Status: Not repeatable for credit

GSTD 303 Client Relations Management 3.0 Credits
This course introduces the skills that facilitate and enhance client relations management. Topics covered include building a trusting relationship, evaluating and managing expectations and needs, managing conflict, understanding the client's perspective, customer life cycle, consulting, serving public sector versus private sector clients, managing client relations managers, and ethical issues.
College/Department: GC-3690
Repeat Status: Not repeatable for credit

GSTD 360 Applied Organizational Research 3.0 Credits
This course presents a systematic approach to managerial methods of conducting organizational research and analysis. Students will undergo the management research process of specifying the problem; translating the problem into specific research questions; designing the data collection methodology; collecting, analyzing and interpreting data; and reporting the research results and recommendations.
College/Department: GC-3690
Repeat Status: Not repeatable for credit

GSTD 380 Advanced Special Topics in General Studies 1.0-4.0 Credit
Covers upper-level special topics of interest in General Studies. This course may be repeated for credit.
College/Department: GC-3690
Repeat Status: Can be repeated 11 times for 12 credits

GSTD 400 Practicum 3.0 Credits
Combines classroom theory with practical application at the student's worksite. Requires students to demonstrate the ability to apply classroom learning to situations benefiting a corporation. Includes an orientation, proposals, reports on works-in-progress, and a portfolio.
College/Department: GC-3690
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is GSTD and classification is Senior.

GSTD 491 Senior Project in General Studies 3.0 Credits
The senior project covers planning and execution of a capstone project that integrates the academic and practical knowledge acquired in the student's course of study. Students will complete a research proposal, a research project or an integrative portfolio.
College/Department: GC-3690
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is GSTD and classification is Senior.

GSTD I199 Independent Study in GSTD 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: GC-3690
Repeat Status: Can be repeated multiple times for credit

GSTD I299 Independent Study in GSTD 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: GC-3690
Repeat Status: Can be repeated multiple times for credit

GSTD I399 Independent Study in GSTD 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: GC-3690
Repeat Status: Can be repeated multiple times for credit

GSTD I499 Independent Study in GSTD 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: GC-3690
Repeat Status: Can be repeated multiple times for credit

GSTD T180 Special Topics in GSTD 1.0-4.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: GC-3690
Repeat Status: Can be repeated 11 times for 12 credits

GSTD T280 Special Topics in GSTD 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: GC-3690
Repeat Status: Can be repeated multiple times for credit

GSTD T380 Special Topics in GSTD 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: GC-3690
Repeat Status: Can be repeated multiple times for credit

GSTD T480 Special Topics in GSTD 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: GC-3690
Repeat Status: Can be repeated multiple times for credit

Geography Education

Courses

EDGE 210 Geography Education 3.0 Credits
This course is an introduction to geographic concepts, themes and elements; designed to build a foundational understanding and analytical tools to examine the world from a geographic perspective. The course emphasizes the unique qualities of world regions, and the spatial interaction of people, elements, and regions, as well as major regional and global problems and prospects.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDGE 211 Geography Education: Teacher Laboratory 1.5 Credit
A teaching methods and techniques laboratory designed to prepare pre-service PK-12 teachers to effectively help their future students better understand and analyze their world utilizing geographic concepts, themes and elements. The weekly labs correspond directly to the content represented in EDGE210: Geography Education.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDGE 210 [Min Grade: D]

EDGE I199 Independent Study in EDGE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDGE I299 Independent Study in EDGE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDGE I399 Independent Study in EDGE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDGE I499 Independent Study in EDGE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDGE T180 Special topics in EDGE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDGE T280 Special topics in EDGE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDGE T380 Special topics in EDGE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDGE T480 Special topics in EDGE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

Geoscience

Courses

GEO 101 Physical Geology 4.0 Credits
This course is an introduction to geology emphasizing the role of plate tectonics. Topics include formation of minerals, igneous, sedimentary, and metamorphic rocks, volcanoes, earthquakes, depositional environments, and geological hazards. Labs focus on mineral and rock identification, map skills, and 3D visualization.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

GEO 102 History of the Earth 4.0 Credits
The history of the earth and the evolution of life on earth are examined. Geological and biological processes that allow us to reconstruct the past are emphasized. Topics include geologic time, plate tectonics, and the nature of the fossil record. Lab exercises include hands-on fossil identification and the use of fossils as tools to explore the history of the earth.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

GEO 103 Introduction to Field Methods in Earth Science 2.0 Credits
This is an introductory course in earth science that provides experience with the fundamental skills and methods for the field study of the earth and earth processes.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

GEO 111 Natural Disasters 3.0 Credits
This course is an overview of natural disasters and hazards. Students will learn the geology behind major natural disasters and how society best mitigates risk. Topics include volcanoes, earthquakes, tsunamis, hurricanes, and floods. Students will review case studies of past (and any concurrent) natural disasters through journal articles and media coverage.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

GEO 201 [WI] Earth Systems Processes 3.0 Credits
Students will examine local and global environmental changes from an earth systems perspective. Important concepts include feed-back loops, tipping points, the "butterfly effect," and geological time. From a geological perspective, students will examine: natural and anthropogenic climate change; soil degradation; sea-level rise; plate tectonics; and natural hazards, such as coastal storms, levee breaks, earthquakes, tsunamis, landslides and more.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

GEO 205 Dinosaurs and Their World 3.0 Credits
An introduction to dinosaur paleontology, this course focuses on the scientific method as applied to dinosaur studies. Topics include dinosaur evolution, the history of dinosaur research, an overview of dinosaurs, and birds as living dinosaurs. This is suitable for all majors.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

GEO 207 Introduction to Oceanography 3.0 Credits
This course provides a topics-based approach to the field of Oceanography and its disciplines. Provides a solid understanding of the discipline of oceanography and a foundation to pursue further advanced topics in oceanography or to learn about how our planet works.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

GEO 215 Mineralogy 4.0 Credits
In this course, students will study mineralogy and optical mineralogy, with a focus on describing minerals within their geologic context. The foundations of mineralogy will be covered, including: crystallography, chemical bonding, controls on mineral structure, mineral stability, and crystal growth. Students will learn physical and chemical analytical methods to examine mineral composition and structure. Hand-sample identification will be emphasized in the laboratory component. In the field, students will learn to identify rock-forming minerals within the context of historical geological events.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 101 [Min Grade: D]

GEO 301 Advanced Field Methods in Earth Science 3.0 Credits
This skills course focuses on fundamental and commonly used geoscience field techniques. Students will learn surface and subsurface mapping, coring techniques and core analysis, remote sensing techniques, and sampling techniques. This course builds on GEO 103 and prepares students for advanced field studies.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: (GEO 101 [Min Grade: D] or CAEE 212 [Min Grade: D]) and GEO 103 [Min Grade: D]

GEO 306 Environmental Geology 4.0 Credits
Students in this course will focus on interactions between humans and the geosphere. Students will develop an understanding of a broad range of natural and human-induced geohazards, from earthquakes and tsunamis to industrial pollution and anthropogenic climate change. Regional examples will be emphasized, such environmental industrial contamination and remediation efforts in the Delaware Valley and hydraulic fracturing for natural gas in Pennsylvania.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: GEO 101 [Min Grade: D] or CAEE 212 [Min Grade: D]

GEO 309 Geochemistry 4.0 Credits
This course is a topics-based approach to the field of geochemistry with emphasis on aqueous systems, both marine and freshwater. Topics include: composition of the earth and oceans; chemical equilibrium; solubility; thermodynamics; oxidation-reduction reactions; organic geochemistry; isotope geochemistry; contaminant geochemistry; applications of geochemistry; consequences of weathering; composition of surface waters; geochemical modeling; and selected areas of interest.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 103 [Min Grade: D] or CHEM 123 [Min Grade: D] or CHEM 102 [Min Grade: D]

GEO 312 Sedimentology and Stratigraphy 3.5 Credits
This course focuses on clastic and carbonate depositional environments and processes, stratigraphic principles, the construction of the stratigraphic columns, and sedimentary basin analysis.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: GEO 101 [Min Grade: D] or CAEE 212 [Min Grade: D]

GEO 320 Invertebrate Paleontology 3.5 Credits
This course focuses on the evolution of hard-bodied invertebrates from the Cambrian period to today. Topics include taxonomy, taphonomy, biostratigraphy, and paleoecology. Natural selection, functional morphology, extinction and adaption are emphasized. The lab focuses on hands-on fossil identification.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 124 [Min Grade: D] or BIO 141 [Min Grade: D] or (BIO 109 [Min Grade: D] and BIO 110 [Min Grade: D])

GEO 322 Vertebrate Paleontology 4.0 Credits
This course focuses on the evolution of vertebrates from the Cambrian Period to today. Topics include cartilaginous and bony fishes, amphibians, turtles, crocodiles, pterosaurs, birds, and mammals. Natural selection, cladistics, functional morphology, adaptation and extinction are emphasized.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: BIO 124 [Min Grade: D] or BIO 141 [Min Grade: D] or (BIO 109 [Min Grade: D] and BIO 110 [Min Grade: D])

GEO 325 Structural Geology 5.0 Credits
Students in this course will explore the physical and geometric structures within the earth's crust and the ways in which these structures reflect natural history. Mapping techniques and methods of describing stress and strain in rocks will be covered, while emphasizing visualization of three-dimensional relationships. Students will learn practical analytical techniques and foundational field skill. This course is at the heart of field geology and will prepare students for a successful summer field camp experience.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: GEO 101 [Min Grade: D] or CAEE 212 [Min Grade: D]

GEO 340 Quaternary Geology 4.0 Credits
Students in this course will examine a great variety of evidence used to establish the history and scale of environmental changes during the most recent geological time period – the Quaternary. The evidence ranges from landforms and sediments to fossil assemblages and isotope ratios. Understanding the Quaternary Period, which encompasses all of human history, is critical for the future well being of our species.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: GEO 101 [Min Grade: D] or CAEE 212 [Min Grade: D]

GEO 342 Geomorphology 4.0 Credits
Students in this course will learn how landscapes originate and develop over time, through an integrative approach that covers all of the major constructional and erosional processes. The fundamentals of sediment entrainment, transport, and deposition will be applied to landform evolution. Students will learn about the importance of geomorphology in environmental geology.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: GEO 101 [Min Grade: D] or CAEE 212 [Min Grade: D]

GEO 346 Coastal Geology 4.0 Credits
This course will furnish an understanding of the tectonic framework, hydrographic regime, climatic setting, and geological components that determine the morphology and behavior of coastlines. The response of coasts to changes in sea level, sediment supply, and human development will be examined. Fundamental geomorphic processes, such as wave-driven currents and tidal dynamics, will be covered.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: GEO 101 [Min Grade: D] or CAEE 212 [Min Grade: D]

GEO 348 Oceanography 4.0 Credits
This course provides a topics-based approach to the field of oceanography with special emphasis on marine geology and geochemistry. Provides a solid understanding of the discipline of oceanography and a foundation to pursue further advanced topics in oceanography.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: GEO 101 [Min Grade: D] or CHEM 101 [Min Grade: D] or CAEE 212 [Min Grade: D]

GEO 350 Volcanology 3.0 Credits
Volcanology is a study of the origin, properties, and processes involved in the formation and eruption of volcanoes. The student taking this course will be introduced to the various types of volcanism on Earth and in the Solar System, methods of volcano monitoring, and human and environmental impacts of volcanic eruptions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

GEO 401 Igneous and Metamorphic Petrology 5.0 Credits
Students in this course will explore the processes that control the genesis of igneous and metamorphic rocks, with emphasis on igneous processes. In the laboratory portion of the course students will learn identification and classification of petrographic specimens. Students will gain hand-on experience identifying igneous and metamorphic rocks in the field.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: (GEO 101 [Min Grade: D] or CAEE 212 [Min Grade: D]) and CHEM 102 [Min Grade: D] and GEO 215 [Min Grade: D]

GEO 412 Geology of Groundwater 4.0 Credits
Students in this course will learn the theoretical basis and practical techniques of hydrogeology. The significance of groundwater for ecosystem health, including human well-being, will be emphasized. Students will learn commonly used industrial techniques, such as hydrograph analyses, borehole measurements, and stream gauge techniques and will gain hands-on experience assessing hydrogeology in the field.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is AE or major is CIVE or major is ENVE
Prerequisites: CHEM 102 [Min Grade: D] and (MATH 239 [Min Grade: D] or MATH 123 [Min Grade: D])

GEO 418 Geophysics 4.0 Credits
Students in this course will learn geophysical concepts and practical (and marketable) skills for using geophysical techniques in the field. Students will gain hands-on experience in seismic profiling, borehole logging and other techniques important in environmental consulting and the energy industry.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: (MATH 239 [Min Grade: D] or MATH 123 [Min Grade: D]) and (PHYS 153 [Min Grade: D] or PHYS 102 [Min Grade: D])

GEO 497 Research 0.0-12.0 Credits
Students pursue a specific area of research in geoscience under the direction of a geoscience faculty member. Faculty permission required.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

GEO I199 Independent Study in GEO 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

GEO I299 Independent Study in GEO 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

GEO I399 Independent Study in GEO 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

GEO I499 Independent Study in GEO 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

GEO T180 Special Topics in Geoscience 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

GEO T280 Special Topics in Geoscience 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

GEO T380 Special Topics in Geoscience 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

GEO T480 Special Topics in Geoscience 0.0-12.0 Credits
In this course, students will explore specific areas not covered in the regularly offered Geoscience courses. The course will be taught by teaching faculty members of the Geoscience Program, Drexel professors who are members of the Geoscience Faculty Committee, or by visiting professors.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

German

Courses

GER 101 German I 4.0 Credits
Introductory German. Includes listening, reading, writing, and speaking. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

GER 102 German II 4.0 Credits
Continues GER 101. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: GER 101 [Min Grade: C]

GER 103 German III 4.0 Credits
Continues GER 102. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: GER 102 [Min Grade: C]

GER 201 German IV 4.0 Credits
Intermediate German. Includes grammar review, listening, speaking, and reading. Recommended for students who wish to attain oral competence. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: GER 103 [Min Grade: C]

GER 202 German V 4.0 Credits
Continues GER 201. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: GER 201 [Min Grade: C]

GER 310 Advanced Writing and Speaking 4.0 Credits
This course provides advanced practice in written and oral communication, including journalistic, professional, and creative writing. Examines contemporary cultural contexts through media and news. Taught in German.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: GER 202 [Min Grade: C]

GER 320 Introduction to Language for the Professions 3.0 Credits
This course provides an introduction to communication skills in areas such as contemporary business, health, and law in a culturally sensitive fashion. Taught in German.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits

GER 330 Introduction to Identities and Communities 3.0 Credits
This courses provides an introduction to the analysis of individual and collective identities, including issues of gender, sexual orientation, race, ethnicity, class, nationality, and religion. The content of this course may change every term it is offered and is repeatable for credit. Taught in German.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: GER 310 [Min Grade: C]

GER 340 Introduction to Power and Resistance 3.0 Credits
This course provides an introduction to the analysis of power relations and issues of (in)equality rooted in contemporary political and socio-economic systems. The content of this course may change every term it is offered and is repeatable for credit. Taught in German.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: GER 310 [Min Grade: C]

GER 350 Introduction to Language, Media, and Society 3.0 Credits
This course provides an introduction to the role of language and media in society, including sociolinguistics, gender, media studies, and communication. The content of this course may change every term it is offered and is repeatable for credit. Taught in German.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: GER 310 [Min Grade: C]

GER 410 Advanced Grammar and Translation 3.0 Credits
German 410 provides advanced grammar instruction and fosters translation and communication skills within a contemporary cultural context. The content of GER 410 may change every term it is offered and is repeatable for credit. Taught in German.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: GER 310 [Min Grade: C] and (GER 320 [Min Grade: C] or GER 330 [Min Grade: C] or GER 340 [Min Grade: C] or GER 350 [Min Grade: C])

GER 420 Advanced Studies in Language for the Professions 3.0 Credits
This course provides advanced communication skills in areas such as contemporary business, health, and law in a culturally sensitive fashion. The content of this course may change every term it is offered and is repeatable for credit. Taught in German.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: GER 310 [Min Grade: C] and (GER 320 [Min Grade: C] or GER 330 [Min Grade: C] or GER 340 [Min Grade: C] or GER 350 [Min Grade: C])

GER 430 Advanced Studies in Identities and Communities 3.0 Credits
This course provides an advanced analysis of individual and collective identities, including issues of gender, sexual orientation, race, ethnicity, class, nationality, and religion. The content of this course may change every term it is offered and is repeatable for credit. Taught in German.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: GER 310 [Min Grade: C] and (GER 320 [Min Grade: C] or GER 330 [Min Grade: C] or GER 340 [Min Grade: C] or GER 350 [Min Grade: C])

GER 440 Advanced Studies in Power and Resistance 3.0 Credits
This course provides an advanced analysis of power relations and issues of (in)equality rooted in contemporary political and socio-economic systems. The content of this course may change every term it is offered and is repeatable for credit. Taught in German.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: GER 310 [Min Grade: C] and (GER 320 [Min Grade: C] or GER 330 [Min Grade: C] or GER 340 [Min Grade: C] or GER 350 [Min Grade: C])

GER 450 Advanced Studies in Language, Media, and Society 3.0 Credits
This course provides an advanced analysis of the role of language and media in society, including sociolinguistics, gender, media studies, and communication. The content of this course may change every term it is offered and is repeatable for credit. Taught in German.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: GER 310 [Min Grade: C] and (GER 320 [Min Grade: C] or GER 330 [Min Grade: C] or GER 340 [Min Grade: C] or GER 350 [Min Grade: C])

GER 480 German Minor Thesis Course 0.5-4.0 Credits
Independent research study on a topic selected by the student. Independent study is supervised by a faculty member and guided by a plan of study. At the end of the course, the student is required to produce a paper and oral defense on the topic of his paper.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

GER I199 Independent Study in GER 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

GER I299 Independent Study in GER 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

GER I399 Independent Study in GER 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

GER I499 Independent Study in GER 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

GER T180 Special Topics in German 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

GER T280 Special Topics in Germany 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

GER T380 Special Topics in German 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

GER T480 Special Topics in German 0.5-12.0 Credits
Recommended for German minors and for students with proficiency status. Offered all terms. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 24 credits

Global Studies

Courses

GST 101 Becoming Global: Language and Cultural Context 3.0 Credits
This course teaches ways to approach linguistic and cultural immersion as both a way of life and as a way to pursue harmony and public good among local and global citizens. Material includes units on language acculturation as self-transformation, travel and life abroad, and (re)presentation, especially around the idea of language as a signifier of foreignness and belonging.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

GST 102 Understanding Global: Markets and Governance 3.0 Credits
Introduces Global Studies students to social scientific concepts and analyses of globalization. The course examines the relation between capitalist markets and the political, economic, social, and environmental dimensions of global integration. Topics include: colonialism, nation states, gender relations, immigration, labor, and ethnic conflicts among other topics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is GST.

GST 103 Acting Global: Research Methods in Global Studies 3.0 Credits
Introduction to research and writing in Global Studies. It covers quantitative, qualitative, and mixed approaches to GST research. Students learn to use international studies research databases and the websites of international organizations. Drawing on the content areas from the four GST concentrations, students construct a research design for a topic of their choice.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

GST 221 Introduction to Global Capital and Development 3.0 Credits
This course provides an introduction to the politics of international economic relations, global capitalism, trade, and finance. The overall theme of the course is the process of globalization: what factors are leading to a single world economy tied together by technology, trade, and investment; and what factors are working to maintain a world of independent economic zones in competition. The content of this course may change every term it is offered and is repeatable for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits

GST 231 Introduction to Identities and Communities 3.0 Credits
This course provides an introduction to the analysis of individual and collective identities, including issues of gender, sexual orientation, race, ethnicity, class, nationality, and religion. The content of this course may change every term it is offered and is repeatable for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits

GST 241 Introduction to Power and Resistance 3.0 Credits
This course provides an introduction to the analysis of power relations and issues of (in)equality rooted in contemporary political and socio-economic systems. The content of this course may change every term it is offered and is repeatable for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits

GST 251 Introduction to Global Media, Arts, and Cultures 3.0 Credits
This course provides an introduction to the role of media in society, including sociolinguistics, gender, media studies, and communication. The content of this course may change every term it is offered and is repeatable for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits

GST 261 Introduction to Global Health and Sustainability 3.0 Credits
This course provides an introduction to issues of health access, technology, and environmental sustainability. The content of this course may change every term it is offered and is repeatable for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits

GST 321 Advanced Studies in Global Capital and Development 3.0 Credits
This course provides an advanced analysis of the politics of international economic relations, global capitalism, trade, and finance. The overall theme of the course is the process of globalization: what factors are leading to a single world economy tied together by technology, trade, and investment; and what factors are working to maintain a world of independent economic zones in competition. The content of this course may change every term it is offered and is repeatable for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits

GST 331 Advanced Studies in Identities and Communities 3.0 Credits
This course provides an advanced analysis of individual and collective identities, including issues of gender, sexual orientation, race, ethnicity, class, nationality, and religion. The content of this course may change every term it is offered and is repeatable for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits

GST 341 Advanced Studies in Power and Resistance 3.0 Credits
This course provides an advanced analysis of power relations and issues of (in)equality rooted in contemporary political and socio-economic systems. The content of this course may change every term it is offered and is repeatable for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits

GST 351 Advanced Studies in Global Media, Arts, and Cultures 3.0 Credits
This course provides an advanced analysis of the role of media in society, including sociolinguistics, gender, media studies, and communication. The content of this course may change every term it is offered and is repeatable for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits

GST 361 Advanced Studies in Global Health and Sustainability 3.0 Credits
This course provides an advanced analysis to issues of health access, technology, and environmental sustainability. The content of this course may change every term it is offered and is repeatable for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Restrictions: Cannot enroll if classification is Freshman

GST 400 Senior Project in Global Studies 3.0 Credits
This course is a project-based capstone that sums up the various experiences of Global Studies majors with their respective concentrations, languages, and preferred methodologies. Putting into practice what they have learned throughout their major, students will spend most of the 10 weeks working on a final project of their choice with approval and guidance from the instructor. The final outcome of this class should be a product (an academic paper, a website, a short film, an art exhibit, or similar) that students can potentially use to gain employment or acceptance into graduate school.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

GST 435 Model Organization of American States 3.0 Credits
Prepares students to participate in a model session of the Organization of American States (OAS) in Washington D.C. Covers international political economy, structure and operation of OAS, characteristics of designated country, and public speaking and debate.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 5 times for 18 credits

GST I399 Independent Study in Global Studies 1.0-12.0 Credit
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 48 credits

GST T280 Special Topics in Global Studies 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 48 credits

GST T380 Special Topics in Global Studies 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 108 credits

Graphic Design

Courses

VSCM 100 Computer Imaging I 3.0 Credits
This course explores current potentials, limitations, and issues related to use of computer software for design applications. Projects include graphics creation and manipulation; image acquisition, creation and manipulation; text creation and manipulation; typography; input and output options and control; hardware/software/system fundamentals; and troubleshooting.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

VSCM 140 Calligraphy 0.0-3.0 Credits
Covers the skills and understanding of letterforms as geometry and type, development of hand/eye skill in letter-forming, investigation of solids and voids, and use of traditional and modern tools and materials. Studio.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 110 [Min Grade: D]

VSCM 200 Computer Imaging II 3.0 Credits
Provides continued study of electronic imaging with emphasis on Graphic Design process for print and screen design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSCM 100 [Min Grade: D]

VSCM 230 Visual Communication I 4.0 Credits
Provides an overview of graphic design as an applied art. Covers the given, the formal, and the psychological aspects of graphic design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: VSST 102 [Min Grade: D] or VSST 105 [Min Grade: D] or VSST 100 [Min Grade: D] or VSST 107 [Min Grade: D]

VSCM 231 Visual Communication II 0.0-4.0 Credits
Continues VSCM 230. Covers corporate identity and explores logo development using the pictoral mark, typographic solution, and abstract interpretation as symbols of identity.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: VSCM 230 [Min Grade: D]

VSCM 232 Visual Communication III 0.0-4.0 Credits
Examines problems in graphic design on the relationship between designer and client, including solving specific situations of image-making with emphasis on the total identity of an organization, firm, or publication. Involves extensive exploration of color and imagery. Studio.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSCM 231 [Min Grade: D]

VSCM 240 Typography I 3.0 Credits
Uses the history of type as the backdrop for the introduction to the art and craft of conventional through state-of-the-art typesetting as well as the creative and extraordinary use of type. Focuses on the letter, word, and sentence. Studio/lecture.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 101 [Min Grade: D] or VSST 104 [Min Grade: D] or VSST 108 [Min Grade: D] or VSST 100 [Min Grade: D] or VSST 107 [Min Grade: D]

VSCM 241 Production 0.0-3.0 Credits
Covers traditional and electronic means of print production. Explores alternate means of production and various printing and output methods. Studio.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSCM 240 [Min Grade: D]

VSCM 242 Typography II 3.0 Credits
Continues VSCM 240. Broadens the scope to deal with the paragraph and the typeset page, with increased attention to the importance of subtleties and refinements. Explores the differing requirements of type in relationship to pictorial images.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSCM 240 [Min Grade: D]

VSCM 247 On Screen Typography 3.0 Credits
This course develops a visual sensitivity to typographical compositions on screen while expanding knowledge of current technologies.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is DIGM or major is GRDS.

VSCM 330 Visual Communication IV 0.0-4.0 Credits
Examines problems in information graphics, including signage, environmental graphic design, and exhibit design. Studio.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSCM 232 [Min Grade: D]

VSCM 331 Visual Communication V 0.0-4.0 Credits
Focuses on techniques and methods of advanced problem solving. Through a series of three projects, the student learns to analyze conceptual and contextual relationships pertinent to any visual communication assignment. Studio.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSCM 330 [Min Grade: D]

VSCM 332 Visual Communication IV 4.0 Credits
This course focuses on techniques and methods of advanced problem solving and exploration of extended identity systems. Students learn to analyze conceptual and contextual relationships pertinent to any visual communication assignment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSCM 232 [Min Grade: D] or VSCM 330 [Min Grade: D]

VSCM 333 Visual Communication V 4.0 Credits
This course focuses on information graphics, including signage, environmental graphic design, and exhibit design. Information graphics are graphic visual representations of information, data or knowledge. These graphics present complex information quickly and clearly. Studio.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSCM 332 [Min Grade: D] or VSCM 331 [Min Grade: D]

VSCM 340 Typography III 3.0 Credits
Typography III concentrates on the exploration and management of large blocks of text in specific design problems. Special emphasis will be placed on the style and readability of typographic treatments.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSCM 242 [Min Grade: D]

VSCM 345 IKI: Tamagawa-Drexel Exchange 3.0 Credits
The 12-day program is open to all University students and entails a collaboration between Drexel students and Tamagawa students in Japan as well as at Drexel (Philadelphia). In Japan, students will survey and experience the true Japan by visiting exceptional sites that exemplify the old and the new world of Japanese culture and life. The trip will balance visits between the everyday/industries and cultural sites/museums to capture a comprehensive understanding of the Japanese "IKI." In Philadelphia, each group (made of Tamagawa and Drexel students) will conduct on-site research in historical and cultural venues and neighborhoods. Students will learn about immigration history, changing cultures over generations, and the challenges that diverse communities face.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

VSCM 350 [WI] Graphic Design: 20th Century and Beyond 3.0 Credits
Concentrates on impact and significance of the graphic design profession in society through the history and movements of the profession and the work of 20th-century masters of visual communication. Students will analyze conceptual and contextual relationships and develop greater awareness of stylistic content and its relevance to the culture. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

VSCM 360 Design on Site 3.0 Credits
Weekly visits to studios of various design disciplines such as small graphic design offices, environmental graphic design firms, advertising agencies, book and magazine publishers, and website developers. A written report is due at the end of the term.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is GRDS.
Prerequisites: VSCM 232 [Min Grade: D]

VSCM 370 Experimental Publication Design 3.0 Credits
This course concentrates on exploring alternative formats and unique delivery systems for the transfer of information. Special emphasis is placed on developing appropriate imagery for the defined readership, formatting, the use of a comprehensive grid system and the development of a wayfinding system for the publication. The course will build a greater awareness of proportion, readability and information transfer, and will reinforce the use of color as a visual communication tool.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSCM 232 [Min Grade: D] and VSCM 242 [Min Grade: D]

VSCM 399 Independent Study in Graphic Design 0.5-12.0 Credits
Provides individualized study in graphic design in a specialized area of study. May be repeated for credit. Department permission required.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if major is GRDS and classification is Junior or Senior.

VSCM 430 Visual Communication VI 4.0 Credits
Continues VSCM 331. Explores three-dimensional graphic design processes and techniques for communication, including problems of scale, material, form, and function. Emphasizes package design. Includes point-of-purchase design. Studio.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSCM 331 [Min Grade: D] or VSCM 333 [Min Grade: D]

VSCM 440 Book Design 4.0 Credits
Investigates design of books, from their pre-Gutenberg origins to contemporary technology of design, binding, paper, and finishing. Includes multiple page formats, production grids, and sequential images. Lecture/studio.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSCM 333 [Min Grade: D] or WMGD 220 [Min Grade: D]

VSCM 450 Professional Portfolio 3.0 Credits
Focuses on the preparation of a professional Graphic Design portfolio. A critical process that includes the screening of completed projects, reworking or expanding projects, and reconstructing/creating final portfolio components. A formal interview presentation of the portfolio is also explored and refined.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is GRDS.
Prerequisites: VSCM 430 [Min Grade: D] or ADGD 320 [Min Grade: D] or EVGD 320 [Min Grade: D]

VSCM 455 Electronic Portfolio 3.0 Credits
Focuses on the design and production of a web based Graphic Design portfolio using web graphics and imagery through visuals, motion and sound within the software programs of Dreamweaver & Flash.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is GRDS.
Prerequisites: VSCM 232 [Min Grade: D]

VSCM 460 Professional Practice 3.0 Credits
Covers running a design office, including basic contracts, fee structures, and the design process. Explores types of design offices; working with suppliers, printers, photographers, and illustrators; scheduling; resumes and portfolios; taxes; and marketing of graphic design services. Lecture/field work.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSCM 430 [Min Grade: D]

VSCM 478 Graphic Design Seminar: Advanced Techniques 3.0 Credits
An exploration for the subtleties that distinguish excellence in graphic design print, web and motion venues. Selections include: Advanced Typography and Electronic Portfolio.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 9 credits
Prerequisites: VSCM 340 [Min Grade: D]

VSCM 479 Graphic Design Seminar: Advanced Media 3.0 Credits
An exploration of advanced media development in Graphic Design as relevancy and currency demands. Selections include: Illustration I and II and Bookmaking.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 9 credits
Restrictions: Can enroll if major is GRDS.

VSCM 480 [WI] Graphic Design Seminar: Design Perceptions 3.0 Credits
An exploration of how graphic designers use visual communications tools and how audiences perceive them. Selections include: History of Visual Propaganda and Deconstruction Advertising. May be repeated for credit if topic varies.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 9 credits

VSCM 482 Graphic Design for Cultural Organizations 3.0 Credits
Students experience firsthand how design can enhance the mission of cultural organizations, what it takes to develop innovative outreach programs, and how to apply for grants to achieve their creative endeavors. Projects assigned will be live, and will be conducted in and outside of the classroom.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is GRDS.
Prerequisites: VSCM 430 [Min Grade: D] or ADGD 320 [Min Grade: D] or EVGD 320 [Min Grade: D] or WMGD 421 [Min Grade: D]

VSCM 485 Annual Report Design 3.0 Credits
Development and analysis of the corporate annual report as a graphic design concept and as a developed marketing tool.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSCM 340 [Min Grade: D]

VSCM 496 Senior Capstone 3.0 Credits
Requires each student to define a problem and set a goal and strategies, develop a concept, and carry out a solution. Divides time among research, design, thematic development, and final presentation. Requires instructor approval of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSCM 430 [Min Grade: D]

VSCM I199 Independent Study in Graphic Design 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

VSCM I299 Independent Study in Graphic Design 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

VSCM I399 Independent Study in Graphic Design 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

VSCM I499 Independent Study in Graphic Design 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

VSCM T180 Special Topics in Graphic Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

VSCM T280 Special Topics in Graphic Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

VSCM T380 Special Topics in Graphic Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

VSCM T480 Special Topics in Graphic Design 3.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Greek

Courses

GREC 101 Modern Elementary Greek I 4.0 Credits
The goal of this course is to provide a thorough foundation in Greek language with emphasis on communication. Small class size provides intensive practice in speaking, writing and listening comprehension.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

GREC 102 Modern Elementary Greek II 4.0 Credits
The goal of this course is to provide a thorough foundation in Greek language with emphasis on communication. Small class size provides intensive practice in speaking, writing and listening comprehension. Builds on Greek 101.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: GREC 101 [Min Grade: D]

GREC 103 Modern Elementary Greek III 4.0 Credits
The goal of this course is to provide a thorough foundation in Greek language with emphasis on communication. Small class size provides intensive practice in speaking, writing and listening comprehension. Builds on Greek 102.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: GREC 102 [Min Grade: D]

GREC 201 Intermediate Modern Greek I 4.0 Credits
Emphasizes complex grammatical and syntactical phenomena of the Modem Greek language through oral communication and texts. Students examine idiomatic nuances and special features of the language. Skills in speech, reading comprehension and writing are further developed at this level. This course counts toward the completion of a Minor in Greek Studies.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: GREC 103 [Min Grade: D]

GREC 212 Introduction to Greek Folklore 3.0 Credits
Greek folklore developed when the Greek nation was born. Using folklore, Greeks try to preserve their traditions and define their cultural identity. The class explores majors folklore topics and interpretive techniques. It provides examples and analyses of particular folklore forms, events and expressions of the Greek culture.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

GREC 225 Introduction to Greek Music & Dance 3.0 Credits
This course studies Greek music and dance historically by a) exploring performance events and b) focusing on certain music and dance genres and music groups/musicians. How does music and dance help Greeks express who they are? Formal music training and the ability to read Western staff notation is not required.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

GREC 280 Communicate in Greek: Philoxenia 3.0 Credits
The Greek word for hospitality is philoxenia, which literally means "love for the foreigners". The goal of this course is a) to provide a foundation in Greek language with emphasis on communication and b) the construction of a basic vocabulary and useful phrases students need in order to effectively communicate in simple, everyday life situations.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

GREC 313 Greek History, Economy & Society 3.0 Credits
Greece's geographic location is strategic as a connecting link between East and West and a crossroads amongst three continents that embraces various influences. Crete holds a significant tourist, economic and social role. Our goal is to understand the challenges that historically have been rising in relation to today's global world.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

GREC I199 Independent Study in GREC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

GREC I299 Independent Study in GREC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

GREC I399 Independent Study in GREC 1.0-3.0 Credit
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for NaN credits

GREC I499 Independent Study in GREC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Health & Society

Courses

HLSO 101 Intro to Health & Society 1.0 Credit
Designed as an introduction to health and health care beyond the clinical environment, this course introduces students to the intersection of health and society by means of weekly lectures on various aspects of heath and health care in relation to societal concerns and needs.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HLSO 301 Rhetoric and Reality of Health Care 3.0 Credits
The dissemination of information on health care and the language involved in the information are key factors in determining how the individual responds to health-care issues and treatment. This course will examine the nature of rhetoric as it influences health-care decisions at a societal and at an individual level.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HLSO 302 Consumer-Driven Health Care 3.0 Credits
This course focuses on how market economics and personal responsibility combine to drastically change health-care insurance saving, utilization, and satisfaction. Effects on employers, health-care providers, hospitals, and insurers are examined.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HLSO 303 Urban Health Care 3.0 Credits
Using an ecological model to analyze the special needs and issues in urban health care, students will examine the people, place, and politics o f an urban area to assess the delivery and quality of health care and will complete an analysis of a real and current urban health care delivery problem, including solutions.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HLSO 304 Health Care and Quality Improvement 3.0 Credits
Quality Improvement (QI) is a critical component of the health-care delivery system in the United States. Because errors and reliability issues have major implications, standards and measures are imperative to ensure consistency and safety. As such, this course examines existing program in place and best-industry practices.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HLSO 305 Health Promotion and Wellness 3.0 Credits
Students will study the seminal international and U.S. documents that founded the health-promotion and wellness movement and will examine the use of health promotion in improving the health of individuals, groups, communities, and populations.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HLSO 306 Human Services & Health Systems 3.0 Credits
This course introduces existing health-care systems in the United States and globally in terms of the human services that support and are supported by those systems and the effect of human services on those systems and vice versa.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HLSO 307 Disaster Planning and Health Care 3.0 Credits
This course examines the unique challenges to managers of health-care institutions, in-patient populations, providers of care, and the public health and safety systems during a disaster, as well as the complex relationships between and among government officials, first responders, and the public regarding disaster planning and during a crisis.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HLSO 308 Concepts of Injury Prevention 3.0 Credits
This course focuses on the epidemiology of injury prevention and control in the public sector. Mechanisms of injury and risk factors for accidental injury and death are examined. Various prevention strategies are reviewed, as is a look to the future of injury prevention.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HLSO 309 Health Fads, Trends & Myths 3.0 Credits
We are part of a society bombarded with fads, trends, and myths of all types, and health care is no exception. Distinguishing one from the other is a tricky business. This course will help separate fads from both trends and myths and all three from evidence-based therapies.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HLSO 310 Children & Health Care 3.0 Credits
This course will focus on a range of issues facing the health-services industry in providing care to children with the goal of better understanding and meeting the special needs and challenges from both a direct care and systematic point of view.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HLSO 313 AIDS, Society & Health Care 3.0 Credits
This course will look at the impact of HIV/AIDS on health care from a patient, provider, societal, and systems perspective. We will address how this local and national global pandemic affects societies and health services throughout the world.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HLSO 314 Human Sexuality & Health Care 3.0 Credits
This course explores human sexuality in relation to individual and societal attitudes and examines the role of health care in effectively dealing with and treating issues arising from human sexual dysfunctions, diseases, myths, phobias, and other concerns.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HLSO 319 Health Care Legislation 3.0 Credits
This course will examine the major roles played by local, state, and federal governments in the funding, delivery, oversight, and evaluation of health care services. The rationale, history, and current examples of how localities protect the public health are given.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HLSO 320 Individual and Health Care Politics 3.0 Credits
Health care policy can easily become questions of statistics and spreadsheets that obscure their origins in individual experience. Drawing upon a series of personal essays, this course will discuss the power of first-hand experience in shaping health care discourse.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HLSO 321 Health Issues and the Environment 3.0 Credits
This course provides a general review of the leading environmental health issues of today by identifying historical, political, societal, and medical approaches to safeguarding population health from the environmental, while protecting and preserving the environment.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HLSO 322 Ideologies & Health Care 3.0 Credits
This course will examine the role of political, religious, cultural, and philosophical ideologies on societies -- past and present -- in terms of the nature and delivery of health care, as well as the effects of these ideologies on the health and well-being of the societies as a whole and of the individuals comprising the societies.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HLSO 327 Health & Illness in Film 3.0 Credits
This course analyzes various films with themes and stories related to health and illness in view of conceptual theories on health and illness and copetual elements of film as a representational medium.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HLSO 329 Grief & the Healing Arts 3.0 Credits
Grief is a typical response to loss as, for example, in the loss of a human life, a body part, a former state of existence, or a valued pet. This course will examine grief and the role of the arts as a therapeutic means of dealing with grief and loss both in terms of professional health care giver and the grieving individual.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D] and ENGL 102 [Min Grade: D] and ENGL 103 [Min Grade: D]

HLSO 370 Spec Topics in Health & Society 3.0 Credits
This course covers topics of particular interest in health and society. In different terms, a variety of topics will be presented to the students. Students may repeat the same course, but not the same topic. Students majoring in health and society will have first preference.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if classification is Junior or Sophomore or Senior.
Prerequisites: ENGL 101 [Min Grade: D] and ENGL 102 [Min Grade: D]

HLSO 470 Readings in Health & Society 1.0-6.0 Credit
This course is designed to allow approved junior and senior students with cumulative GPA¿s of at least 3.0 to pursue specialized interests in specific topics in health and society under the supervision of an appropriate faculty member. This course, but not the same topic, may be repeated for credit.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 3 times for 12 credits
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: ENGL 101 [Min Grade: D] and ENGL 102 [Min Grade: D] and ENGL 103 [Min Grade: D]

HLSO 490 Senior Research Project 3.0 Credits
Designed for seniors in Health and Society, the student, in conjunction with a faculty member, selects a topic for a term project integrating knowledge acquired in the curriculum. The student develops objectives relevant to the project, critiques the literature, presents a plan for implementation, and completes the project.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is HLSC and classification is Senior.
Prerequisites: ENGL 101 [Min Grade: D] and ENGL 102 [Min Grade: D] and ENGL 103 [Min Grade: D]

Health Sciences

Courses

HSCI 125 Medical Terminology 3.0 Credits
This course is an introduction to the language of medicine intended as foundational for future study and professional practice. Students will study the basic vocabulary of medicine as well as the structure underlying that vocabulary in order to enhance future study and education.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HSCI 201 Health Assessment through the Lifespan 4.0 Credits
Course focuses on health assessment across the lifespan. The focus is on the development of interviewing skills, assessment of health status, and physical examination skills for the beginning health professional student.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ANAT 103 [Min Grade: D]

HSCI 204 Clinical Health Informatics 3.0 Credits
This course examines technology and the tools of the Internet, with a focus on the use of cyber-technology and select computer applications. The automation of data management through information systems, expert systems, and telecommunication, and the impact of technology on health care education and research are addressed.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CS 161 [Min Grade: C]

HSCI 205 Strategies for Academic Success 1.0 Credit
This course helps students to explore the learning process, to gain essential skills needed to achieve academic success and to develop the ability to make effective use of university resources. Discussion, personal reflection, and relevant electronic resources are used to foster students' development as self-directed learners. Specific attention will be given to the following topics: study skills, learning strategies, time management, academic planning, test-taking techniques, and goal-setting. The goal of this course is to help improve students' efficacy in the areas of academic self-management, self-direction, and resource utilization.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HSCI 301 Pharmacology I 3.0 Credits
This course introduces health professional students to the principles of pharmacology and drug therapies, pharmacologic-therapeutic classes of drugs and important drug information resources.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ANAT 103 [Min Grade: D]

HSCI 302 Pharmacology II 3.0 Credits
This course focuses on common drugs used in the treatment of disorders of cardiovascular, renal, respiratory and gastrointestinal systems, anti-infective and anti-inflammatory agents, immune and biologic modifiers and chemotherapeutic agents, and miscellaneous hematologic, dermatologic, ophthalmic, ant otic agents.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HSCI 301 [Min Grade: D]

HSCI 303 Pharmacology for Health Sciences 5.0 Credits
This course presents a general study of basic pharmacology in which principles underlying the actions of drugs are presented, including pharmacokinetics, drug-receptor interactions, and drug metabolism. Classes of drugs are presented as groups with "prototype" drugs in each group.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: (ANAT 103 [Min Grade: D] or BIO 201 [Min Grade: D]) and BIO 202 [Min Grade: D]

HSCI 310 Introduction to Research Methods 4.0 Credits
This course provides a comprehensive introduction to the principals and practices underlying health-related research. Topics to be covered include: the protection of human subjects; scientific misconduct; developing research questions; conducting literature searches; research designs; qualitative, quantitative, and mixed methods; critical appraisal of the health literature; and evidence-based practice.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HSCI 313 Clinical Trials Protocols 4.0 Credits
Students learn to design and implement a clinical trial protocol. Topics include experimental design, research team member roles and management of clinical trials. Special research techniques for special populations are considered. Means of preventing scientific misconduct through proper monitoring are discussed.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HSCI 310 [Min Grade: D] and STS 350 [Min Grade: D] and COM 320 [Min Grade: D]

HSCI 315 Current Issues in Health Sciences 4.0 Credits
This course is designed to discuss current issues and controversies in health science, with a focus on health-related issues attracting media attention. Topics may include: ethical dilemmas; how research informs healthcare policy; how research impacts healthcare practice; how interprofessional practice impacts patient safety and the patient experience in a culture of evidence-based practice; and cultural diversity, equity, and inclusion for underserved populations.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: COM 320 [Min Grade: D] (Can be taken Concurrently)HSCI 310 [Min Grade: D]

HSCI 320 Physiology 5.0 Credits
Presentation of organ function with emphasis on the integration of neural and humoral control mechanisms.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ANAT 101 [Min Grade: D] and ANAT 102 [Min Grade: D] and ANAT 103 [Min Grade: D] or (BIO 201 [Min Grade: D] and BIO 202 [Min Grade: D])

HSCI 325 Exercise Physiology 4.0 Credits
This course examines the acute and chronic effects of exercise on human physiology. Topical areas include neuromuscular physiology, cardiopulmonary, energy metabolism, nutrition, exercise evaluation, body composition, exercise prescription, and influence of environmental factors and clinical conditions on response to exercise.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: (ANAT 101 [Min Grade: D] and ANAT 102 [Min Grade: D] and ANAT 103 [Min Grade: D]) or (BIO 201 [Min Grade: D] and BIO 202 [Min Grade: D])

HSCI 326 Applied Anatomy and Kinesiology 5.0 Credits
This course applies the foundations of anatomy and physiology to the study of human movement, with emphasis on normal motions of the musculoskeletal system. Topical areas include musculoskeletal anatomy, neuroanatomy, biomechanics, lever systems, and the influence of musculoskeletal disease and injury in normal movement.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: (ANAT 101 [Min Grade: D] and ANAT 102 [Min Grade: D]) or (BIO 201 [Min Grade: D] and BIO 202 [Min Grade: D])

HSCI 337 Genetics and Health 4.5 Credits
This course covers the fundamentals of human genetics from a healthcare perspective. The course presents concepts of classical genetics, outlines molecular mechanisms of heredity, and explores the evolving technological advances in DNA modifications and analysis. The course emphasizes the importance of the health professional in enhancing patient understanding of the impact of genetic technology in healthcare decisions. Additional topics include genetic counseling, assisted reproductive technologies and personal genomics.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: BIO 122 [Min Grade: D]

HSCI 350 Advanced Statistics for the Health Sciences 4.0 Credits
This course is designed to provide students with an understanding of advanced statistical procedures and their applications to research designs in the health science literature. Topics include: one-way, two-way, repeated measure, and mixed factorial analyses of variance (ANOVAs); analysis of covariance (ANCOVA); multivariate analysis of variance (MANOVA); correlation; bivariate, multivariate, and logistic regressions; odds/risk ratios; exploratory factor analysis; and meta-analytic techniques.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: STS 345 [Min Grade: D]

HSCI 375 Fundamentals of Toxicology 4.0 Credits
Toxicology is an applied science that studies the adverse effects of toxins on the human body. This course is an upper level elective that introduces students to the basic principles of toxicology. The concepts covered in the course include toxicokinetics (toxin absorption, distribution, metabolism and excretion), toxicodynamics (toxin site and mechanism of action), carcinogenesis, and environmental toxicology.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ANAT 101 [Min Grade: D] and ANAT 102 [Min Grade: D] and ANAT 103 [Min Grade: D] or (BIO 201 [Min Grade: D] and BIO 202 [Min Grade: D])

HSCI 382 Pathophysiology for Health Professions 5.0 Credits
Building on a foundation of normal physiology, students are exposed to the major disturbances of normal function and the basic mechanisms involved in diseases of the major organ systems. The course includes discussion of the general aspects of the common human pathophysiological conditions and syndromes.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: (ANAT 103 [Min Grade: D] or BIO 201 [Min Grade: D]) and BIO 202 [Min Grade: D]

HSCI 410 Psychology of Physical Activity 4.0 Credits
The course is designed to introduce students to the psychology of physical activity by providing a broad overview of theoretical foundations, current research applications, and implications for health and exercise practitioners.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: PSY 101 [Min Grade: D]

HSCI 415 Musculoskeletal Pathophysiology 4.0 Credits
Introduction to the study of diseases, disorders and injuries of the musculoskeletal system. The biomechanics of connective tissue and basic science of inflammation, repair, regeneration and fibrosis are discussed. Students learn the pathogenesis, pathophysiology and clinical presentation of selected musculoskeletal disorders. The concepts of epidemiology and risk factors are considered.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ANAT 101 [Min Grade: D] and ANAT 102 [Min Grade: D] and ANAT 103 [Min Grade: D] or (BIO 201 [Min Grade: D] and BIO 202 [Min Grade: D])

HSCI 420 Advanced Anatomy 5.0 Credits
This course introduces the fundamentals of Gross Anatomy. Students will expand upon their introductory Anatomy and Physiology education by studying the human body through a regional, rather than systems approach. Topics will include the head and neck, upper and lower extremities, thorax, abdomen and pelvis.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: (ANAT 103 [Min Grade: D] or BIO 201 [Min Grade: D]) and BIO 202 [Min Grade: D]

HSCI 425 Exercise Testing and Prescription 4.0 Credits
This course covers the fundamental principles of exercise testing and prescription with an emphasis on the health-related components of physical fitness that include body composition, cardiorespiratory fitness, muscular strength, muscular endurance, and flexibility. Students use these principles to develop appropriate exercise prescriptions for healthy and selected clinical populations. Laboratory experiences provide students with opportunities to engage in exercise testing and apply exercise prescription principles in health, fitness, and sport.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HSCI 325 [Min Grade: D]

HSCI 430 Developmental Anatomy 4.0 Credits
This course expands upon the student's knowledge of anatomy by describing the events involved in the formation of organ systems in the developing human. The laboratory portion of the course examines congenital defects of the systems and discusses possible causes and treatments form a clinical perspective.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ANAT 101 [Min Grade: D] and ANAT 102 [Min Grade: D] and ANAT 103 [Min Grade: D] or (BIO 201 [Min Grade: D] and BIO 202 [Min Grade: D])

HSCI 435 Neuroscience 5.0 Credits
This course builds on students' basic knowledge of anatomy and physiology and provides a strong foundation in the structure and function of the nervous system. Clinical correlations are used throughout the course to help students understand the neuroanatomical and neurophysiological basis for the presentation of selected neurological pathologies commonly seen in clinical practice.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ANAT 102 [Min Grade: D] or (BIO 201 [Min Grade: D] and BIO 202 [Min Grade: D])

HSCI 440 Emerging Technologies in Healthcare 3.0 Credits
This course explores recent developments in the emerging fields of regenerative medicine, genomics and nanomedicine. Through lectures and assigned readings students will be introduced to fundamental concepts of stem cell biology, tissue engineering, genomic testing, and nanobiotechnology. Emphasis will be placed on clinical applications of these technologies, as well as their impact on the changing role of healthcare providers.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HSCI 470 Readings in Health Sciences 1.0-6.0 Credit
This course is designed to allow upper-class student to pursue specialized interests in specific topics in the health sciences. May be repeated twice for credit.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 2 times for 12 credits
Restrictions: Can enroll if classification is Junior or Senior.

HSCI 490 Senior Research Project 3.0 Credits
In this course, the student, with faculty supervision, selects a topic for a term project that integrates the academic and practical knowledge the student has acquired in his/her curriculum. The student develops objectives relevant to the project, critiques the literature, presents a plan for implementation, and completes the term project.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.

HSCI T180 Special Topics in Health Sciences 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

HSCI T280 Special Topics in Health Sciences 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

HSCI T380 Special Topics in Health Sciences 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

HSCI T480 Special Topics in Health Sciences 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 4 times for 24 credits

Health Services Administration

Courses

HSAD 110 The Healthcare Environment for Future Healthcare Professionals 3.0 Credits
This course provides students who wish to become future health care practitioners with an understanding of the US health care environment in which they will be working. It is designed to engage thoughtful discussions about the unique challenges and opportunities for the health care workforce of the future. Students will learn about the structure and components of the US health care delivery landscape; how that structure evolved and continues to change over time; what impact change agents have on the careers of health care professionals; and who and what influences how health care will be delivered by the next generation of health care providers.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is HSAD

HSAD 210 Health-Care Ethics I 3.0 Credits
This course addresses introductory concepts and basic issues in health-care ethics. The topics include but are not limited to decision-making, professionalism and advocacy, confidentiality, truth-telling and informed consent.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: C] or ENGL 102 [Min Grade: C] or ENGL 103 [Min Grade: C]

HSAD 212 Careers in the Health Professions 3.0 Credits
This course prepares students for career development by presenting various career options in health management introducing various methods of self-assessment and allowing students to learn about how to find a mentor, interview for a job and learn about the various career options in health management, the various professional organizations dedicated to health management careers, and the networking opportunities linked to those organizations.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HSAD 215 Physician Practice Management 3.0 Credits
This is an introductory course covering physician practice management. It will focus on the historical development of the physician practice within the United States, relevant key management concepts—organizational structure and governance, strategic planning, marketing, finance/operations, human resources, quality, and information systems, for example—as well as related future trends.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HSAD 305 Health Care Law & the Elderly 3.0 Credits
Obtaining adequate health care is a critical issue for many older adults; providing it is a significant societal challenge. Our society, as many others, has developed legislative and other social policies to address the increased frailty, both physical and/or cognitive, and the corresponding needs which accompany age. This course is designed to provide students with an understanding of how legal institutions (legislatures and courts) have responded to these needs for the ostensible protection of older adults. The instruments that these legal institutions have developed will be examined as their purposes, effectiveness, desirability, costs (economic and otherwise), and possible alternatives will be evaluated.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HSAD 308 The Affordable Care Act 3.0 Credits
This course provides an overview of current practical issues related to the Patient Protection and Affordable Care Act including issues faced by providers and employers; effects of the law on public health and politics; and funding and legal issues related to the Affordable Care Act.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: C] or ENGL 113 [Min Grade: C]

HSAD 309 Advanced Health-Care Ethics 3.0 Credits
This course builds on the foundation provided in Health Care Ethics and discusses such issues as chronic care, end of life, beginning of life, distributive justice and the right to health care.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HSAD 210 [Min Grade: C]

HSAD 310 Introduction to Health-Systems Administration 3.0 Credits
The course is designed to assist the student in understanding and preparing for the unique challenges presented to managers in a health services administration career. History and current milieu of U.S. health care are considered, as well as the ever changing infrastructure of the health-services industry.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: C] or ENGL 102 [Min Grade: C] or ENGL 103 [Min Grade: C]

HSAD 312 Development of World Health Care 3.0 Credits
This course examines a broad overview of the ongoing development of health-care policies, availability, and philosophy in a cross-section of countries by means of detailed case studies to examine both common and unique challenges and solutions, as well as global responses, to crises, such as plagues, epidemics, and natural disasters.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D] or ENGL 105 [Min Grade: D] or HUM 106 [Min Grade: D]

HSAD 313 Evolution of Health Care in the United States 3.0 Credits
This course will cover the evolution of health care in the U.S. from pre-colonial times to the present by discussing improvements in treatment institutions, modalities, philosophies and access to care, as well as the impact of major events in history on health-care discoveries on the delivery and administration of health services in the United States.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HSAD 315 Interdisciplinary Health Services 3.0 Credits
This course focuses on the role, responsibilities, scope of practice, and special concerns of health-care providers and their disciplines. The concept of interdisciplinary health-care practice is examined, along with basic concepts of teamwork and team formation.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D] or ENGL 105 [Min Grade: D] or HUM 106 [Min Grade: D]

HSAD 316 Health Care across Cultures 3.0 Credits
Living in a pluralistic society poses many challenges and opportunities. This course examines the impact of cultural upon health-care decision. Concepts such as "health," "illness," "culture," "ethnicity," will be analyzed. Traditional and alternative approaches to the delivery of health care will be addressed.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D] or ENGL 105 [Min Grade: D] or HUM 106 [Min Grade: D]

HSAD 317 Religious Views on Health Care 3.0 Credits
Addresses the impact of a person's religious beliefs on the need for and delivery of health care. Specific issues will be discussed.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D] or HUM 101 [Min Grade: D]

HSAD 318 Health and Vulnerable Populations 3.0 Credits
Vulnerable populations, those with special needs for or barriers to care, have a significant impact upon health care, both in terms of meaning and delivery. This course looks at the meaning of health through the eyes of various distinct vulnerable populations.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D] or ENGL 105 [Min Grade: D] or HUM 106 [Min Grade: D]

HSAD 319 Women and the Health Professions 3.0 Credits
This course explores women's early and controversial roles as health-care providers, the influence of government and the church on women, and key contributions by women in the health professions.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D] or HUM 101 [Min Grade: D]

HSAD 320 Managed Health Care 3.0 Credits
This course provides the student an opportunity to survey the major concepts and operational considerations of the provision of health-care services in a managed-care environment. The regulatory landscape as well as the physician/patient relationship is considered as a key to understanding the managed health care environment.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D] or ENGL 105 [Min Grade: D] or HUM 106 [Min Grade: D]

HSAD 321 Health-Care Human Resources 3.0 Credits
An introduction to the basic principles of human-resource management and their practical application in today's complex health-care organization. This course examines the role of human resources as a strategic partner within the organization.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HSAD 310 [Min Grade: C] and HSAD 334 [Min Grade: C]

HSAD 322 Health-Care Law 3.0 Credits
Provides an overview of the major laws affecting health-care professionals and examines the current legal climate in health care.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: C] or ENGL 102 [Min Grade: C] or ENGL 103 [Min Grade: C]

HSAD 323 Introduction to Long-Term Care Administration 3.0 Credits
This course covers organization, administrative of long term care services and post-acute services addressing the needs of the elderly and disabled populations. Long term care and post-acute care involves a description of the continuum of care, the types of providers and the range of services including nursing facilities, assisted living, housing, community-based services, and informal care giving. Also covered are the issues affecting integration across the continuum.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: C] or ENGL 111 [Min Grade: C] or ENGL 102 [Min Grade: C] or ENGL 112 [Min Grade: C] or ENGL 103 [Min Grade: C] or ENGL 113 [Min Grade: C]

HSAD 324 Health Technology and Ethical Responsibility 3.0 Credits
Developments in health care technology challenge many of our common assumptions about basic concepts such as health, disease, and normality. This course encourages students to consider some of the issues raised by changing health technology.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: HSAD 210 [Min Grade: C] or PHIL 321 [Min Grade: C]

HSAD 325 Issues in Health Care System 3.0 Credits
This course provides the student with the opportunity to analyze management problems that are of current importance in today's health-care industry on a national and international level.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D] or ENGL 105 [Min Grade: D] or HUM 106 [Min Grade: D]

HSAD 326 Holism and Health Care 3.0 Credits
Details the development of medicine from the late nineteenth century to the present in view of the corresponding rise of interest in a holistic approach to health care by means of alternative and complementary medicine in relation to traditional medical practices.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D] or ENGL 105 [Min Grade: D] or HUM 106 [Min Grade: D]

HSAD 327 Partnerships in Health Care 3.0 Credits
Addresses health service as a collaborative venture identifying the primary stakeholders and partners in the administration of health care including clinicians, administrators, institutions, industry, private and governmental agencies, and the patient. In addition, practical strategies for developing effective partnerships are explored.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D] or ENGL 105 [Min Grade: D] or HUM 106 [Min Grade: D]

HSAD 328 Health Care for Diverse Groups 3.0 Credits
Examines the administration of health services and special needs to different subpopulations classified according to gender, ethnicity, race, weight (the obese), and sexual orientation.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D] or ENGL 105 [Min Grade: D] or HUM 106 [Min Grade: D]

HSAD 329 Health Care and the Media 3.0 Credits
Much of the public's perception of issues in health care comes from the media (newspapers, magazines, television, film, advertising, the internet). The course explores the interactive relationship between health care and the media in presenting information to the public.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: A] or HUM 108 [Min Grade: D]

HSAD 330 Financial Management in Health Care 3.0 Credits
Emphasizes basic financial management theory related to the health-care industry, as well as accounting practices for health-care organizations.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ACCT 115 [Min Grade: D] or ACCT 110 [Min Grade: D]

HSAD 331 [WI] Non-profits and Health Care 3.0 Credits
Provides an overview of the not-for-profit and advocacy sector of health care, explores business fundamentals and current models, selects a health topic, assesses the market, and assists students in developing their own not-for-profit and/or advocacy business.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: (HSAD 310 [Min Grade: C] and HSAD 332 [Min Grade: C])

HSAD 332 [WI] Health-Care Marketing 3.0 Credits
Provides a comprehensive review of marketing's role in the health-care field by examining the history of health-care marketing, the contributions of marketing to the strategic objectives of health-care organizations, and the effects of marketing on public relations and the consumer.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HSAD 310 [Min Grade: C]

HSAD 333 Health, Illness, and the Arts 3.0 Credits
This course provides the opportunity to examine topics relevant to health and illness as depicted in the arts - primarily literature, film, and painting as well as other arts forms where appropriate.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D] and ENGL 102 [Min Grade: D] and ENGL 103 [Min Grade: D]

HSAD 334 Management of Health Services 3.0 Credits
In this course, students will learn forms and uses of traditional management functions - plan, direct, monitor, evaluate - as well as contemporary functions that are used in an array of health care services organizations. Students match skills and competencies within the respective domains of health services management.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HSAD 310 [Min Grade: C]

HSAD 335 [WI] Health-Care Policy 3.0 Credits
This course provides an introduction to the development and implications of U.S. health-care policy, including key governmental and non-governmental participants and the political process.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HSAD 310 [Min Grade: C] and PSCI 110 [Min Grade: D]

HSAD 336 Urban Health Care 3.0 Credits
Using an ecological model to analyze the special needs and issues in urban health care, students will examine the people, place, and politics of an urban area to assess the delivery and quality of health care and will complete an analysis of a real and current urban health-care-delivery problem, including solutions.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HSAD 337 Health Care/Quality Improvement 3.0 Credits
Quality Improvement (QI) is a critical component of the health-care-delivery system in the United States. Because errors and reliability issues have major implications, standards and measures are imperative to ensure consistency and safety. As such, this course examines existing programs in place and best-industry practices.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HSAD 338 Human Services & Health Systems 3.0 Credits
This course introduces existing health-care systems in the United States and globally in terms of the human services that support and are supported by those systems and the effect of human services on those systems and vice versa.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HSAD 339 Health Care Legislation 3.0 Credits
This course will examine the major roles played by local, state, and federal governments in the funding, delivery, oversight, and evaluation of health-care services. The rationale, history, and current examples of how localities protect the public health are given.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HSAD 340 Leadership in Health Services Administration 3.0 Credits
This course discusses issues in management and leadership in a health-care-administration setting by focusing on alternative organizational structures and the managerial role in these structures, as well as exploring managerial and leadership roles in specific health organizations and project management.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HSAD 310 [Min Grade: C] and HSAD 334 [Min Grade: C]

HSAD 341 Risk Management in Healthcare Organizations 3.0 Credits
This course is an introduction to risk management in health care. It describes the roles of a risk manager and the risks associated with various health care settings. Regulatory, contractual and medical malpractice exposures are discussed and techniques for controlling and preventing loss are evaluated. Students prepare a risk management plan for a healthcare organization.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HSAD 342 Children and Health Care 3.0 Credits
This course will focus on a range of issue facing the health-services industry in providing care to children with the goal of better understanding and meeting the special needs and challenges from both a direct care and systematic point of view.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HSAD 343 Health and Illness in Film 3.0 Credits
This course analyzes various films with themes and stories related to health and illness in view of conceptual theories on health and illness and conceptual elements of film as a representational medium.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D] and ENGL 102 [Min Grade: D]

HSAD 344 The Individual and Health Care Politics 3.0 Credits
Health-care policy can easily become questions of statistics and spreadsheets that obscure their origins in individual experience. Drawing upon a series of personal essays published in the journal Health Affairs and collected into the volume Narrative Matters, this course will discuss the power of first-hand experience in shaping health-care discourse.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: D]

HSAD 345 Ethics in Health Care Management 3.0 Credits
This course focuses on one aspect of the role of health care management professionals: the ethical dimension. The course combines an understanding of ethical theory with the practical application of ethical principles to management issues that arise in the health care arena. Discussions will be guided by cases drawn from real work experiences.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: HSAD 210 [Min Grade: C] or PHIL 321 [Min Grade: C]

HSAD 346 Mental Illness in the Media and Arts 3.0 Credits
The mentally ill and those who treat them are continually concerned about the portrayals of mental illness in the media and arts. Its often sensationalized and stigmatized image places an extra societal burden on the mentally ill and can lead to attempts to hide their illness rather than seek treatment. This course examines mental illness's social constructs, their sources, and effects.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HSAD 351 Ethical Issues in Reproduction 3.0 Credits
This course discusses ethical issues concerning human reproduction. The issues span contraception, abortion, assisted reproductive technologies, parenthood, and balancing fetal and maternal interests. Focus is placed on the variety of perspectives on these issues and underlying values.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: HSAD 210 [Min Grade: C] or PHIL 321 [Min Grade: C]

HSAD 352 Ethics in Health Care Research 3.0 Credits
This course is designed to familiarize students with some of the ethical issues involved in health-care research. These issues include, but are not limited to, responsible authorship, use of human subjects, use of animals, defining and handling scientific misconduct, confidentiality, and conflicts of interest.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: HSAD 210 [Min Grade: C] or PHIL 321 [Min Grade: C]

HSAD 353 Public Health Ethics 3.0 Credits
This course will address ethical issues in public health. Students will be exposed to a variety of views on topics including, but not limited to, human rights, the balancing of individual rights with public interests, managing disasters, epidemics, risky behaviors, and the meaning of health from a population standpoint.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: HSAD 210 [Min Grade: C] or PHIL 321 [Min Grade: C]

HSAD 357 Health Information Systems 3.0 Credits
This is an introductory course into Health Information Systems. The course will cover a wide range of healthcare information technology topics including management, governance, regulatory compliance and how to align with information technology. There is a growing trend and need for healthcare providers to align their practices with information technology in order to achieve the common goal of quality patient care while ensuring government and regulatory mandates are met. At the end of the course, students will be able to understand and apply the concepts discussed in class within their respective work places. We will relate the course materials to active cases to bring real life experience into the classroom. This course will focus on the partnership between technology and healthcare.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: C] or ENGL 113 [Min Grade: C]

HSAD 363 Health Care Privacy & Security 3.0 Credits
This is an introductory course in the privacy and security of health information in health care organizations. The course covers a wide range of healthcare Privacy & Security topics including Privacy and Security policies and procedures, regulatory requirements, Security Audit controls, selection of Security Framework and others. At the end of the course, students will be able to understand and apply the concepts such as security and privacy discussed in class within healthcare organizations. We will relate the course materials to active cases to bring real life experience into the classroom.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: C] or ENGL 113 [Min Grade: C]

HSAD 470 Readings in Health-Services Administration 1.0-6.0 Credit
This course is designed to allow juniors and seniors majoring in health-services administration and carrying minimum cum GPAs of 3.0 to pursue specialized interests in specific topics in health-services administration on an independent basis, yet under the direction of program faculty members. Faculty permission is required. May be repeated twice for credit.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 2 times for 12 credits
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: A] or HUM 108 [Min Grade: D]

HSAD 475 The Supervised Health Services Administration Internship 3.0 Credits
The Supervised Health Services Administration Internship course is a guided, tuition-based internship program. Students serve as on-site or remote interns for a health care or non-profit organization in the Philadelphia area over the course of a 10-week period. Students receive direction and experience working on a 'real world' task or projects from an assigned organization preceptor, while they are supported as needed by an HSAD program faculty member serving as their Internship Advisor.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: (ENGL 101 [Min Grade: C] or ENGL 111 [Min Grade: C] or ENGL 102 [Min Grade: C] or ENGL 112 [Min Grade: C] or ENGL 103 [Min Grade: C] or ENGL 113 [Min Grade: C]) and HSAD 310 [Min Grade: B] and HSAD 334 [Min Grade: B] and HSAD 340 [Min Grade: B]

HSAD 490 Senior Research Project 3.0 Credits
Designed for the senior in health-services administration, the student, in conjunction with a faculty member, selects a topic for a term project integrating knowledge acquired in the curriculum. The student develops objectives relevant to the project, critiques the literature, presents a plan for implementation, and completes the project.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: A] or HUM 108 [Min Grade: D]

HSAD I199 Independent Study in Health Services Administration 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

HSAD I299 Independent Study in Health Services Administration 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

HSAD I399 Independent Study in Health Services Administration 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

HSAD I499 Independent Study in Health Services Administration 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

HSAD T180 Special Topics in Health Services Administration 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

HSAD T280 Special Topics in Health Services Administration 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

HSAD T380 Special Topics in Health Services Administration 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

HSAD T480 Special Topics in Health Services Administration 3.0 Credits
This course covers topics of particular interest to students majoring in health-services administration. In different terms, a variety of topics are presented to the students. May be repeated for credit.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: A] or ENGL 108 [Min Grade: D]

Hebrew

Courses

HBRW 101 Introduction to Hebrew I 4.0 Credits
The goal of this course is to provide a thorough foundation in the Hebrew language. Small class size provides intensive practice in speaking, writing and listening comprehension.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HBRW 102 Introduction to Hebrew II 4.0 Credits
The goal of this course is to provide a thorough foundation in the Hebrew language. Small class size provides intensive practice in speaking, writing and listening comprehension. Continues HBRW 101.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: HBRW 101 [Min Grade: D]

HBRW 103 Introduction to Hebrew III 4.0 Credits
The goal of this course is to provide a thorough foundation in the Hebrew language. Small class size provides intensive practice in speaking, writing and listening comprehension. Continues HBRW 102.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: HBRW 102 [Min Grade: D]

HBRW 201 Hebrew IV 4.0 Credits
This course includes listening, speaking, reading, and writing practice, with a focus on cultural competency and conversational skills. Builds on HBRW 103.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: HBRW 103 [Min Grade: C]

HBRW 202 Hebrew V 4.0 Credits
This course includes listening, speaking, reading, and writing practice, with a focus on cultural competency and conversational skills. Builds on HBRW 201.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: HBRW 201 [Min Grade: C]

HBRW 310 Advanced Writing and Speaking 4.0 Credits
Provides advanced practice in written and oral communication, including journalistic, professional, and creative writing. Examines contemporary cultural contexts through media and news. Taught in Hebrew.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: HBRW 202 [Min Grade: C]

HBRW 410 Advanced Grammar and Translation 3.0 Credits
Provides advanced grammar instruction and fosters translation and communication skills within a contemporary cultural context. Taught in Hebrew.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: HBRW 310 [Min Grade: C]

HBRW I199 Independent Study in HBRW 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

HBRW I299 Independent Study in HBRW 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

HBRW I399 Independent Study in HBRW 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

HBRW I499 Independent Study in HBRW 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

HBRW T180 Special Topics in Hebrew 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

HBRW T280 Special Topics in Hebrew 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

HBRW T380 Special Topics in Hebrew 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

HBRW T480 Special Topics in HBRW 0.0-12.0 Credits
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

History

Courses

HIST 100 American History 4.0 Credits
This course provides an introduction to the history and geography of America. We will use historical images, films, and texts to examine a few important events in American history. This will provide you with insight into the culture and politics of the modern United States and its place in the world. This course is open only to students for whom English is a second language. The course will be taught in a manner appropriate to students still learning English.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Freshman or Sophomore . Cannot enroll if major is HIST

HIST 101 Introductory Seminar in History I 4.0 Credits
This course introduces freshmen history majors to the study and practice of historical inquiry. The course offers an overview of major themes related to historical practice: methodology, ethics, and professional development. It also introduces students to the history program, inviting them to meet and interact with the faculty of the department and their work.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is HIST.

HIST 102 Introductory Seminar in History II 4.0 Credits
This course introduces freshmen history majors to the study and practice of historical inquiry. Introductory Seminar in History II works specifically on historical research and writing skills development; students will learn key debates and concerns in historical methodology and engage in close reading of primary and secondary sources.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is HIST.

HIST 118 History of Modern Biology 4.0 Credits
In this course we will survey the history of biology in the modern period, from 1700-the present. We will explore how different sciences formed around the concept of life and methods for studying it. Examples will include systematics and classification, the impact of geology and paleontology, natural history and biogeography, embryology, evolution, physiology, microbiology, ecology, eugenics and genetics, molecular biology, astrobiology, and genomics. We will study these disciplines and related individuals, institutions, and theories in their social and cultural contexts to understand why they occurred in the places they did with the impact they had.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 125 The History of Drexel University 1.0 Credit
This course provides an overview and analysis of the history of Drexel University, founded in 1891 as the Drexel Institute of Art, Science, and Industry by banker and philanthropist Anthony J. Drexel. By the 1920s Drexel had evolved into a professional engineering school with a co-operative education program. By the 1950s, Drexel was a powerhouse as a local provider of technical talent—and it became Drexel University in 1970. As the local economy went through a brutal deindustrial transformation Drexel had to change or face bankruptcy. The 1990s saw Drexel recovering and by the beginning of the new century Drexel evolved again in a period of change marked by the acquisition and founding of medical, nursing, public health schools, and law schools.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 161 Themes in World Civilization I 4.0 Credits
We examine development of civilizations from antiquity to the 12th century and view patterns of historical change through key themes and interpretive debates, including political structures, land tenure and social systems, commercial and trade relations, the development of cities, science, and technology, and religions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 162 Themes in World Civilization II 4.0 Credits
Provides an analysis of civilizations from the 12th century to 1815 viewed through key themes and interpretive debates, including the development of the nation-state, interaction between civilizations, the concept of cultural unity, religious upheaval, disease and science, the relationship between culture and politics, and the nature of revolutions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 163 Themes in World Civilization III 4.0 Credits
Explores the emergence of modern civilization through key themes and interpretive debates, including industrialization, imperialism, science and technology, ideological debate, the nature of modern warfare, the relationship between nationalism and the state, and the emergence of state-sponsored racism.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 181 Religion, Science, and Medicine in History 4.0 Credits
In this course, key episodes in the historical interactions among religion, science, and medicine from the ancient world to the near-present will be examined. The primary focus is on Western science and medicine in the context of the three main monotheistic faiths of the Mediterranean (Christianity, Judaism, and Islam), but students in the course have the opportunity to examine other contexts as well.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 201 United States History to 1815 4.0 Credits
Examines the political, economic, and social forces that shaped America in the era of its founding.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 202 United States History, 1815-1900 4.0 Credits
Examines the emergence of modern America to the close of the Spanish-American War.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 203 United States History since 1900 4.0 Credits
Examines America as economic giant, world political power, and scene of social change.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 206 Race and Islam in Africa and the Middle East 4.0 Credits
This course explores the historical connections between Africa and the Middle East both as concepts, geographic expressions, homelands and sites of diaspora. This course will examine the changing definitions and connections between Africa and the Middle East from the ancient world until the present.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 208 Women in American History 4.0 Credits
Covers the history of American women from the 1890s to the present, with emphasis on women's rights, women and technology, women's role in war, and women in the labor force in the 20th century.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 212 Themes in African-American History 4.0 Credits
Explores the major issues in the development of African-American history through the 19th century, beginning with an overview of West and Central African societies in the 15th and 16th centuries and including the family, religion, forms of resistance, aesthetics, and patterns of white-black relationships.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 214 United States Civil Rights Movement 4.0 Credits
Examines the origins, objectives, successes and failures of the Civil Rights movement in the United States between 1954 and 1972.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 215 American Slavery 4.0 Credits
This course is a rigorous examination of slavery and its representation in the United States. Using primary and secondary resources, art, literature and film clips, the course explores the relationship between history and memory and the impact of the social, political, and gendered imagination.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 216 Freedom in America 4.0 Credits
This course examines African-American history, 1865 to the present, including the impact of gender and sexuality in history. The course compares primary and secondary sources to critique how history itself is manufactured and to investigate the role that sexuality and gender play in that process.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 218 Race and Film in United States History 4.0 Credits
This course examines the interplay between history, film, and African Americans' pursuit of social justice and equality. We study films as cultural artifacts or prisms through which to understand the dynamics of race and racial inscription in America.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 222 History of Work & Workers in America 4.0 Credits
Examines the changing nature of work and the lives of American workers, from the origins of wage labor in the 19th century to the transformations of the workplace in the 20th and 21st centuries.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 230 United States Military History I (before 1900) 4.0 Credits
Covers the origins and development of military institutions, traditions, and practices in the United States from the Revolution to the Spanish-American War, and the operational, intellectual, diplomatic, and social aspects of military history.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 231 US Military History II (since 1900) 4.0 Credits
Examines the emergence of the United States as a major military power, including military/civil relationships and the impact of technological change; the course covers World War I, World War II, Korean War, and Vietnam War.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 234 The United States Civil War 4.0 Credits
Examines the causes, course, and results of the American Civil War.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 235 The Great War, 1914-1918 4.0 Credits
Examines the global causes, conduct, and consequences of World War I, which fundamentally altered the next century's political, social, economic, and cultural institutions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 236 World War II 4.0 Credits
Provides an in-depth study of World War II, with emphasis on Europe but also including the war in North Africa, Asia, and the Pacific. Discusses major military events in a broad political framework, with lectures on economic, social, and scientific developments.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 239 The Pacific War 4.0 Credits
This course focuses on the conflict between China, Japan, the United States, the United Kingdom, and other countries from 1937 to 1945. We will also examine 1) the roots of the war in nineteenth-century changes in the distribution of power in the Pacific and 2) how the war redistributed power and alliances once again, contributing to the rise of the Cold War.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 245 England to Elizabeth, to 1558 4.0 Credits
A survey of the formation of the English people and their growth to national independence and maturity.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 246 England from Elizabeth to Waterloo, 1558-1815 4.0 Credits
Covers the crisis of the English constitution, the beginnings of modern society and the Industrial Revolution, and the formation of the British Empire.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 247 Modern England, 1815 - present 4.0 Credits
Examines Victorian England as the first industrial society, the course of empire through two world wars, and the challenge of the present.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 249 Modern Jewish History 4.0 Credits
Explores the social, cultural, political and religious forces that have shaped world Jewry from the 18th to the 20th centuries.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 250 European Revolutionary Movements and Ideology, 1815-1914 4.0 Credits
Provides a comprehensive analysis of the development and influence of the principal revolutionary movements and ideologies that challenged the European status quo from 1815 to 1914.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 251 Fascism 4.0 Credits
Provides a chronological/topical study of fascist movements and regimes in Europe between 1919 and 1945, with emphasis on Italian Fascism and German Nazism.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 253 Jewish Life and Culture in the Middle Ages 4.0 Credits
This course is an introductory survey of the history of the Jewish people, their civilization, religion, and contacts with other cultures in medieval times. Topics will include the rise of Christianity and Islam, the Talmud, Jewish mysticism, and the growth of Ashkenazic and Sephardic Jewry.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 254 Russian History Before 1900 4.0 Credits
Survey of Russian history from its origins to the end of the Tsarist period. This course covers both Russia's role in Western European history, and its interactions with Eastern Eurasian civilizations.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 255 Twentieth Century Russia & the USSR 4.0 Credits
Examines the last years of imperial Russia, showing the background to the revolutions of 1917, followed by a study of the institutions and personalities of the USSR.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 256 Germany & the World of Hitler 4.0 Credits
The course explores Germany's history from 1914 to 1945 through the historical figure of Hitler. This most notorious character will take students from gas warfare in the trenches of the First World War to the radical right wing circles of Munich; from Weimar culture to the Nazi seizure of power in 1933; from mass party rallies to the network of German highways; from the invasion of Poland to the occupation of the Soviet Union; from Auschwitz to Berlin ravaged by bombs and hunger. While placing Hitler in the wider context of European contemporary history students will enquire about the importance of individual figures in general historical dynamics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 257 The Reformation Age 4.0 Credits
The course covers the general background to the Reformation, both religious and secular, the growth of reform movements, including the big names (Luther and Calvin) but also other sects, the Catholic reform and counter-Reformation efforts, and the legacies of reform and the Reformation in Europe and beyond.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 258 History of Europe in the 19th Century 4.0 Credits
Analysis of the forces and events that define European civilization in the 19th century, from the Congress of Vienna to the origins of WWI.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 259 History of Europe in the 20th Century 4.0 Credits
Analysis of the forces and events that define European civilization in the 20th century, from the outbreak of WWI to the present.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 260 Coexistence and Conflict: Jews, Christians, and Muslims in the Early Mediterranean 4.0 Credits
This course investigates the history of interactions among the early Mediterranean's three major monotheistic religious communities: Jews, Christians, and Muslims. The course explores how religious communities understood themselves and each other as well as how and why multi-faith communities sometimes coexisted peacefully, sometimes coexisted tensely, and sometimes exploded into violence.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 261 Making of Modern South Asia 4.0 Credits
This introductory course is designed to familiarize students with the critical aspects of the colonial encounter and the transformation of power and authority in a vast region that has become modern-day India, Pakistan, Sri Lanka, Nepal and Bangladesh.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 263 The World and China 4.0 Credits
Examines China from its origins to the present day, with emphasis on social, political, and economic institutions. Describes the influences Chinese civilization has had on other societies of the world and the influences other societies have had on China.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 264 East Asia in Modern Times 4.0 Credits
Deals primarily with China and Japan, including a description of their traditional societies and the changes they have undergone during the 20th century.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 267 Twentieth Century World I 4.0 Credits
Examines movements, institutions, and personalities in the major regions of the world, from 1890 through 1939.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 268 Twentieth Century World II 4.0 Credits
Studies events in the major regions of the world since 1945 in historical perspective.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 270 [WI] Introduction to Latin American History 4.0 Credits
Takes a thematic approach to Latin American history, examining modernization and tradition, sex roles and family honor, love and lust, dictatorship and human rights abuses, poverty and crime, terrorism and revolutionary violence. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 271 History of Mexico 4.0 Credits
Surveys themes in Mexican history from the ancient civilizations of the Mayans and Aztecs to the present, including Spanish conquest, Hapsburg and Bourbon colonial systems, independence wars, social conflict and political protest, the Reform, Maximilian's empire, economic expansion, the revolution of 1910, and revolutionary Mexico.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 275 History of Pennsylvania 3.0 Credits
This course introduces students to the history and culture of the Commonwealth of Pennsylvania. Major topics include: the geography of Pennsylvania, Native-American culture before the Colonial Era, the Colonial Era and the governance of the Penn family, the development of the state's economy throughout the 18th, 19th, and 20th centuries, the role of urban centers such as Philadelphia and Pittsburgh, and the role of immigration and diversity in the history of the state.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 276 The History of Philadelphia 4.0 Credits
This course surveys the history of Philadelphia through pre-colonial, colonial, and industrial eras to the present day. Philadelphia is investigated as an economic, social, cultural, and political center. Students read primary and secondary sources and conduct original research into Philadelphia's history. Lectures and discussions are complemented by on-site historical investigations.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 278 Medicine Before Germs 4.0 Credits
This course focuses on the history of Western medicine before the acceptance of the germ theory of disease dramatically transformed medicine around the turn of the twentieth century. This course explores medical theories and practices, medicine's connections to the broader social and cultural context, and the lived experiences of patients and practitioners through sources written by those individuals as well as modern historians.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 279 History of Modern Medicine 4.0 Credits
This course will survey the intellectual, and social-cultural history of Western laboratory-based medicine from the late-19th century to the present. It will focus on the political, economic, institutional, and cultural aspects of the development of scientific medicine. Interpretive materials will include biographies, medical publications, films, and fictional accounts related to topics including the role of physicians, nurses, hospitals, biomedical research, therapies etc.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 283 Technology and Identity 4.0 Credits
In this course, we'll use the lens of identities--historical and contemporary experiences of race, class, gender, LGBTQ identities, physical and mental "ability/disability" divisions, age, and many other taxonomies of personhood--to understand science, technology, medicine, public health, and other bodies of knowledge.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 285 Technology in Historical Perspective 4.0 Credits
Examines the causal interrelations between technological developments and economic, social, intellectual, and political aspects of Western civilization from the 18th century to the present.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 287 History of Science: Ancient to Medieval 4.0 Credits
Explores the history of Western science from the Ancient to Medieval period. Surveys the intellectual content of natural philosophy (science) especially Babylonian, Greek, Roman sciences and medicine, in broader political, economic, social, and cultural context.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 288 History of Science: Medieval to Enlightenment 4.0 Credits
Explores the history of Western science (broadly understood) from the end of the Middle Ages to the Enlightenment. Connects the changes in the content, methodology, and meaning of natural knowledge to the broader political, economic, social, cultural, and intellectual trends of the time.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 289 History of Science: Enlightenment to Modernity 4.0 Credits
Explores the history of science in the modern period from Newton to late 20th century. Surveys the major developments in the history of science, including Newtonianism, chemical revolution, Darwinian evolution, laboratory revolution, modern genetics, ecology, and environmentalism in broader historical context.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 290 Technology and the World Community 4.0 Credits
Examines the effect on international relations of rapid technological change in the modern era and technology as a tool of modernization, political integration, and national security among advanced and developing states.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 291 Global History of Engineering 4.0 Credits
The course examines the development of the profession of engineering since the 18th century by focusing on the different approaches to engineering and engineering professionalism in several countries and empires from across the world, paying attention to their distinctive technological styles, ideologies, and roles in industrialization and state building.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 292 Technology in American Life 4.0 Credits
Examines the role of technology as means of production, social force, and ideology in modern U.S. history.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 293 Global Legal History 4.0 Credits
This course will explore the global history of law that shaped the empires from Medieval times to the contemporary world order. It will offer students a background to the central concepts of modern legal theory and introduce them to the wide array of dispute resolution that human beings have practiced within and beyond the normative legal spaces.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 296 Research Methods in History I 4.0 Credits
Designed for history majors in their sophomore year, this course introduces students to the fundamentals of historical research. The course focuses on methods, particularly in teaching students to locate and analyze evidence.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is HIST.
Prerequisites: HIST 102 [Min Grade: D]

HIST 301 The Study of History 4.0 Credits
This course is for history majors in their pre-junior or junior year; it explores conventions and historiographical conversations in the discipline of history. Students will examine philosophies of history, great historical debates, and the nature of historical evidence.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is HIST.
Cannot enroll if classification is Freshman
Prerequisites: HIST 296 [Min Grade: D]

HIST 302 The Study of Science, Technology, and Environment in History 4.0 Credits
This course offers an introduction to historiographies of science, technology and the environment (STE), investigating which questions and methodologies about STE have dominated historical scholarship. We'll explore issues of identity, geopolitics, and cultures by following historians' changing understandings of the patterns of knowledge production, dissemination, uptake, and resistance across STE. This course provides an introduction to the critical historiographies in the "science, technology, and environment" concentration within the history B.A.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 303 The Study of Global History 4.0 Credits
This course explores modern global history from the 17th to 21st century, familiarizing students with theories of global history (Annales School, world systems theory) while insisting on bottom up approaches. Taking a transnational perspective, students will follow things, ideas, and people on the move and delve into the spaces enabling such moves (ports, slave markets, caravans, cafes, technological infrastructures, scientific institutions). This course provides an introduction to the critical historiographies in the "global history" concentration within the history B.A.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 315 History of Capitalism 4.0 Credits
This course covers capitalism since 1500, taking a broad view of the development of this economic system in historical context. A complex set of cultural, political, and economic factors shaped capitalism over time and place, and students will consider variations and the explanations for its development. Among other things, the course will include a discussion of trade, firms, politics, and finance.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 316 History of American Business 4.0 Credits
This course explores the history of American business, broadly defined, including the evolving structure of business enterprise, business/government relations, business in an international context, and business and American culture since 1800.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 320 Disaster in Global History 4.0 Credits
This course engages students in critical debates and methods of analysis in the history of science, technology, and the environment through the consideration of disasters across geographical and historical boundaries.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 321 Themes in Global Environmental History 4.0 Credits
This course covers global history of the environment, with a special emphasis on environmental factors in urban, political, economic, and social development and change. Faculty may tailor the course to fit specific themes of expertise and interest. Themes may focus more specifically on particular time periods or sub-questions (migration, demography, politics and mass movements) but the approach will also be a transnational/global analysis.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 322 Empire and Environment 4.0 Credits
This course will deal with how colonial rule altered the environment including agrarian societies, rivers, forests, cities, human-animal and human-insect relations in India through the nineteenth and twentieth century. Students will learn about the colonial improvement missions of producing the tropical landscapes, productive agriculture, irrigation canals, dammed rivers and the creation of new environmental subjects in the empire.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 323 The History of Climate Change 4.0 Credits
In this course, we will explore how both natural and anthropogenic climate change eras have shaped human history, from the transformation of species to the current geopolitics of the oil regimes. By taking critical moments in the history of climate-human interaction, this course will explore the history of scientific ideas and practices, from the 18th century to the present, that serve as the foundation for modern conceptions of the weather and climate as a global system. Our aim is to put current scientific debates on climate change into historical and critical perspective as we seek to understand the ways climate has been interpreted and understood over time, both within and outside the scientific community.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 331 The American Revolution 4.0 Credits
The course examines the secession of the British colonies from the empire, including the causes of secession, conflicts among the colonists, the Revolutionary War, international relations during the war, and how the war transformed the colonies and their peoples.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 333 U.S.-Mexican War 4.0 Credits
The war between the United States and the Mexico Republic was one of the most important moments in the national history of each country. Using scholarship that explores the war from both sides of the border, this course encourages students to think critically about historical evidence, particularly as it reflects different ethical and cultural perspectives.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 334 American Empire in the Nineteenth Century 4.0 Credits
In this course, students study American territorial acquisition and settlement during the nineteenth century from the Louisiana Purchase to the Philippine-American War. Students will draw on perspectives from a variety of approaches to history, including cultural, political, and social history.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 338 The Vietnam War 4.0 Credits
The course focuses on the Second Indochina War between the United States and North Vietnam but also includes the origins of the Vietnam War in French imperialism, World War II, the Cold War, and the First Indochina War. Students also look at the consequences of the war for Vietnam, America, and the Cold War.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 340 History of Bodies in Science, Technology, and Medicine 4.0 Credits
We consider bodies as "vessels" of human experience and a category for historical study, exploring what human bodies meant to different cultures in different eras. In examining the ways in which science, technology, and medicine have investigated, depicted and intervened in human bodies in the late-modern era (since about 1700), this class tries to shed a bright light on culture more broadly: on modern ideas of human difference and commonalities, of mortality and morbidity, normalcy and deviance, pleasure and pain, ability and disability.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 341 Disabilities in History 4.0 Credits
This class considers histories of so-called abled and disabled bodies and the cultural persistence of that binary. It includes examples from many eras and global settings, and it touches on what have conventionally been categorized as both physical and intellectual disabilities. We will consider how historical landscapes, economies, technologies, sciences, arts, skills, and ideas of prestige and stigma all reflect shifting beliefs about ability and disability.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 355 Venice and the Mediterranean from the Middle Ages to Napoleon 4.0 Credits
Venice was one of the most important states in the Mediterranean for centuries during the Middle Ages and Early Modern periods of European history. It occupied a key place (both physically and metaphorically) between West and East, between Europe and the Byzantine and later Ottoman empires. Venice provides a vantage point from which to observe the history of the broader Mediterranean region.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 358 Witches, Demons, and Witch-hunters in European History 4.0 Credits
This course explores the history of magic, witchcraft, and demonology in Europe and its colonies from antiquity through the late 1700s. Main topics include the origins of European ideas and practices related to the supernatural; how those ideas and practices changed through Middle Ages and Renaissance; why large-scale witch-hunts emerged in early modern European societies; and why such hunts eventually faded out. We also consider questions of historical methods: How should scholars approach the problem of understanding the history of magic, witchcraft, and demonology? What sources can we use? How should we interpret those sources?.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 365 Science and State Power: Colonialism 4.0 Credits
This course will introduce students to the history of how science was practiced in colonial India and its relation to state power. Students will learn how developments in natural and social sciences were related to civilizing mission, how bodies became sites of governance in the colony, and the lasting legacy of scientific research in the postcolonial atomic state of India.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 366 The Black Atlantic: Slave Societies of the Americas 4.0 Credits
Between the sixteenth and nineteenth centuries, over twelve million Africans crossed the Atlantic in chains. Those who survived, and millions more of their descendants, were bought and sold as commodities and forced to labor under conditions of bondage in places as varied as Brazil, the Caribbean, and North America. Their diverse experiences of exploitation, struggle, perseverance, and liberation lie at the core of the foundation, and entrenchment, of the colonial order in the Americas. This course introduces students to scholarship on the history of the slave societies of the colonial Americas. It will trace how African and Afro-descendant people's varied experiences of slavery and freedom between the sixteenth and nineteenth centuries forged an interconnected and diverse Black Atlantic world.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 370 Conquest of Mexico 4.0 Credits
Students will analyze interpretations of "the conquest" and compare the roles of technology and culture. They will also examine carefully the variety of primary courses (including the letters written by Cortes, recollections by other conquistadors, and records of the Aztecs) that historians have used to support their contrasting conclusions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 380 Advanced History Seminar 0.5-12.0 Credits
An advanced special topics course. May be repeated for credit. History majors are required to take at least one HIST 380.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 10 times for 132 credits

HIST 385 Transnational History of Science, Technology and Environment 4.0 Credits
Drawing on methods from environmental history, history of science, and history of technology, this course explores historical connections around the globe. Focusing on concrete things that form part of the material culture of modernity, such as plants, commodities, infrastructure, diseases, energy resources, or climate, we examine climate, imperialism, and global governance structures, among other things.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HIST 396 Research Methods in History II 4.0 Credits
Building on skills from HIST 296, this course for history majors will focus on advanced research skills more tightly aligned with the senior seminar capstone project and introduce students to ethnographic, oral history, and quantitative methods. This second history methods course, taken at the junior level, also expands the majors' familiarity with questions of critical historiography.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is HIST.
Cannot enroll if classification is Freshman
Prerequisites: HIST 301 [Min Grade: D]

HIST 490 [WI] Senior Seminar I 4.0 Credits
In this senior capstone course, students conduct original research and produce an in-depth research project supervised by a historian. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is HIST and classification is Senior.
Prerequisites: HIST 301 [Min Grade: D] and HIST 396 [Min Grade: D]

HIST 491 [WI] Senior Seminar II 4.0 Credits
Requires completion of the project begun in HIST 490. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is HIST and classification is Senior.
Prerequisites: HIST 490 [Min Grade: D]

HIST I199 Independent Study in HIST 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

HIST I299 Independent Study in HIST 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

HIST I399 Independent Study in HIST 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

HIST I499 Independent Study in HIST 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

HIST T180 Special Topics in History 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

HIST T280 Special Topics in History 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

HIST T380 Special Topics in History 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

HIST T480 Special Topics in History 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Honors Program

Courses

HNRS 200 Introduction to Honors Program 0-1 Credits
Offers intensive discussion of a subject of significant intellectual interest. Subjects vary from section to section and are meant to engage entering Honors students with one another under the guidance of Drexel's best faculty. Different sections may be taken for credit.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

HNRS 201 Colloquium I 3.0 Credits
Explores some of the tensions between individualism and community. Recently offered topic: Exploring the State of Humanity: Assessing Contradictory Evidence, Weighing Intriguing Options.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

HNRS 202 Sophomore Colloquium II 3.0 Credits
Explores the interdependencies among these humanly constructed institutions. Recently offered topics: Implications of the Internet; Experts and Expertise.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

HNRS 301 Colloquium II 3.0 Credits
Explores the relationship of representation to reality in literature, film, other arts, philosophy, the media, science, or some combination of these. Recently offered topics: Creative Writing Workshop; Game Theory; Representations of the Holocaust.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

HNRS 302 Honors Colloquium 0.0-3.0 Credits
Provides comparative explorations of the intellectual and expressive products of diverse cultures. Focuses on one or more of the following cultural productions: literature, the arts, religion, philosophy, architecture, and politics.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

HNRS 303 Honors Colloquium 3.0 Credits
An interdisciplinary honors colloquium drawing upon literature, literary theory, and other cultural studies including the writings of scientists and engineers. Students will explore relations among science, technology and literature from the eighteenth to the twentieth centuries by reading primary critical texts produced during this period.
College/Department: Pennoni Honors College
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

HNRS 304 Honors Colloquium 3.0 Credits
This course is organized around the idea that, in order for a human society or a social system to exist, certain features of the environment or environ-mental system must be maintained. The preservation and maintenance of these features requires us to regulate or restrict some of our social uses of these systems.
College/Department: Pennoni Honors College
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

HNRS 305 Honors Colloquium 3.0 Credits
Students will participate in an archaeology dig in the Philadelphia area. Details will depend on digs active at the time, but the course may include historical documentation, survey, excavation techniques and process, preservation of artifacts, cleaning, cataloging, recording, record-keeping documentation, reporting interpretation, restoration and reconstruction, as appropriate to the work on the site.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

HNRS 306 Honors Colloquium 3.0 Credits
Students will engage in an intensive study of the literary and artistic manifestations of the "Gothic". To that end, the class will read some of the major texts associated with the form from the second half of the eighteenth century to its appearance in the twentieth century literature and film. In support of the major texts critical secondary essays will also be read.
College/Department: Pennoni Honors College
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

HNRS 307 Honors Colloquium 3.0 Credits
Students will examine the context and meaning of "popular" as a product of the mass society and its technologies. They will examine and develop the ideas of the post-structural society and the socioeconomic impact of music, the organizing and communicative power of music in everyday life, and the role music plays in socio emotional development.
College/Department: Pennoni Honors College
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

HNRS 450 Honors Directed Study 0.0-12.0 Credits
Provides independent study for honors students.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit

HNRS 499 Honors Senior Thesis 0.5-12.0 Credits
Available to students whose major does not include a senior research project.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

HNRS I199 Independent Study in HNRS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit

HNRS I299 Independent Study in HNRS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit

HNRS I399 Independent Study in HNRS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit

HNRS I499 Independent Study in HNRS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit

HNRS T180 Special Topics in HNRS 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit

HNRS T280 Special Topics in HNRS 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit

HNRS T380 Special Topics in HNRS 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit

HNRS T480 Special Topics in HNRS 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated 20 times for 60 credits

Hotel & Restaurant Management

Courses

HRM 110 Introduction to the Hospitality Industry 3.0 Credits
This course focuses on the diverse segments of the hospitality industry: hotel, event planning, travel and tourism, restaurants, and the casino industry. Topics include an overview of the field, the careers in the industry, and current issues and topics.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CULA or major is HOSP or major is HRM.

HRM 120 Principles of Food-Service Management 3.0 Credits
Examines the food and beverage industry from a managerial perspective focusing on labor and cost control, menu planning, and managerial issues. This course is an in-depth real world focus on current food service and its relation to other segments of the hospitality industry.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HRM 110 [Min Grade: D]

HRM 125 Hotel Operations Management 3.0 Credits
This course studies front-office management and control, including pricing, occupancy rates, audits, reservations, revenue management and other special functions. Interaction between the rooms division and other divisions within the hotel setting will be discussed. Customer service and guest needs will be emphasized.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HRM 130 Introduction to Tourism 3.0 Credits
The course reviews the basic concepts and techniques in the field of tourism and tourism management. It is an introduction to the tourism industry, cost and benefits of tourism, effects on the host communities, impacts on travelers and host communities, and promotion of tourism.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HRM 131 Tourism Geography 3.0 Credits
Students will become conversant in global geography and acquainted with significant world-class tourism destinations around the globe, with an emphasis on the top five world tourism destination countries of France, Italy, Spain, the United States and China.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HRM 130 [Min Grade: D]

HRM 150 Food & Beverage Customer Service 3.0 Credits
This course focuses on customer service within the food and beverage aspects of the hospitality industry, how service relates to the customer's needs, how to create this transference, and how the fundamental aspects are applied in the setting of the professional dining room.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CAS or major is CLSC or major is CULA or major is HOSP and classification is Freshman.

HRM 155 Hotel Customer Service 3.0 Credits
This course will examine the role that customer service plays in dictating a hotel employee's performance in order to exceed guest expectations. Student will explore certification areas that relate to hospitality and gain hands-on exposure through a series of field studies, reflections, and role playing scenarios.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HRM 110 [Min Grade: D]

HRM 160 Laws of the Hospitality Industry 3.0 Credits
Examines legal subjects relative to the foodservice and lodging industries including government regulations and foodservice operators, foodservice contracts, liability, patron civil rights, franchising, and bankruptcy and reorganization. Includes analysis of case studies and relevant court decisions.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HRM 165 Introduction to the Events Industry 3.0 Credits
This course is designed to provide students with an introduction to the all of the facets within the event planning industry. The purpose of the course is to gain experience in planning, orchestrating, budgeting, and managing events. Students will review and utilize the following: core vocabulary, best practices and principles, proposals and event specification sheets, destination and venue choice. Students will apply these principles for the Philly Chef Conference.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HRM 190 Industry Hours I 1.0 Credit
This course provides students an opportunity to gain professional networking experience in the hospitality industry. Students will participate in industry events, pursue professional society memberships, do volunteer hours, and conduct informational interviews with professionals in the industry.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HRM 215 Commercial Food Production 4.0 Credits
A practical based examination of back of the house food service practices. This course focuses on quantity and quality production of food for restaurant and event services, managerial elements of running a kitchen, and daily food service operations.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CULA 115 [Min Grade: D] or CULA 120 [Min Grade: D]

HRM 220 Purchasing for the Hospitality Industry 3.0 Credits
Covers principles and techniques of quantity-foods purchasing and hospitality furnishings. Emphasizes channels of distribution, determination of specifications, mechanics of buying, and the purchasing function in food-service facilities.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: HRM 110 [Min Grade: D] or HRM 120 [Min Grade: D]

HRM 225 Equipment Design and Layout 3.0 Credits
Covers principles of selection, operation, and maintenance of food-service equipment. Emphasizes requirements for various hospitality facilities and the supporting design, construction, and renovation of such.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: HRM 120 [Min Grade: D]

HRM 250 Contract Foodservice Management 3.0 Credits
Introduces students to the dynamics of a commercial foodservice operation.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: HRM 120 [Min Grade: D]

HRM 290 Industry Hours II 1.0 Credit
This course provides students an opportunity to gain professional networking experience in the hospitality industry. Students will participate in industry events, pursue professional society memberships, do volunteer hours, and conduct informational interviews with professionals in the industry.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HRM 305 Food Blogging 3.0 Credits
A practical introduction to writing for the online space using multi-media skills, creative independence, and social media. This class also includes ethical discussions that are particular to the ever-changing digital landscape.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

HRM 310 Hospitality Accounting Systems 3.0 Credits
Studies accounting systems for hotels, restaurants, and institutions, including analysis of business transaction flow and the preparation and interpretation of financial statements. Includes consideration of the Uniform System of Accounts for Restaurants, computer-assisted processing, reports generation, and data analysis.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: HRM 110 [Min Grade: D]

HRM 315 Continental, Ethnic, and Regional Cuisine 3.0 Credits
The course explores the origins of what we now call Mediterranean Cuisine (in its widest definition) from the fall of the Roman Empire in the 6th century to the Age of Reason in the 17th and through to its contemporary definition. We visit Asia, the sub continent, the Maghreb, Middle East and other Mediterranean destinations defining their historic, cultural and contemporary contributions and cooking a wide variety of indigenous dishes. This is the most influential of all cultures on contemporary western cooking and diet.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CULA 115 [Min Grade: D] or CULA 120 [Min Grade: D]

HRM 320 Hospitality Management Information Systems 3.0 Credits
Studies computer applications in the hospitality industry, including inventory control, restaurant systems, bar and beverage systems, and telephone and security-management systems. Emphasizes guest tracking, electronic cash registers, and point-of-sale devices.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore
Prerequisites: HRM 110 [Min Grade: D]

HRM 330 Hospitality Marketing and Branding 3.0 Credits
This course explores marketing and public relations industry concepts and applications unique to the various segments of the hospitality industry. The course focuses on basic marketing and public relations principles and services, advertising and sales in conjunction with the information needs of hospitality managers.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: HRM 120 [Min Grade: D] or HRM 110 [Min Grade: D]

HRM 335 Beverage Management 3.0 Credits
Provides a comprehensive study of wines, spirits, and beers and the role they play in the success of the hospitality industry. Covers topics including history, marketing and sales, channels of distribution, manufacturing processes, mixology, and service and control systems, with concentration in American and European wines and international beers. Gears application to computerized and accounting system. tips certification.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HRM 120 [Min Grade: D]

HRM 340 Catering Management 3.0 Credits
Examines techniques of catering management and their application in the professional food-service environment, with emphasis on menu planning, controls, and budget preparation.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: HRM 120 [Min Grade: D]

HRM 345 Convention Management 3.0 Credits
Provides an in-depth study of convention, corporate, and group segments of the hospitality industry.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: HRM 110 [Min Grade: D]

HRM 347 Sport Tourism 3.0 Credits
Students will investigate international sport tourism organizations and their services, and analyze issues including: Sport tourism facility and event financing, sport tourism impacts, and globalization and sport tourism.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: HRM 130 [Min Grade: D]

HRM 350 Cost Controls in Hospitality 3.0 Credits
Course deals with theory and technique basic to managing costs and maximizing profits in relevant area within restaurant, hotel, and tourism segments of hospitality.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HRM 110 [Min Grade: D] or HRM 120 [Min Grade: D]

HRM 355 Resort Management 3.0 Credits
This course studies the unique aspects of managing a full service destination resort in contrast to a traditional hotel operation. Students will study varied aspects of resort management including guest profiles, resort operations, report marketing and program development among other topics.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HRM 125 [Min Grade: D]

HRM 360 Hospitality Industry Public Relations 3.0 Credits
This course provides students with an understanding of the process and effective use of public relations as applied to the hospitality industry with a focus on restaurants. A variety of marketing communication media including advertising, sales promotions, and development of a press kit and press releases will be examined. During the course students will develop a public relations campaign for a specific restaurant.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HRM 110 [Min Grade: D]

HRM 365 Heritage Tourism 3.0 Credits
Using the historic city of Philadelphia and its main background, this course reviews the significance and role of culture and heritage related tourist attractions. Students deal with the main issues in current research on heritage tourism while having hands-on exposure to the managements and marketing of some of Philadelphia's landmarks.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HRM 130 [Min Grade: D]

HRM 370 Gaming and Casino Management I 3.0 Credits
Examines theories pertinent to casino games including the organizational management, staffing, regulations, internal control, and reporting requirements of gaming operations.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HRM 110 [Min Grade: D]

HRM 371 Gaming and Casino Management II 3.0 Credits
This course studies advanced casino management topics such as game statistics, casino marketing and profitability. Students will study the probability and mathematics of casino games and review in depth casino marketing concepts and techniques that are unique to gaming. Race and sports book operations will also be studied.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HRM 370 [Min Grade: D]

HRM 375 Security and Loss Prevention 3.0 Credits
This course studies the unique aspects of managing security in the hospitality industry. Students will study various aspects of security and loss prevention including security equipment, guest concerns, departmental responsibilities, protection of fund, emergency management, risk management and insurance. This course will include a site visit and guest lectures.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HRM 370 [Min Grade: D]

HRM 385 Tourism Guest Lecture Series 3.0 Credits
This course provides contact with prominent industry professionals who visit class weekly to convey their experiences and facilitate discussions.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HRM 390 Industry Hours III 1.0 Credit
This course provides students an opportunity to gain professional networking experience in the hospitality industry. Students will participate in industry events, pursue professional society memberships, do volunteer hours, and conduct informational interviews with professionals in the industry.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HRM 395 Economics of Tourism 3.0 Credits
This course introduces participants to economic and government policy issues that impact the tourism industry. The course provides a strategic framework for understanding the macroeconomic and policy environment that is shaped by multilateral institutions, government and the tourism industry.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HRM 399 Hospitality Practicum Experience 3.0 Credits
This course provides students an opportunity to gain additional short-term professional experience in the hospitality industry. Students secure their own position relevant to their area of interest and will work with a faculty member to reflect on their experiences. This guided, supported reflection will allow students to identify their strengths and weaknesses and to take steps to address concerns.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HRM 415 Fine Dining and Services 4.0 Credits
This advanced-level course requires students to design, produce, and market a weekly dinner to the public. With the participation of guest chefs from some of the area's finest hotels and restaurants, students produce food comparable to that served in the finest restaurants in the city.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HRM 215 [Min Grade: D]

HRM 425 Hospitality Industry Administration 3.0 Credits
This course provides students the opportunity to conduct an in-depth study of various managerial strategies with a hospitality executive. The course will examine the application of the tools of strategic management in hospitality settings and introduce models, methods, and techniques which can be used to identify strategic issues and generate future-oriented action plans to inform tactics that are designed to implement change.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CULA or major is HOSP or major is HRM and classification is Junior or Senior.
Prerequisites: HRM 355 [Min Grade: D]

HRM 435 Wine Regions of the World 3.0 Credits
Provides a detailed study of the classification, production, identification, and service of alcoholic beverages, with a major emphasis on wines. Uses a systematic approach to tasting and evaluation. Must be 21 years old prior to the first day of the term.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.

HRM 436 Spirits and Mixology 3.0 Credits
The course will focus on the fundamentals of preparing and serving classic and craft cocktails. Students will explore the history, processes and uses of major spirits. Emphasis will be on the foundations of creating a bar program, costing out recipes, and proper service guidelines.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HRM 437 Fundamentals of Beer 3.0 Credits
This course is focused on the world's most important beverage from a historical, financial, and cultural perspective. Students will get a hands-on approach to beer tasting and the production of beer.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HRM 450 Hospitality Leadership Seminar 3.0 Credits
This course integrates material covered in multiple disciplines related to the hospitality industry. Examines the development of innovative management in all segments of the industry. Identification and development of a personal leadership philosophy and style.
College/Department: Center for Food Hospitality Management
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CULA or major is HOSP or major is HRM and classification is Senior.

HRM 455 Hospitality Human Resources Management 3.0 Credits
This course examines the specific function of human resources in the hospitality industry by examining careers in hospitality and through real-world practical application. Topics examined include the importance of recruitment and selection, training, compensation programs, and performance management in all segments of the hospitality industry.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CULA or major is HOSP or major is HRM and classification is Junior or Senior.

HRM 470 Gaming Legislation, Policy and Law 3.0 Credits
This course provides an overview of federal and state laws governing legalized gaming in the United States with emphasis on gaming in Pennsylvania. The powers of the state regulatory agencies will be examined with discussion concerning the underlying reasons used in regulating to ensure the integrity of the gaming industry.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HRM 370 [Min Grade: D]

HRM 472 Gaming Information Systems 3.0 Credits
This course studies computer information systems that are unique to the Gaming Industry. Students will study each system from a business perspective learning function and process. They will perform case studies, view produce demonstration and observe new technology trends that impact casino operations.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HRM 371 [Min Grade: D]

HRM 475 Current Issues in Gaming 3.0 Credits
Current issues in the management of casino and gaming operations. Environmental trends, planning and development, policy formulation, social and economic impact and marketing of casinos and gaming operations are potential topics for discussion.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: HRM 371 [Min Grade: D]

HRM 490 Industry Hours IV 1.0 Credit
This course provides students an opportunity to gain professional networking experience in the hospitality industry. Students will participate in industry events, pursue professional society memberships, do volunteer hours, and conduct informational interviews with professionals in the industry.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HRM 495 Industry Hours V 1.0 Credit
This course provides students an opportunity to gain professional networking experience in the hospitality industry. Students will participate in industry events, pursue professional society memberships, do volunteer hours, and conduct informational interviews with professionals in the industry.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

HRM I199 Independent Study in HRM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

HRM I299 Independent Study in HRM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

HRM I399 Independent Study in HRM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if major is CULA or major is HOSP or major is HRM.
Cannot enroll if classification is Freshman or Pre-Junior or Sophomore

HRM I499 Independent Study in HRM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

HRM T180 Special topics in HRM 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

HRM T280 Special topics in HRM 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

HRM T380 Special topics in HRM 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

HRM T480 Special topics in HRM 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

Human Resource Management

Courses

HRMT 321 Staffing in Organizations 4.0 Credits
This course provides an overview of the process by which managers make decisions about staffing. It is intended to be useful for line managers and for persons who seek professional careers in HR. The focus is on theories, research, policies, and practices concerning selection for effective utilization of human resources.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: HRMT 323 [Min Grade: D]

HRMT 323 Principles of Human Resource Administration 4.0 Credits
Covers the underlying principles of personnel administration used in organizations by personnel departments and often by line managers. Uses case studies and exercises to illustrate the practical implications of various principles.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ORGB 300 [Min Grade: D]

HRMT 345 Seminar In Human Resource Management 4.0 Credits
Presents an integrated approach to human resource management. Examines a wide range of human resource issues faced by employers and employees in contemporary society.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ORGB 300 [Min Grade: D] and HRMT 323 [Min Grade: D] and HRMT 321 [Min Grade: D]

HRMT I199 Independent Study in HRMT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

HRMT I299 Independent Study in HRMT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

HRMT I399 Independent Study in HRMT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

HRMT I499 Independent Study in HRMT 1.0-4.0 Credit
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if classification is Junior or Senior.

HRMT T180 Special Topics in HRMT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

HRMT T280 Special Topics in HRMT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

HRMT T380 Special Topics in HRMT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

HRMT T480 Special Topics in HRMT 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

Humanities, General

Courses

HUM 006 Oral Communication Skills for Non-Native Speakers 0.0 Credits
Designed to help international members of the Drexel community improve their listening comprehension and oral communication skills in English. Provides participants with opportunities to make presentations and receive constructive feedback, with particular attention to grammar, pronunciation, and fluency problems. Especially recommended for international teaching assistants.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

HUM 107 Humanities and Communications II 0.0-3.0 Credits
Covers the research process. Continues work with critical analysis begun in hum 106. Requires students to apply research methodology as they write a critical review and a chemistry synthesis paper, and develop group proposals for their design projects. Also requires students to continue the study of literature begun in hum 106 and continue keeping journals.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HUM 108 Humanities and Communications III 0.0-3.0 Credits
Requires students to write a literary analysis of a play in production locally and discuss visual arts. Includes written and oral presentations of students' final engineering design projects. Coordinates readings in non-fiction with the course science component. Requires students to write a synthesis paper for biology and continue using journals as a means for reflection.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

HUM 315 Perspectives in Medical Humanities 3.0 Credits
This course introduces a multidisciplinary approach to health related topics rooted in literary, philosophical, social, scientific/technological, and psychological perspectives and methodologies. Discussion format and student participation in choosing readings enhance a sense of community among the participants.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is CMDH.
Cannot enroll if classification is Freshman

Industrial Engineering

Courses

INDE 240 Technology Economics 3.0 Credits
Techniques for project decisions: benefit cost, present worth and annual worth analysis, rate of return, minimum attractive rate of return, capital budgeting, risk analysis, and depreciation.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

INDE 300 Quality Management 3.0 Credits
This is a course about managing quality. It will introduce quality concepts necessary for an organization to remain competitive in today's economy. Discussion will focus on the tools and techniques necessary to manage quality processes within an organization.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: MATH 122 [Min Grade: D]

INDE 301 Health Systems Introduction 3.0 Credits
Emphasis on the application of industrial engineering methodologies to analyze and solve health systems challenges. Critical evaluation of the utility of key industrial engineering concepts and tools for assessing and modeling health care problems and challenges in health care delivery.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.

INDE 331 Lean Manufacturing 3.0 Credits
This course introduces the fundamental Lean Manufacturing principles that underlay modern continuous improvement approaches for industry, government and other organizations. The course will provide the student with an introduction to lean manufacturing describing the background behind its development and how evaluations and assessments of production systems are performed. Lean production tools and techniques such as flow, just- in-time, poka-yoke, inventory turns, standardized work, pull system, value streams, quick changeover, workplace organization, and visual controls will be described and in some cases demonstrated in simulation exercises.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

INDE 340 Introduction to Decision Analysis 3.0 Credits
Overview of modeling techniques and methods used in decision analysis, including multiattribute utility models, decision trees, and Bayesian models. Psychological components of decision making are discussed. Elicitation techniques for model building are emphasized. Practical applications through real world model building are described and conducted.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.
Prerequisites: STAT 262 [Min Grade: D] and MATH 122 [Min Grade: D]

INDE 350 Industrial Engineering Simulation 3.0 Credits
Covers techniques and application of computer simulation of existing or proposed real world systems and processes. Models of such systems or processes are often complex, precluding traditional analytical techniques. Students will build simulation models and do simulations with commercial simulation software, analyze and interpret the results, and to plan simulation studies.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: STAT 201 [Min Grade: D]

INDE 351 Intelligent Manufacturing Systems 3.0 Credits
Design and simulation of intelligent manufacturing systems with special emphasis on sensor-integrated robotic assembly tasks. Fundamentals of artificial intelligence, application of robotics, sensors, vision, network integration, and flexible assembly work cells. Industry based case studies and working examples.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

INDE 361 Quality Control 3.0 Credits
Covers theory and methods for design and analysis of quality control systems, including solutions to problems of product specifications, process control, acceptance inspection, and other means of quality assurance. Fall. Alternate years.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: STAT 261 [Min Grade: D]

INDE 362 Operations Research for Engineering I 3.0 Credits
Introduces systems sciences, including linear programming and other linear optimization methods, simplex method, primal-dual solution methods, the transportation method, pert-cpm and other network techniques, and dynamic programming. Requires development and presentation of simulation term-project proposals. Winter.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 261 [Min Grade: D]
Corequisite: MATH 261

INDE 363 Operations Research for Engineering II 3.0 Credits
Covers single and multi-episode probabilistic inventory models, queuing theory, single and multichannel systems, production scheduling and other assignment methods, Markov processes, Poisson processes and other stochastic systems, and replacement theory. Includes selected case studies. Applications: queuing, reliability, inventory, and finance. Requires development and presentation of term-project simulation models.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: INDE 362 [Min Grade: D]

INDE 365 Systems Analysis Methods I 3.0 Credits
Provides an introduction to the concepts and techniques used in analysis of complex systems. Covers the origins and structure of modern systems and the step-wise development of complex systems and the organizations of system development projects. Systems Development Lifecycle (SDLC) from concept development, engineering development, post-development.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

INDE 366 Systems Analysis Methods II 3.0 Credits
OO (Object Oriented) Methodology and UML (Universal Modeling Language) modeling, within the SDLC (System Development Life Cycle) framework, are covered in this class. There are two components to OO systems Analysis and Design; The ORM (Object- Relationship Model) is a way to describe or represent objects, classes of objects, relationships between objects and classes, and memberships of the real world. The OBM (Object-Behavior Model) is a means of describing the behavior of objects.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: INDE 365 [Min Grade: D]

INDE 367 Data Processing 3.0 Credits
Covers the information ?based skills necessary for Industrial Engineers. It is a project based course. Particular attention is paid to real world database problems. This course explains data acquisition and database systems. The course focuses on designing databases for given problems. Students will use different database techniques. Introduction to SQL.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

INDE 370 Industrial Project Management 3.0 Credits
Provides an overview of the roles, responsibilities, and management methods of technology in project management. Emphasizes scheduling of various projects, monitoring, control and learning from projects. Three interrelated objectives of budget, schedule, and specifications are also introduced. The course assumes no prior knowledge in management techniques and is intended to teach students how to develop approaches and styles of management for service and manufacturing industry projects.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

INDE 375 Quality Improvement by Experimental Design 4.0 Credits
Methods for Design and analyzing industrial experiments. Blocking; randomization; multiple regression; factorial and fractional experiments; response surface methodology; Taguchi's robust design; split plot experimentation.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: STAT 261 [Min Grade: D] or STAT 201 [Min Grade: D]

INDE 400 Designs of Program Evaluation Systems 3.0 Credits
Focus on evaluation broadly conceived to include evaluation of programs as well as within business organizations. The context of the class is evaluation in the health care sector, particularly long term care. Emphasis placed on the development of valid and practical models, and the identification and measurement of short-term and long-term intervention outcomes. Covers principles of research design, evaluation, and measurement issues.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: STAT 261 [Min Grade: D] or STAT 201 [Min Grade: D] or STAT 211 [Min Grade: D]

INDE 420 Industrial Energy Systems 3.0 Credits
The course enables students to understand the basics of energy supplies and uses, and how energy may be used more efficiently in industry. The course teaches students to use process integration methods and tools necessary for identifying and designing efficient industrial energy systems that contribute to sustainable development. The course addresses use of methods to identify the cost-optimal mix of different energy process technologies to satisfy a given process energy demand. Technical energy systems encountered in the course include electrical, thermal, and mechanical energy systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 202 [Min Grade: D] (Can be taken Concurrently)

INDE 461 Methods of Engineering and Measurement 3.0 Credits
Covers fundamentals for developing methods improvements and measurement of these improvements through time study and standard data. Includes analysis and design of man-and-machine work systems and application to typical problems in work measurements. Fall. Alternate years.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: POM 311 [Min Grade: D]

INDE 462 Industrial Plant Design 3.0 Credits
Covers design of a product-oriented facility, including process design, materials handling, work area design, storage and warehousing, and service-area planning. Includes complete final plant layout and presentation of term project. Winter. Alternate years.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: INDE 461 [Min Grade: D]

INDE 463 Production Management 3.0 Credits
Covers production planning and control systems, including materials, equipment, and manpower requirements; manufacturing planning and control, including production scheduling, inventory, and quality control; analytical methods for inventory control; and production planning and methods. Spring. Alternate years.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: INDE 462 [Min Grade: D]

INDE 467 Decision Processes 3.0 Credits
Covers advanced methods of analyzing decision-making under uncertainty, including expected value concepts and criteria, decision tree analysis, preference theory concepts, probabilistic risk assessment, risk analysis using simulation techniques, and decisions to purchase imperfect information. Uses case studies relating to facility siting, resource exploration and development, and new technology deployment and market penetration. Fall. Alternate years.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 261 [Min Grade: D]

INDE 468 Analysis of Experimental Data 3.0 Credits
Covers use of linear and non-linear models to identify cause and estimate effect. Includes randomization and blocking with paired comparisons, significance testing and confidence intervals, factorial designs, least squares regression analysis, response surface methods, analysis of variance, and Box-Jenkins and other time series forecasting methods. Fall.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 261 [Min Grade: D]

INDE 469 Organization Planning and Control 3.0 Credits
Analyzes human, capital, and physical resource planning, allocation, and control, including human factors and man-machine interface, technological innovation, concepts of behavioral science, and structure and dynamics of industrial organizations. Uses a case study approach to situational analysis. Spring. Alternate years.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: POM E311 [Min Grade: D] and POM 461 [Min Grade: D]

INDE 470 Engineering Quality Methods 3.0 Credits
Methods for controlling and improving industrial processes. Control charts; process capability; multifactor experiments; screening experiments; robust designs. Understanding of the continuous quality improvement tied to a real life project improvement.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

INDE 490 Senior Project Design 4.0 Credits
Design methodology and engineering principles applied to open-ended design problems with inherent breadth and innovation. This course integrates the knowledge acquired in the various courses of the undergraduate curriculum to an open-ended design effort and applies the knowledge gained to the solution of contemporary engineering problem. Requires written and oral final reports, including oral presentations by each design team at a formal design conference open to the public and conducted in the style of a professional conference. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: INDE 470 [Min Grade: D] (Can be taken Concurrently)

INDE I199 Independent Study in INDE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

INDE I299 Independent Study in INDE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

INDE I399 Independent Study in INDE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

INDE I499 Independent Study in INDE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

INDE T180 Special Topics in INDE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

INDE T280 Special Topics in INDE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

INDE T380 Special Topics in INDE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

INDE T480 Special Topics in INDE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

Information Science & Systems

Courses

INFO 101 Introduction to Computing and Security Technology 3.0 Credits
Explores the infrastructure that makes current information and communication technology possible. Introduces foundational concepts of servers, networks, databases, and the Web. Addresses security and usability considerations that cut across all computing technology. Approaches computing technology from the perspective of system administrators who plan, manage, operate, and monitor large scale computing infrastructure. Covers emerging technologies including pervasive computing, continuous integration, virtualization, and the Internet of things. Explores professional opportunities in this high demand area.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

INFO 102 Introduction to Information Systems 3.0 Credits
Introduces students to major types of information systems and their development and their use in organizations. Emphasizes ways in which information systems can be used to help individuals and organizations meet their goals. Assumes basic knowledge of computing concepts.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

INFO 103 Introduction to Data Science 3.0 Credits
A first course in data science. Introduces data science as a field, describes the roles and services that various members of the community play and the life cycle of data science projects. Provides an overview of common types of data, where they come from, and the challenges that practitioners face in the modern world of "Big Data." Provides an introduction to the interdisciplinary mixture of skills that the practice requires.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

INFO 105 Introduction to Informatics 3.0 Credits
Considers the field of informatics as the application of information and computer sciences to a specific domain. Focuses on the three components on informatics: information, users, and information and communication technologies. Topics include information needs, user groups, social media, technology evolution and diffusion of innovation.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

INFO 108 Foundations of Software 3.0 Credits
Provides students with fundamental concepts about software and software representation. Topics include software and database representation, development environments, and techniques for designing, coding, testing and deploying software systems. Introduces programming concepts and activities using pair programming activities.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

INFO 110 Introduction to Human-Computer Interaction 3.0 Credits
Introduces the field of human-computer interaction, with a broad scope that exposes students to a variety of approaches for conceptualizing, designing, and evaluating user interfaces and user experiences. Focuses on using design thinking to define problems and solutions, and developing skills for critiquing interactive systems. Topics include interaction design principles, user experience research, usability evaluation, and novel interaction paradigms.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

INFO 150 Introduction to Ubiquitous Computing 3.0 Credits
Introduces the field of ubiquitous computing, which refers to the modern era of computers embedded into everything we do, everywhere we are. From smartphones to smart homes, students will explore what makes an object or device "smart". Topics include privacy, interfaces, location, and context-awareness. Engages students of any background in reflecting on the role of ubiquitous computing in everyday life, and thinking critically about impacts of present and future technologies.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

INFO 151 Web Systems and Services I 3.0 Credits
Introduces technologies used to build leading-edge application systems and services on the World Wide Web. Coverage includes a selection of Web components such as mark-up and scripting languages, and server components of Web applications. Introduces Web programming using pair or small team programming activities.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

INFO 152 Web Systems and Services II 3.0 Credits
Explores techniques used to build leading-edge application systems on the World Wide Web. Topics include Web server components of Web applications, and basic database processing. Includes Web programming using pair or small team programming activities.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 151 [Min Grade: D] or CS 140 [Min Grade: D]

INFO 153 Applied Data Management 3.0 Credits
Explores technologies used to gather, organize, store, and retrieve data in various forms. Focuses on using databases and various file formats in software systems. Topics include file and database access, data munging and management, and data structures. Includes data management software development using pair or small team programming activities.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 152 [Min Grade: D]

INFO 154 Software System Construction 3.0 Credits
Introduces considerations that make large software systems challenging to design, build, and maintain. Topics include coding standards and documentation, program architecture, verification, software evolution, and managing large software systems. Includes software modification and development using pair and team programming.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 152 [Min Grade: D]

INFO 200 Systems Analysis I 3.0 Credits
Study of the principles, practices and tools of information systems analysis and design. Emphasis on learning pragmatic aspects of working as a systems analyst and employing the tools of systems analysis and design.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 101 [Min Grade: D]

INFO 202 Data Curation 3.0 Credits
This class explores the full range of data curation lifecycle activities, from the design of good data through metadata creation, ingest, data management, access, implementation, and reuse. It will help students develop a foundation in the curation of digital information (including data), and will enable students to understand the role and objectives of curation for organizations and projects that use data to analyze, share and provide access and re-use to collections of their digital information.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 103 [Min Grade: D]

INFO 203 Information Technology for Engineers 3.0 Credits
Provides an introduction to relational system analysis and design and computer networking for engineering students. Covers requirements gathering, development of data flow diagrams and entity-relationship diagrams, and fundamental protocols for TCP/IP networking and routing.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

INFO 210 Database Management Systems 3.0 Credits
Focuses on how to design databases for given problems, and how to use database systems effectively. Topics include database design techniques using the entity-relationship approach, techniques of translating the entity-relationship diagram into a relational schema, relational algebra, commercial query languages, and normalization techniques.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 101 [Min Grade: D] or SE 210 [Min Grade: D]

INFO 212 Data Science Programming I 3.0 Credits
Introduces the main tools and ideas in the data scientist's toolbox. Focuses writing interactive and programming code for extracting, cleansing, wrangling, transforming, reshaping, and analyzing data. Covers practical tools and ideas including Linux command line, version control, git, and interactive programming. Studies various Python packages for high performance data analysis.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 153 [Min Grade: D] or CS 172 [Min Grade: D]

INFO 213 Data Science Programming II 3.0 Credits
Discusses the latest analytic and predictive techniques to solve real world business problems. Focuses on practice rather than theory by using existing Python libraries and tools to produce solutions. Covers practical Python implementations of the basic concepts in mathematics and statistics that are at the core of data science. Introduces Python libraries for the most common models and techniques for data analytics such as clustering, classification, regression, and decision trees.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 212 [Min Grade: D] and STAT 201 [Min Grade: D]

INFO 215 Social Aspects of Information Systems 3.0 Credits
Introduces social issues involved in information systems design and use, e.g., personal computing, telecommuting, computers in education, the privacy and security of stored and transmitted information, and information ownership. Explores the interaction of high technology, employment, and class structure.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

INFO 250 Information Visualization 3.0 Credits
Introduces the foundation and the state of the art of information visualization. Explores and reflects on the design, application, and evaluation of a diverse range of information systems. Demonstrates how a number of common types of information can be visually, intuitively and interactively represented. Provides a first-hand experience of visualizing a variety of realistic data types.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit

INFO 300 Information Retrieval Systems 3.0 Credits
The theoretical underpinnings of information retrieval are covered to give the student a solid base for further work with retrieval systems. Emphasis is given to the process of textual information for machine indexing and retrieval. Aspects of information retrieval covered include document description, query formulation, retrieval algorithms, query matching, and system evaluation.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: (INFO 153 [Min Grade: D] or CS 172 [Min Grade: D]) and INFO 102 [Min Grade: D]

INFO 310 Human-Centered Design Process & Methods 3.0 Credits
Introduces the student to the process of human-centered design of interactive user interfaces. Teaches some of the basic approaches to design and evaluation of interactive user interfaces. Delivers practical advice on interaction design challenges. Applies human-centered design principles in the design of the user interface to an interactive computer system.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 110 [Min Grade: D] or INFO 151 [Min Grade: D] or CS 171 [Min Grade: D] or ECE 105 [Min Grade: D] or ECE 203 [Min Grade: D]

INFO 315 Advanced Database Management Systems 3.0 Credits
This course will cover advanced database systems and concepts necessary in understanding modern database technologies beyond INFO 210 (Database Management Systems). Major topics include database programming in PL/SQL, including stored procedures, functions, triggers and packages, business intelligence, data warehouses, OLAP, ETL, data lake, big data architectures, and principles & practices of NoSQL databases.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 210 [Min Grade: D]

INFO 323 Cloud Computing and Big Data 3.0 Credits
Provides overview and insights into technologies, opportunities, and challenges related to cloud computing and big data. Covers concepts of scalable data analysis, predictive modeling, and graph analysis through specific cloud computing platforms. Introduces the components and tools in cloud computing ecosystems associated with big data solutions as well as NoSQL databases. Through hands-on instructions and assignments, students will develop working knowledge of practical tools and strategies of processing massive data sets using the map/reduce framework.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 103 [Min Grade: D] and INFO 210 [Min Grade: D] and INFO 212 [Min Grade: D]

INFO 324 [WI] Team Process and Product 3.0 Credits
Provides hands-on experience with working in small teams to apply processes and produce products typical of current best practices in computing and information technology organizations. Allows students to develop an integrated understanding of project life cycle phases. Examines issues of team organization and operation, problem solving, and communication.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: (INFO 153 [Min Grade: D] or CS 172 [Min Grade: D]) and INFO 200 [Min Grade: D]

INFO 332 Exploratory Data Analytics 3.0 Credits
In this course students learn the essential exploratory techniques for summarizing and analyzing data. The course discusses how to install and configure software necessary for a statistical programming environment. It covers practical issues in statistical computing, which includes programming in R and how to use R for effective data analysis. The course covers the plotting systems in R and some of the basic principles of constructing data graphics.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 103 [Min Grade: D] and STAT 201 [Min Grade: D]

INFO 350 Visual Analytics 3.0 Credits
Introduces the aims, principles, and practical tools of visual analytics for analytic reasoning and decision making. Characterizes key issues concerning with uncertainty, incomplete and conflict information. Examines the role of interactive visual analytic reasoning processes. Provides opportunities to use advanced interactive visual analytic tools.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: INFO 250 [Min Grade: D] and INFO 212 [Min Grade: D]

INFO 355 Systems Analysis II 3.0 Credits
A project-oriented course that discusses software engineering and advanced techniques of requirements modeling, prototyping and software design, particularly utilizing object-oriented techniques. The course builds upon Systems Analysis I, requiring students to apply their knowledge of systems analysis tools and techniques.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 210 [Min Grade: D] and INFO 200 [Min Grade: D]

INFO 365 Database Administration I 3.0 Credits
Database Administration is a continuation of Database Management Systems, and includes the following: advanced ERD techniques, database management system internals and advanced elements of the SQL language, as well as stored procedures and triggers, specifically as demonstrated in the Oracle implementation.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 210 [Min Grade: D] and (CS 171 [Min Grade: D] or CS 175 [Min Grade: D] or INFO 152 [Min Grade: D] or SE 102 [Min Grade: D])

INFO 366 Database Administration II 3.0 Credits
Introduces the principles and practices of database administration, particularly as they apply to commercial-grade relational database management systems. The course will include, but not be limited to, installation, systems tuning, application tuning, security, user management, backup and recovery. To this end, internals of RDBMSs will be discussed, using major commercial RDBMSs as examples. Distributed database issues will also be discussed. As time permits, other advanced issues will be addressed, such as issues of object and object-relational databases.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 365 [Min Grade: D]

INFO 371 Data Mining Applications 3.0 Credits
Introduces students to basic data mining approaches using machine learning tools. Focuses on machine learning algorithms for information inference and knowledge discovery from data. Covers major applications in data/text/web processing, analysis and mining.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: STAT 201 [Min Grade: D]

INFO 375 Introduction to Information Systems Assurance 3.0 Credits
Introduction to the problem of security for modern information systems. Provides an overview of threats, both human and computer, to the security of an organization's data and information resources. Explores how systems may be made less vulnerable and how to respond. Examines issues of personal security in an electronic world.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 200 [Min Grade: D] and CT 140 [Min Grade: D]

INFO 405 Social and Collaborative Computing 3.0 Credits
This course provides an introduction to the ways that computing systems support social interaction and productive collaboration. Students will learn concepts from social science theory and research and use these concepts to analyze systems and imagine novel systems designs that meet the needs of groups and organizations. Students will spend time examining, using, and participating in social and collaborative computing environments such as collaboration tools, crowdwork platforms, social media, and various online communities.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 310 [Min Grade: D] or INFO 110 [Min Grade: D]

INFO 410 Information Technology Infrastructure 3.0 Credits
Presents methods for evaluating and selecting information technologies and planning technology implementation. Emphasizes consideration of needs and issues of the organization and individuals served by the technology. Also addresses issues in management of served by the technology. Also addresses issues in management of technology after initial installation including service planning, maintenance, and evolution.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

INFO 415 Information Technology Services 3.0 Credits
Introduces issues in management and delivery of IT services. Addresses needs and approaches to operational support including providing services, help desks, online support, documentation, and user training. Examines approached to defining, measuring, and analyzing service and support quality.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

INFO 420 Software Project Management 3.0 Credits
The objective of this course is to study project management in the context of software systems development. The course will cover the processes, contexts, metrics, planning and management concerns of managing projects for modern software systems.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: (INFO 200 [Min Grade: D] or SE 210 [Min Grade: D]) and (CS 172 [Min Grade: D] or CS 265 [Min Grade: D] or INFO 152 [Min Grade: D] or SE 103 [Min Grade: D] or CS 176 [Min Grade: D])

INFO 432 Advanced Data Analytics 3.0 Credits
Focuses on data analytic techniques that aim to understand data, discover knowledge, and learn from data. Presents the fundamentals of statistical inference and data analytic techniques in a practical approach. Provides methods on how to effectively collect data, analyze, understand data, and estimate some important quantities. Covers the key ideas in advanced functionality available in the R packages for conducting data analytics.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 332 [Min Grade: D] and INFO 371 [Min Grade: D]

INFO 440 Social Media Data Analysis 3.0 Credits
Explores data analytic methods for analyzing, understanding, and visualizing emerging trends on social media from social, organizational and cultural perspectives. Students will analyze various content materials and activities on social media to discern the relationship between online behavior and underlying social phenomena.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 212 [Min Grade: D] or CS 172 [Min Grade: D]

INFO 442 Data Science Projects 3.0 Credits
This course is a capstone course that provides an opportunity for students to apply a data science approach to solve domain problems. Students form a team and challenge a real-world project of their choices. Each team selects a domain and a data set, and then applies a data science approach to actual situations for real-world decision making. Each team is required to come up with a scientific question with a business value, perform an explorative data analysis, develop a data science model, evaluate the results, and communicate the results with audience.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: INFO 213 [Min Grade: D] and INFO 371 [Min Grade: D] and INFO 332 [Min Grade: D]

INFO I199 Independent Study in INFO 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

INFO I299 Independent Study in INFO 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

INFO I399 Independent Study 2.0-12.0 Credits
Requires approval of advisor, supervising faculty member and college. BSIS majors may take a maximum of 6 credits of independent study. Any exception to this maximum must be approved in advance by the student's advisor. Independent study on a topic selected by the student. Independent study is supervised by a faculty member and guided by a plan of study developed by the student in a term prior to the term in which the independent study is pursued.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

INFO I499 Independent Study in INFO 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

INFO T480 Special Topics in Information Systems 0.0-4.0 Credits
Selected topics of interest to students in information systems. May be repeated for credit if topic varies.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

Interactive Digital Media

Courses

IDM 100 Introduction to Web Development 3.0 Credits
This is an entry level course for non-interactive digital media majors that introduces students to the process of managing online content as well as how to define the presentation styles and interaction modes for the user through the use of a content management system.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

IDM 101 History of Web Development 3.0 Credits
This course explores all aspects of web development including the foundations of web technologies, formulation of web standards and how the individual web surfer's wants and needs have changed over time. Also discussed will be ground-breaking websites and the evolution of interface design for the web.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

IDM 211 User Interface Design I 3.0 Credits
This course covers the design, prototyping, and evaluation of graphical user interfaces by exploring topics like human capabilities, input technologies, heuristic evaluation, and design methods, principles and rules. We will learn how to design aesthetically pleasing user interfaces, covering important design principles (learnability, visibility, error prevention, efficiency, and visual design) and the human capabilities that motivate them (including perception, motor skills, color vision, attention, and human error).
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

IDM 212 User Interface Design II 3.0 Credits
This course builds upon the topics covered in User Interface Design I by exploring advanced topics of graphical user interface design for desktop, mobile, and touch screen devices.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 211 [Min Grade: D]

IDM 213 Interaction Design 3.0 Credits
This course is a study of interaction design. You will explore principles, patterns and process for interaction design, define the structure and behavior of interactive systems and how these can be used to create meaningful relationships between people and the products and services that they use.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 212 [Min Grade: D]

IDM 215 User Experience Design I 3.0 Credits
In this course, students learn to identify and implement the elements required to create incredible digital experiences. Through the application of user-centered design practices, students will develop predictive and enjoyable designs based on a holistic consideration of users' experience. Topics covered in this course include brand personality, research strategies, content strategy, information architecture, and usability.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 213 [Min Grade: D] (Can be taken Concurrently)

IDM 216 User Experience Design II 3.0 Credits
This course focuses on taking prototypes from User Design I and creating fully functioning web apps. Students will create and execute a full production pipeline and learn to incorporate User Design practices along the way.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 215 [Min Grade: D]

IDM 221 Web Design I 3.0 Credits
This course is a comprehensive overview of the design, creation, delivery and maintenance of functional, standards-based content on the Internet. Students will learn the aesthetics of web design alongside the underlying markup languages. They will critically evaluate web design quality, learn how to create and maintain quality web sites, and learn about accessibility and web design standards, and why they are important.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 211 [Min Grade: D] (Can be taken Concurrently)

IDM 222 Web Design II 3.0 Credits
This course builds upon the topics covered in Web Authoring I by exploring advanced web development topics and current industry best practices.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 221 [Min Grade: D]

IDM 231 Scripting for Interactive Digital Media I 3.0 Credits
This course explores modern client-side scripting languages that interact with the user, control the browser, communicate asynchronously, and alter document content and functionality.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 221 [Min Grade: D]

IDM 232 Scripting for Interactive Digital Media II 3.0 Credits
This course explores modern server-side technologies for Internet based delivery of dynamic content that connect to and manipulate database content. Students learn how to build interactive, data-driven products.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 231 [Min Grade: D]

IDM 240 Interactive Graphics 3.0 Credits
In this course, students learn how to use modern development techniques to create responsive and scalable two-dimensional graphics with support for interactivity and dynamic animation. Topics include styling and transforming vector graphics, raster graphics, and text where the implementation takes future growth into consideration.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 222 [Min Grade: D] and (IDM 231 [Min Grade: D] or INFO 151 [Min Grade: D])

IDM 241 Microinteractions 3.0 Credits
In this course, students learn to identify and implement the elements required to create incredible digital experiences. Through the application of user-experience design practices, students will develop predictive and enjoyable interactive designs based on a holistic consideration of users' experience. Topics covered in this course include brand personality, content strategy, information architecture, and usability.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 213 [Min Grade: D] (Can be taken Concurrently)IDM 231 [Min Grade: D]

IDM 245 Web Game Design 3.0 Credits
Examines multimedia-authoring tools used to create interactive games. Students learn real world production techniques as they master advanced game design concepts.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 231 [Min Grade: D]

IDM 250 Content Management Systems 3.0 Credits
Students set up a content management system and develop a custom theme. Includes project planning, organizing and maintaining a quality code base.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 222 [Min Grade: D] and (IDM 232 [Min Grade: D] or INFO 152 [Min Grade: D])

IDM 311 User Interface Design for Immersive Media 3.0 Credits
This course explores the nature of user interface design when applied to immersive media hardware, including Virtual Reality and Augmented Reality headsets.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 213 [Min Grade: D] and IDM 231 [Min Grade: D]

IDM 331 WebVR 3.0 Credits
This course explores ways to deliver virtual reality experiences via a web browser.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 231 [Min Grade: D] and IDM 311 [Min Grade: D]

IDM 361 Interactive App Design I 3.0 Credits
Focuses on creating user experiences optimized for mobile devices. Students learn to build unique web applications that take advantage modern mobile capabilities. Special consideration is given to limited screen real estate, low bandwidth Internet access, no Internet access, and touch screen devices.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (IDM 213 [Min Grade: D] or IDM 215 [Min Grade: D]) and IDM 231 [Min Grade: D]

IDM 362 Interactive App Design II 3.0 Credits
This course builds upon the topics covered in Mobile Interactive Design I by exploring how to convert web-based applications into cross-platform native applications for mobile devices. Special consideration is given to incorporating functionality that is currently unavailable in web-based applications.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (IDM 232 [Min Grade: D] or INFO 152 [Min Grade: D]) and IDM 361 [Min Grade: D]

IDM 363 Interactive App Design III 3.0 Credits
This course explores ways to deliver and test native mobile application prototypes using IDE's (integrated Development Environments).
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 216 [Min Grade: D] and IDM 232 [Min Grade: D]

IDM 364 Interactive App Design IV 3.0 Credits
Learn how to build and test dynamic web application prototypes using event driven JavaScript languages.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 216 [Min Grade: D] and IDM 232 [Min Grade: D]

IDM 371 Interactive Digital Media Workshop I 3.0 Credits
This course explores the developing or redesigning a successful interactive digital experience. Students work in team environments to analyze project requirements, develop a strategy for development, and utilize their design skills to present their findings to the client.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 216 [Min Grade: D] and IDM 232 [Min Grade: D]

IDM 372 Interactive Digital Media Workshop II 3.0 Credits
This course builds upon the topics covered in Interactive Digital Media Workshop II by continuing to work in a team environment to building a high-fidelity interactive digital media prototype with a focus on usability testing.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 371 [Min Grade: D]

IDM 381 Experimental Interactive Technologies 3.0 Credits
This course focuses on researching new innovations in experimental digital media technologies.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 213 [Min Grade: D] and IDM 232 [Min Grade: D]

IDM 382 Internet of Things 3.0 Credits
This course uses an open approach to enable quick and seamless interactions with physical objects and locations via web protocols.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: WEST 107 [Min Grade: D] and IDM 232 [Min Grade: D]

IDM 399 Independent Project in Interactive Digital Media 0.5-6.0 Credits
Supervised planning and execution of a project in the area of Interactive Digital Media.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

IDM 401 Professional Practices in Interactive Digital Media 3.0 Credits
This course will provide a broad overview of the practices of all areas included in the fields related to interactive digital media, including: organizational structure and roles, client communication and creative process, needs assessment, brief writing, brainstorming, concept development, pitches, pricing, proposals and presentations.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 372 [Min Grade: D]

IDM 402 Validating Product Ideas 3.0 Credits
This course will teach you how to design, implement, and measure multichannel experiences with greater impact for customers, businesses, and society.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 215 [Min Grade: D]

IDM 417 User Research Methodologies 3.0 Credits
Understanding the user is the fundamental backbone of User Experience Design. This course will teach students how to construct, implement and analyze user interviews in a way that will allow them to gain deep insights into their target audience.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: IDM 215 [Min Grade: D]

IDM 418 Storytelling for User Experience Design 3.0 Credits
Students will learn how to use stories to understand the user, his/her goals and objectives, explain research, and describe design concepts.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

IDM I399 Independent Study in Interactive Digital Media 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

IDM T180 Special Topics in Interactive Digital Media 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

IDM T380 Special Topics in Interactive Digital Media 0.5-6.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Interior Design

Courses

INTR 160 Visualization I: Computer Imaging 3.0 Credits
An introductory course that explores the use of proprietary computer
applications for communications and the preparation of visual materials
in Interior Design. The course introduces and reinforces classic design
principles for expert visual communication of ideas through digital
techniques from an Interior Design perspective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

INTR 200 History of Modern Architecture and Interiors 3.0 Credits
Covers development of modern architecture and interiors in the 19th and
20th centuries. Develops a vocabulary for discussing architecture; an
understanding of how various factors affect design; and a familiarity with
names, movements, and buildings that are part of historical development.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

INTR 211 Textiles for Interiors 3.0 Credits
This course is a comprehensive introduction to textiles and their use in the
interior design profession.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

INTR 220 Visualization II: Orthographic 3.0 Credits
This course explores design communication skills through hand drawing
and model building exercises. Orthographic drawing skills are developed
through investigation of plan, section, elevation and three dimensional
drawings.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

INTR 225 Environmental Design Theory 3.0 Credits
This course introduces design students to the relationship between
people and the build environment. Understanding how people perceive,
interact with, and are affected by their surroundings through readings and
design exercieses make evident the significance of the psychological,
pyshicological, social and cultural concepts of environmental behavior as
an integral part of the designed environment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

INTR 231 Structure 4.0 Credits
Investigates structure as an organizing principle in design by man and
nature. Explores the basic objective and subjective relationships between
form and function. Includes professionally juried presentations.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 103 [Min Grade: C-] or VSST 106 [Min Grade: C-]

INTR 232 Interior Studio I 4.0 Credits
Primary spatial course. Involves conscious recognition of the
manipulability of space or spaces within a given volume and small-scale
environmental orientation. Includes professionally juried presentations.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: INTR 231 [Min Grade: C-]

INTR 233 Interior Studio II 4.0 Credits
Covers diagramming program requirements, designing for complex spatial
requirements with an awareness of building systems (e.g., partitions,
heating/ventilating/cooling, lighting), and furniture. Includes professionally
juried presentations.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: INTR 232 [Min Grade: C-]

INTR 241 Visualization III: Digital 3.0 Credits
An intensive introduction to two and three dimensional drawing and
visualization through the computer. This course explores orthographic
and perspective drawing conventions and techniques from a digital
perspective.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: INTR 231 [Min Grade: C-]

INTR 245 Visualization IV: 3D Modeling 3.0 Credits
An intensive introduction to advanced modeling and rendering software.
Students will explore lighting, materiality, advanced form and spatial
experience through realistic three-dimensional digital models.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: INTR 241 [Min Grade: D]

INTR 250 Interior Materials 3.0 Credits
Introduces basic construction materials and how they may be used
successfully by the interior designer. Includes sample materials, visual
aids, and guest speakers.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

INTR 300 [WI] Visual Culture: Interiors 3.0 Credits
Visual Culture: Interiors addresses the interior environment by studying
the role history, economics, culture, materials and technological
developments, impact decisions made by designers on interior spaces.
While comparing historical context with specific knowledge, this
course will enable the student to be a more articulate designer by a
comprehensive examination of the interiors. This is a writing intensive
course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

INTR 305 [WI] Visual Culture: Furniture 3.0 Credits
An overview of furniture in relationship to interiors, and its influences reaching from the roots of antiquity to the impact of technology in today's products. It is the study of artifacts from various time periods and cultures in relation to social and political developments, life and work styles, visual arts, and economic influences.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

INTR 310 Sustainability: History, Theory and Critic 3.0 Credits
Course examines the meaning and implications of sustainable design to develop an informed interpretation and working assessment of this movement. Concepts and methodologies are explored through assigned readings, class discussion, feild trips and team research.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

INTR 331 Residential Design Studio 4.0 Credits
Provides experience with extensive real space. Emphasizes recognizing its aesthetic quality and maximizing its potential to meet the requirements of the inhabitants, by stylistic quality and elaboration in the selection and application of furniture finishes and accessories. Includes professionally juried presentations.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

INTR 341 Visualization V: Methods 3.0 Credits
An advanced course in visualization for Interior Design. Hybrid representation strategies and specialized topics in digital and hand rendering will be covered.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

INTR 350 Interior Detailing 3.0 Credits
Covers basic considerations of interior construction and detailing and their application.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: INTR 250 [Min Grade: D] and INTR 233 [Min Grade: C-]

INTR 351 Interior Lighting 3.0 Credits
This course analyzes human needs and the perceptual responses of both general and special populations. It introduces the lighting design theory and principles and explores methods of creating mood and atmosphere with light. It develops vocabulary, documentation methods and understanding of energy conservation, lighting standards, and safety.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: INTR 350 [Min Grade: D]

INTR 410 Collaborative Research in Sustainability 3.0 Credits
This cumulative course is the advanced students' opportunity to participate in a collaborative, interdisciplinary team in which the students will be applying sustainable technical and conceptual education in the context of 3rd party competitions, internally defined design challenges or applied research.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: ARCH 320 [Min Grade: C-]

INTR 430 Commercial Design Studio 4.0 Credits
Covers design of institutional-commercial interiors, including space planning, selection of materials and furnishings toward a synthesized environment, and development of specifications. Includes professionally juried presentations.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: INTR 331 [Min Grade: C-]

INTR 441 Furniture Design 4.0 Credits
Covers design of environmental elements, simultaneous concerns with craftsmanship and the application of materials to ideas, and development of prototypes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 2 times for 13 credits
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: VSST 203 [Min Grade: D]

INTR 442 Hospitality Design Studio 4.0 Credits
Covers design of commercial hospitality interiors, including spatial layout, custom furnishings, lighting, selection of materials, and code requirements. Includes professionally juried presentations.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is INTR.
Prerequisites: INTR 430 [Min Grade: C-]

INTR 445 Contract Documentation for Interior Design 3.0 Credits
Provides an understanding of the basic procedures and techniques for the development of construction drawings and furniture documentation. Requires students to use case studies to produce a set of drawings representative of current interior design industry standards.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: INTR 245 [Min Grade: D] and INTR 430 [Min Grade: C-]

INTR 450 [WI] Professional Practice 3.0 Credits
Surveys contemporary business methods, practices, and procedures in the operation of a design firm, including legal and ethical implications. Examines these practices through case studies and lectures by design professionals. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: INTR 331 [Min Grade: C-]

INTR 451 Interior Systems 3.0 Credits
Introduces building systems, mechanical, electrical, ceiling and furniture systems, and their effect on the interior environment. Includes visual aids and guest speakers.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: INTR 350 [Min Grade: D]
Corequisite: INTR 430

INTR 470 Competition Studio 3.0 Credits
Competition opportunities from regional to international from professional to philanthropic allow for investigations of diverse contemporary issues surrounding the built environment. Students work under direction of a faculty member(s) to discuss, explore and develop solutions for entry into noteworthy competitions.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 1 times for 6 credits
Restrictions: Can enroll if classification is Junior or Senior.

INTR 491 Senior Project I 3.0 Credits
Part one of the 3-term senior project where students develop a capstone independent design project from concept, research and programming to complete design development.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is INTR.
Prerequisites: INTR 430 [Min Grade: C-]

INTR 492 Senior Project II 3.0 Credits
Part two of the 3-term senior project where students develop a capstone independent design project from concept, research and programming to complete design development.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is INTR.
Prerequisites: INTR 491 [Min Grade: C-]

INTR 493 Senior Project III 3.0 Credits
Part three of the 3-term senior project where students develop a capstone independent design project from concept, research and programming to complete design development.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is INTR.
Prerequisites: INTR 492 [Min Grade: C-]

INTR I199 Independent Study in Interior Design 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

INTR I299 Independent Study in Interior Design 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

INTR I399 Independent Study in Interior Design 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

INTR I499 Independent Study in Interior Design 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

INTR T180 Special Topics in Interior Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

INTR T280 Special Topics in Interior Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

INTR T380 Special Topics in Interior Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

INTR T480 Special Topics in Interior Design 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

International Business

Courses

INTB 200 International Business 4.0 Credits
This course examines economic, political, legal, and social factors affecting formulation of international business strategy.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

INTB 332 Multinational Corporations 4.0 Credits
Discusses the role and function of multinational corporations in the global economy, reasons for their existence, and the impact of market structures on the operations of multinationals. Considers the interactions between multinationals and national authorities, and the international transfer of technology.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECON 201 [Min Grade: C] and ECON 202 [Min Grade: C]

INTB 334 International Trade 4.0 Credits
Examines major issues in international trade and commercial policy. Uses real-world applications to derive and illustrate models of international trade. Covers rationales and benefits of international trade, protectionism, the political economy of commercial policy, international trade and development, and economic integration and world trade.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECON 201 [Min Grade: C] and ECON 202 [Min Grade: C]

INTB 336 International Money and Finance 4.0 Credits
Examines major issues in international finance and open-economy macroeconomics. Develops models of international monetary interdependence and applies them to real-world examples. Covers determinants of interest rates, balance of payments, international macro policy, restructuring the international monetary system, and globalization of financial markets.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ECON 201 [Min Grade: C] and ECON 202 [Min Grade: C]

INTB 338 Regional Studies in Economic Policies and International Business 4.0 Credits
Study of the industry,trade and macroeconomic trends of a major world region,such as East Asia, Latin America, Europe or the Near East.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: ECON 201 [Min Grade: C] and ECON 202 [Min Grade: C]

INTB 440 Seminar in International Business 4.0 Credits
Writing and discussion on advanced topics relevant to International Business. Content is determined mainly by the interests of the students enrolled at a particular term.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: INTB 200 [Min Grade: C]

INTB 482 International Business and Emerging Markets 1.0 Credit
The course is required for INTB students participating in the LeBow College of Business undergraduate international residency. It is structured as an independent study course with no lecures. A term research paper is a requirement.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

INTB I199 Independent Study in INTB 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

INTB I299 Independent Study in INTB 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

INTB I399 Independent Study in INTB 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

INTB I499 Independent Study in INTB 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

INTB T180 Special Topics in INTB 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

INTB T280 Special Topics in INTB 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

INTB T380 Special Topics in INTB 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

INTB T480 Special Topics in INTB 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

International Studies

Courses

IST 398 International Research Project and Study Abroad 0.5-20.0 Credits
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

Italian

Courses

ITAL 101 Italian I 4.0 Credits
Introductory Italian. Includes listening, speaking, reading, and writing. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ITAL 102 Italian II 4.0 Credits
Continues ITAL 101. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ITAL 101 [Min Grade: C]

ITAL 103 Italian III 4.0 Credits
Continues ITAL 102. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ITAL 102 [Min Grade: C]

ITAL 201 Italian IV 4.0 Credits
Intermediate Italian. Includes grammar review, listening, speaking, and reading. Recommended for students who wish to attain oral competence based on standard usage. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ITAL 103 [Min Grade: C]

ITAL 202 Italian V 4.0 Credits
Continues ITAL 201. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ITAL 201 [Min Grade: C]

ITAL 230 Italy and Italians Today 3.0 Credits
This course will cover contemporary Italy through a cultural lens. Taught in English in a seminar style, this course will draw upon faculty expertise from various departments and colleges within Drexel University, although there will be a faculty leader responsible for the class. This course is required for the minor in Italian Studies.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ITAL 310 Advanced Writing and Speaking 4.0 Credits
Provides advanced practice in written and oral communication, including journalistic, professional, and creative writing. Examines contemporary cultural contexts through media and news. Taught in Italian.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ITAL 202 [Min Grade: C]

ITAL 320 Introduction to Language for the Professions 3.0 Credits
Introduction to communication skills in areas such as contemporary business, health, and law in a culturally sensitive fashion. Taught in Italian.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: ITAL 310 [Min Grade: C]

ITAL 330 Topics in Identities and Communities 3.0 Credits
Introduction to the analysis of individual and collective identities, including issues of gender, sexual orientation, race, ethnicity, class, nationality, and religion. Taught in Italian. Topics will vary according to the instructor's expertise.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: ITAL 310 [Min Grade: C]

ITAL 410 Advanced Grammar and Translation 3.0 Credits
Provides advanced grammar instruction and fosters translation and communication skills within a contemporary cultural context. Taught in Italian.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: ITAL 310 [Min Grade: C]

ITAL 420 Advanced Topics in Language for the Professions 3.0 Credits
Advanced communication skills in areas such as contemporary business, health, and law in a culturally sensitive fashion. Taught in Italian. Topics will vary according to the instructor's expertise.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: ITAL 310 [Min Grade: C]

ITAL 430 Advanced Topics in Identities and Communities 3.0 Credits
Advanced analysis of individual and collective identities, including issues of gender, sexual orientation, race, ethnicity, class, nationality, and religion. Taught in Italian. Topics will vary according to the instructor's expertise.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: ITAL 310 [Min Grade: C]

ITAL 480 Italian Minor Thesis Course 0.5-4.0 Credits
Independent research study on a topic selected by the student. Independent study is supervised by a faculty member and guided by a plan of study. At the end of the course, the student is required to produce a paper and oral defense on the topic of his paper.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

ITAL I199 Independent Study in ITAL 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ITAL I299 Independent Study in ITAL 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ITAL I399 Independent Study in ITAL 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ITAL I499 Independent Study in ITAL 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ITAL T180 Special Topics in Italian 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ITAL T280 Special Topics in ITAL 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ITAL T380 Special Topics in Italian 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

ITAL T480 Special Topics in Italian 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 96 credits

Japanese

Courses

JAPN 101 Japanese I 4.0 Credits
Introductory Japanese. Includes listening and speaking, with individual
audiolingual practice. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JAPN 102 Japanese II 4.0 Credits
Continues JAPN 101. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: JAPN 101 [Min Grade: C]

JAPN 103 Japanese III 4.0 Credits
Continues JAPN 102. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: JAPN 102 [Min Grade: C]

JAPN 104 Japanese Writing I 3.0 Credits
This course focuses on reading and writing in the Japanese language.
The course introduces the basic elements of the Japanese writing
systems, which include Katakana, Hiragana and Kanji.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: JAPN 101 [Min Grade: C] and JAPN 102 [Min Grade: C]

JAPN 201 Japanese IV 4.0 Credits
This courses includes listening, speaking, reading, and writing practice,
with a focus on cultural competency and conversational skills. Builds on
Japanese 103.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: JAPN 103 [Min Grade: C]

JAPN 202 Japanese V 4.0 Credits
This course includes listening, speaking, reading, and writing practice,
with a focus on cultural competency and conversational skills. Builds on
JAPN 201.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: JAPN 201 [Min Grade: C]

JAPN 310 Advanced Writing and Speaking 4.0 Credits
Provides advanced practice in written and oral communication, including
journalistic, professional, and creative writing. Examines contemporary
cultural contexts through media and news. Taught in Japanese.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: JAPN 202 [Min Grade: C]

JAPN 320 Introduction to Language for the Professions 3.0 Credits
Introduction to communication skills in areas such as contemporary
business, health, and law in a culturally sensitive fashion. Taught in
Japanese.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: JAPN 310 [Min Grade: C]

JAPN 340 Introduction to Power and Resistance 3.0 Credits
Introduction to the analysis of power relations and issues of (in)equality
rooted in contemporary political and socio-economic systems. Taught in
Japanese.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: JAPN 310 [Min Grade: C]

JAPN 350 Introduction to Language, Media, and Society 3.0 Credits
Introduction to the role of language and media in society, including
sociolinguistics, gender, media studies, and communication. Taught in
Japanese.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: JAPN 310 [Min Grade: C]

JAPN 410 Advanced Grammar and Translation 3.0 Credits
Provides advanced grammar instruction and fosters translation and
communication skills within a contemporary cultural context. Taught in
Japanese.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: JAPN 310 [Min Grade: C]

JAPN 411 Introduction to Japanese Stylistics 3.0 Credits
Fourth year of Japanese. Provides advanced practice in comprehension
and written and oral communication. Offered as needed.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 24 credits
Prerequisites: JAPN 303 [Min Grade: C]

JAPN 420 Advanced Studies in Language for the Professions 3.0 Credits
Advanced communication skills in areas such as contemporary business, health, and law in a culturally sensitive fashion. Taught in Japanese.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: JAPN 310 [Min Grade: C]

JAPN 440 Advanced Studies in Power and Resistance 3.0 Credits
Advanced analysis of power relations and issues of (in)equality rooted in contemporary political and socio-economic systems. Taught in Japanese.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: JAPN 310 [Min Grade: C]

JAPN 450 Advanced Studies in Language, Media, and Society 3.0 Credits
Advanced analysis of the role of language and media in society, including sociolinguistics, gender, media studies, and communication. Taught in Japanese.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: JAPN 310 [Min Grade: C]

JAPN 480 Japanese Minor Thesis Course 0.5-4.0 Credits
Independent research study on a topic selected by the student. Independent study is supervised by a faculty member and guided by a plan of study. At the end of the course, the student is required to produce a paper and oral defense on the topic of his paper.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JAPN I199 Independent Study in JAPN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

JAPN I299 Independent Study in JAPN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

JAPN I399 Independent Study in JAPN 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

JAPN I499 Independent Study in JAPN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

JAPN T180 Special Topics in Japanese 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

JAPN T280 Special Topics in Japanese 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JAPN T380 Special Topics in Japanese 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JAPN T480 Special Topics in JAPN 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Judiac Studies

Courses

JUDA 117 Introduction to World Religions 3.0 Credits
This course is meant to be a foundational course for the minor in religious studies. It introduces students to the world religions from an anthropological perspective. Hence the basic concerns of an anthropological approach – worldview, ritual, myth, and so forth – are introduced early and applied to each of the religions studied.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JUDA 201 Jewish Literature and Civilization 3.0 Credits
This course explores the origins of the Jewish people and their core narratives and beliefs that have become the foundations of Jewish civilization and religion, introducing the first five books of the Torah, the Jewish Bible and analyzing its influence. Major events of the Jewish lifecycle and calendar are examined.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JUDA 202 Jewish Life and Culture in the Middle Ages 4.0 Credits
This course is an introductory survey of the history of the Jewish people, their civilization, religion and contacts with other cultures in medieval times. Topics will include the rise of Christianity and Islam, the Talmud, Jewish mysticism and the growth of Ashkenazic and Sephardic Jewry.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JUDA 203 Modern Jewish History 4.0 Credits
This course is an exploration of the social, cultural, political and religious forces that have shaped Jewry the world over from the 18th to the 20th centuries. Topics will include Emancipation and Enlightenment, modern religious movements, socialism, Hebrew and Yiddish literature, the Holocaust, Zionism and the state of Israel.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JUDA 211 American Jewish Experience 3.0 Credits
The course explores communal organization of Jews in America from colonial times until today. Topics include westward expansion, urban neighborhoods, American Jewish religion and culture, and Jewish contributions to American culture. The study of this ethno-religious group elucidates historical issues, such as the immigration legacy, minority rights, discrimination, and intermarriage.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JUDA 212 [WI] Contemporary Jewish Life 3.0 Credits
The course will analyze Jewish social, cultural, and religious activities since the 1970s through four ethnographic community studies and documentary films, aiming to understand the meaning that Jews derive from their beliefs, rituals, and institutions. We will stress identity development over the lifespan and historical issues since the Holocaust and the establishment of the State of Israel.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JUDA 213 Jewish Cultural Tapestry 3.0 Credits
The course examines the different customs and traditions of Jews in various parts of the world throughout history. How do minorities develop and maintain their group identity? How have the Jews evolved both diversity and uniformity of practice and ideology? The focus will be on the geography and history of folk traditions: language, religious practice, foodways, dress, and music. The class will examine the phenomenon of diaspora, the dispersion of a people from its homeland, and will analyze the shared religious culture and the parallel, local specific culture.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JUDA 214 Language and Cultural Diversity in the USA 3.0 Credits
Starting with research on communication patterns of men and women, moving on to the language diversity of African Americans, and then emphasizing the cultural production of various immigrant groups, the predominance of a rich array of languages and cultures will be shown to pertain to most periods of American history. The Yiddish language-based immigrant culture of American Jews will be treated as a case study, dwelling on the rich Yiddish literature created, as well as language-based cultural institutions, such as the press, theater, radio, klezmer music, and film.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JUDA 215 Reconstructing History After Genocide 3.0 Credits
The course explores educational restitution to peoples who are victims of genocide. After conceptualizing the world's responsibility to maintain its cultures and help victims of genocide to recover their history, the class will compare educational efforts to document life before the destruction in places such as Rwanda, the former Yugoslavia and among Native Americans. Our main focus will be the politics of teaching about Polish Jewry, the largest community of Jews before WW II that was destroyed by the Nazis in the Holocaust. Students will evaluate sources that describe Jewish life in one city, Lublin, Poland.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JUDA 216 Yiddish Literature & Culture 3.0 Credits
The course describes the major Jewish culture during the past thousand years. In a lively course stressing the arts and everyday family life, students will be introduced to the multi-faceted Yiddish language and culture. Through study and meetings with community members, students learn how Yiddish both reflects and gives meaning to life. Texts will include English translations of proverbs, folktales, folksongs, prayers, epics, personal diaries, memoirs, drama, films, memorial literature, modern fiction and poetry.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JUDA 221 Anthropology of Interfaith Relations 3.0 Credits
This course is meant to be an elective for anthropology and for the Certificate in Interfaith and Religious Studies. It aims to introduce students to how anthropological and ethnographic analyses can help us understand the variety of ways in which people of different faiths both conflict with and work amicably together.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JUDA 222 Comparative Religious Ethics 3.0 Credits
The eternal teaching of the different religions and how they address such issues as war, sexuality and economics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JUDA 223 Coexistence and Conflict: Jews, Christians, and Muslims in the Early Mediterranean 4.0 Credits
This course investigates the history of interactions among the early Mediterranean's three major monotheistic religious communities: Jews, Christians, and Muslims. The course explores how religious communities understood themselves and each other as well as how and why multi-faith communities sometimes coexisted peacefully, sometimes coexisted tensely, and sometimes exploded into violence.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JUDA 224 Judaism and Christianity: Two Religions or One? 3.0 Credits
The relation between Christianity and Judaism is one of the most misunderstood in the history of thought. Christianity is often considered to be diametrically opposed to Judaism, to be a rejection of the Judaic worldview. Indeed, prominent thinkers in the history of Christianity, such as Martin Luther, have reinforced this position. Yet Christianity was originally a development within Judaism, a sect, so to speak, of Judaism. The earliest Christians were Jewish followers of a Jewish leader and conceived of themselves as faithful Jews. So how did the two religions come to be viewed as opposed? Do elements of Judaism remain as part of the foundation of the new faith of Christianity? Where do the two faiths converge and where do they diverge? This course endeavors to answer these important questions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JUDA 225 Philosophy of Religion 3.0 Credits
Studies various aspects of religious belief and experience from a philosophical standpoint, considering issues such as the definition and existence of God, the nature and course of evil, and the relationship between faith and reason in a religious life.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

JUDA 298 Field Work in Judaic Studies 3.0 Credits
In this course, students will do independent fieldwork within a Jewish communal organization in the USA or abroad, or ethnographic or archeological fieldwork. The plan of the work, weekly time commitment, and periodic reports will be agreed upon in advance by the student and Professor Peltz, Director of Judaic Studies, or another Drexel Judaic Studies faculty member. This is a three-credit elective course for the Louis Stein Judaic Studies Minor. It may also be used as a free elective course for a variety of students.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 2 times for 9 credits

JUDA I199 Independent Study in JUDA 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

JUDA I299 Independent Study in JUDA 3.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 2 times for 9 credits

JUDA I399 Independent Study in JUDA 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

JUDA I499 Independent Study in JUDA 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

JUDA T180 Special Topics in Judaic Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

JUDA T280 Special Topics in Judaic Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

JUDA T380 Special Topics in Judaic Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

JUDA T480 Special Topics in Judaic Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Korean

Courses

KOR 101 Korean I 4.0 Credits
Introductory Korean. Includes listening, speaking and writing, with individual audio-video practice.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

KOR 102 Korean II 4.0 Credits
Introductory Korean. Includes listening, speaking and writing, with individual audio-video practice. Builds on Korean 101.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: KOR 101 [Min Grade: C]

KOR 103 Korean III 4.0 Credits
Introductory Korean. Includes listening, speaking and writing, with individual audio-video practice. Builds on Korean 102.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: KOR 102 [Min Grade: C]

KOR 201 Korean IV 4.0 Credits
This course includes listening, speaking, reading, and writing practice, with a focus on cultural competency and conversational skills. Builds on KOR 103.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: KOR 103 [Min Grade: C]

KOR 202 Korean V 4.0 Credits
This course includes listening, speaking, reading, and writing practice, with a focus on cultural competency and conversational skills. Builds on KOR 201.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: KOR 201 [Min Grade: C]

KOR 310 Advanced Writing & Speaking 4.0 Credits
Provides advanced practice in written and oral communication, including journalistic, professional, and creative writing. Examines contemporary cultural contexts through media and news. Taught in Korean.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: KOR 202 [Min Grade: C]

KOR 320 Introduction to Language for the Professions 3.0 Credits
Introduction to communication skills in areas such as contemporary business, health, and law in a culturally sensitive fashion. Taught in Korean.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: KOR 310 [Min Grade: C]

KOR 350 Introduction to Language, Media, and Society 3.0 Credits
Introduction to the role of language and media in society, including
sociolinguistics, gender, media studies, and communication. Taught in
Korean.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: KOR 310 [Min Grade: C]

KOR 410 Advanced Grammar and Translation 3.0 Credits
Provides advanced grammar instruction and fosters translation and
communication skills within a contemporary cultural context. Taught in
Korean.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: KOR 310 [Min Grade: C]

**KOR 420 Advanced Studies in Language for the Professions 3.0
Credits**
Advanced communication skills in areas such as contemporary business,
health, and law in a culturally sensitive fashion. Taught in Korean.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: KOR 310 [Min Grade: C]

**KOR 450 Advanced Topics in Language, Media, and Society 3.0
Credits**
Advanced analysis of the role of language and media in society, including
sociolinguistics, gender, media studies, and communication. Taught in
Korean. Topics will vary according to the instructor's expertise.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: KOR 310 [Min Grade: C]

KOR 480 Korean Minor Thesis Course 0.5-4.0 Credits
Independent research study on a topic selected by the student.
Independent study is supervised by a faculty member and guided by a
plan of study. At the end of the course, the student is required to produce
a paper and oral defense on the topic of his paper.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

KOR I199 Independent Study in KOR 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

KOR I299 Independent Study in KOR 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

KOR I399 Independent Study in KOR 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

KOR I499 Independent Study in KOR 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

KOR T180 Special Topics in Korean 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

KOR T280 Special Topics in Korean 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

KOR T380 Special Topics in Korean 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

KOR T480 Special Topics in Korean 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Language

Courses

LANG 200 Crossing the Bridge 3.0 Credits
This course is designed for students who are experiencing the "otherness"
of culturally diverse groups through living, studying or working abroad.
Students will integrate and build on their intercultural experiences through
a self-reflective process, and will become aware of the impact the
students' own culture has on these experiences.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

LANG T180 Special Topics in Languages 0.5-12.0 Credits
Provides opportunities in language study commonly not taught in the
Modern Language Program. Course offers intensive language training
and study of the historical, social and cultural imperatives of the country
where the language is spoken. May be repeated for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

LANG T280 Special Topics in Languages 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

LANG T380 Special Topics in Languages 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

LANG T480 Special Topics in Languages 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Legal Studies

Courses

BLAW 201 Business Law I 4.0 Credits
Covers scope and classification of business law and the field of contracts.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

BLAW 202 Business Law II 4.0 Credits
Covers sales, negotiable instruments, personal property, and bailments.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

BLAW 321 Law of Business Organizations 4.0 Credits
Covers agencies, partnerships, corporations, and limited-liability companies.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

BLAW 330 Real Estate 4.0 Credits
Studies real property laws and the various rights, obligations, and limitations pertaining to land ownership. Analyzes the problems, procedures, and documents involved in the acquisition, mortgaging, and transfer of real property.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

BLAW 334 Labor Law 4.0 Credits
Examines state and federal law regulating labor relations. Analyzes employment law and its impact on employment practices.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

BLAW 338 Government Regulation and Business 4.0 Credits
Examines constitutional questions regarding relationship between business and various levels of government in the United States.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

BLAW 340 International Business Law 4.0 Credits
Examines the law of international commercial transactions, trade, licensing, investments, and dispute resolution.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

BLAW 342 Criminal Law 4.0 Credits
Surveys state and federal criminal codes and procedures.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

BLAW 346 Entrepreneurial Law 4.0 Credits
This course is intended to address the various legal and ethical issues that confront individuals and companies in starting up new ventures, either within an existing company or a new start-up company.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

BLAW 348 White Collar Crime 4.0 Credits
Examines the current federal and local criminal codes as they apply specifically to managers and businesses and the enforcement process.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

BLAW 356 Legal Issues in Corporate Governance 4.0 Credits
This course examines the current legal and regulatory environment of corporate governance in the United States. The principal actors in a corporation's governance structure (directors, officers and shareholders) and their roles and responsibilities will be examined. The sources of corporate governance, including laws and regulations, case law, and internal policies and procedures, are studied as well. The course also will analyze and consider the role and applicability of corporate governance in specific case studies and fact patterns, such as Enron and WorldCom.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

BLAW 358 Employment Law 4.0 Credits
Examines and analyzes legal aspects of employment as governed by law and judicial decision, including labor standards, workers' compensation, employment law and employment practices, and employer and employee rights.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

BLAW 360 Intellectual Property and Cyber Law 4.0 Credits
This course presents an overview of the Law of Intellectual Property. It examines patents, copyrights, trademarks and trade secrets together with public policy issues including the Constitution and legislation. It also reviews current regulation and legislation relating to the Internet, including privacy and tort issues.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

BLAW I199 Independent Study in BLAW 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

BLAW I299 Independent Study in BLAW 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

BLAW I399 Independent Study in BLAW 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

BLAW I499 Independent Study in BLAW 1.0-4.0 Credit
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

BLAW T180 Special Topics in BLAW 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

BLAW T280 Special Topics in BLAW 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

BLAW T380 Special Topics in BLAW 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

BLAW T480 Special Topics in BLAW 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

Linguistics

Courses

LING 101 Introduction to Linguistics 0.0-3.0 Credits
Introduces major topics in the study of language, including language acquisition, language change, the social use of language, and the analysis of discourse, and teaches basic techniques in linguistic analysis through the use of a wide variety of language data.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

LING 102 Language and Society 3.0 Credits
Develops understanding of how language is involved with relations of class, ethnicity, gender and aesthetics in society. The course covers the social investigation of language use, politeness in languages, different varieties of English dialects, slang, and rap, bilingualism and languages in immigrant communities, and language planning.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

LING T180 Special Topics in Linguistics 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

LING T280 Special Topics in Linguistics 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

LING T380 Special Topics in Linguistics 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

LING T480 Special Topics in Linguistics 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Management

Courses

MGMT 201 Introduction to Technology Innovation Management 4.0 Credits
This course discusses the basics every manager needs to organize successful technology-driven innovation in both entrepreneurial and established firms. We start by examining innovation-based strategies as a source of competitive advantage and then examine how to build organizations that excel at identifying, building and commercializing technological innovations.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

MGMT 210 Research Methods I 2.0 Credits
This course enables undergraduate students to design research in business and related disciplines. Students develop techniques in the selection and design of appropriate research methodologies in the identification of a research problem in a business environment. The course examines the research process from problem identification and setting through a review of pertinent literature as secondary sources and an examination of the descriptive research design.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

MGMT 211 Research Methods II 2.0 Credits
This course introduces students to the group of approaches to social science and humanistic research known as qualitative inquiry. These approaches include ethnography, grounded theory, phenomenology, case study, and narrative research, and employ methods of interviewing, discourse/content analysis, and participation observation. Technology used includes digital analog recorders, videotape, and software such as Simstat for text 'mining' and coding. Students will explicate studies that employ these approaches; discuss assumptions of qualitative inquiry; discuss standards of sampling, ethics, and validity, and design a qualitative research proposal.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

MGMT 260 Introduction to Entrepreneurship 4.0 Credits
The course focuses on entrepreneurship as a generic activity, including start-ups and corporate entrepreneurship. It explores the opportunities and challenges faced by individuals starting up new ventures and the probable paths of career development for the students pursuing entrepreneurship.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

MGMT 301 Designing Innovative Organizations 4.0 Credits
Designing innovative organizations focuses on effective organizational design in technology innovative organizations, with special emphasis on innovative organizational forms that can provide strategic advantage. Topics include when to use functional, divisional, or matrix organizations, how IT creates new organizational possibilities, and examples of innovative organizational possibilities, such as democratic decision-making, crowd-based organizations, internal resource markets, and other forms of collective intelligence. Team projects include inventing new possibilities for real organizations.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

MGMT 302 Competing in Technology Industries 4.0 Credits
This course provides a set of concepts, tools, and frameworks that are grounded on the theories of strategic management and technological innovation that are necessary to achieve competitive advantages in the technology industries. We will accomplish this objective by using a combination of lectures, class discussions, guest lectures, case memo write-ups, a final exam and a group project that focuses on a live case analysis.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

MGMT 363 Directed Study in Entrepreneurship 4.0 Credits
This course provided student with real experiences in the realm of entrepreneurship under the guidance and direction Baiada Center in Technology Entrepreneurship. This course may not be repeated for credit.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: MGMT 260 [Min Grade: D]

MGMT 364 Technology Management 4.0 Credits
This course focuses on the dynamic of technological innovation and change, in particular, how new technologies create entrepreneurial opportunities. The course examines how industries and firms are transformed by new technologies and what factors affect innovation performance.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

MGMT 365 Business Plan for Entrepreneurs 4.0 Credits
In this course, students learn how to prepare a comprehensive strategy for launching a new business. The vehicle for achieving this is the preparation of a start-up business plan based on a selected opportunity.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: MGMT 260 [Min Grade: D]

MGMT 366 Entrepreneurship Certificate Project 1.0 Credit
This is a capstone special project for the Entrepreneurship Certificate. Students would propose a topic in entrepreneurship that is related to their undergraduate area. The topic would need to be approved by the Management Department Head.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: MGMT 260 [Min Grade: D] and MGMT 365 [Min Grade: D] and ACCT 120 [Min Grade: D]

MGMT 370 For-Profit Business Consulting 4.0 Credits
Faculty and student teams provide business solutions to for-profit organizations. In addition to working closely with faculty, students also interact with and present deliverables to industry leaders from partner organizations. Project scopes vary depending on the organization's needs, but areas of focus can include: finance, marketing, management, technology, etc.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.

MGMT 371 Nonprofit Business Consulting 4.0 Credits
Faculty and student teams provide business solutions to nonprofit organizations. In addition to working closely with faculty, students also interact with and present deliverables to industry leaders from partner organizations. Project scopes vary depending on the organization's needs, but areas of focus can include: business analytics, finance, marketing, management, technology, etc.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.

MGMT 372 Startup Business Consulting 4.0 Credits
Faculty and student teams provide business solutions to startup organizations. In addition to working closely with faculty, students also interact with and present deliverables to industry leaders from partner organizations. Project scopes vary depending on the organization's needs, but areas of focus can include: business analytics, finance, marketing, management, technology, etc.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.

MGMT 380 International Business Consulting 4.0 Credits
Faculty and student teams provide business solutions to international organizations. Ten weeks of the course take place on campus, with student-client interaction facilitated virtually. During the break week immediately following the quarter, students travel abroad on an international residency to present their final recommendations to the partner organization in person. During the one-week residency, students also participate in company visits and cultural experiences. Project scopes vary depending on the organization's needs, but areas of focus can include: business analytics, finance, marketing, management, technology, etc. Students must apply and be selected to participate.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.

MGMT 450 Strategy and Competitive Advantage 4.0 Credits
Provides an integrated approach to business planning. Develops strategic analysis and decision-making through examination of an organization's internal and external environment. Requires written and oral case reports.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: FIN 301 [Min Grade: D] and ORGB 300 [Min Grade: D] and (MKTG 301 [Min Grade: D] or MKTG 201 [Min Grade: D])

MGMT 451 Management Simulation 4.0 Credits
Requires student teams responsible for the operation of competing firms in a computer-simulated dynamic business environment to conduct top management strategic planning, analysis, and social responsibility.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: FIN 301 [Min Grade: D] and ORGB 300 [Min Grade: D] and (MKTG 301 [Min Grade: D] or MKTG 201 [Min Grade: D])

MGMT I199 Independent Study in MGMT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MGMT I299 Independent Study in MGMT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MGMT I399 Independent Study in MGMT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MGMT I499 Independent Study in MGMT 4.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if classification is Junior or Senior.

MGMT T180 Special Topics in MGMT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MGMT T280 Special Topics in MGMT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MGMT T380 Special Topics in MGMT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MGMT T480 Special Topics in MGMT 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

Management Information Systems

Courses

MIS 200 Management Information Systems 4.0 Credits
Introductory course to Management of Information Systems, a core business function. The course examines how information systems (i.e., information technology, people, procedures, and data) help add value to an organization, and integrate the various functional areas of a business (e.g., accounting, marketing, etc.).
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

MIS 261 Introduction to Enterprise Application Software Using SAP - Logistics 4.0 Credits
This course introduces students to the SAP Business Suite, real-life business processes in modern companies, and the fundamental concepts of enterprise application software. A hands-on, case study approach to exploring SAP ERP (enterprise resource planning) capabilities, focusing on Logistics/Operations (procurement, production, and fulfillment) will be used. In addition, associated SAP applications such as Customer Relationship Management and Supply Chain Management, as well as touching on some related solutions such as Analytics, Cloud Computing and In-Memory Computing (SAP HANA) will be discussed. After completing this course, students will be equipped with practical skills and competencies for careers in business and IT where SAP software is universal.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

MIS 262 Intro to Enterprise Application Software Using SAP - Accounting & Analytics 4.0 Credits
This course introduces students to real-life accounting business processes in modern companies, fundamental concepts of enterprise application software like enterprise resource planning (ERP) and methods for reporting and data analysis. We will use SAP ERP and Analytics solutions, taking a hands-on, case study approach to exploring Financial Accounting, Managerial Accounting and related business processes. After completing this course, students will be equipped with practical skills and competencies for careers in business and information technology where SAP software is universal.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: MIS 200 [Min Grade: D] or MIS 300 [Min Grade: D]

MIS 342 Systems Analysis and Design 4.0 Credits
Introduces structured and object-oriented systems analysis and design methodologies in classroom and hands-on lab settings. Discusses system life-cycle concepts and techniques such as dataflow diagrams, structure charts, and E-R diagrams. Also covers object-oriented design, prototyping, and rapid application development approaches.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MIS 300 [Min Grade: D] or MIS 200 [Min Grade: D]

MIS 343 Database Design and Implementation 4.0 Credits
Covers data and file structures, object-oriented database design, and the use of SQL for querying databases. Discusses logical and physical database design and offers hands-on experience with commercial database management systems (DBMSs).
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MIS 200 [Min Grade: D] or MIS 300 [Min Grade: D]

MIS 346 Management Information Systems Strategy 4.0 Credits
To discuss Management of Information Systems, and then to elaborate on its application to organizational change, especially to reengineering. This course will introduce the student to central aspects of MIS policy and strategy in the first part of the course and then use these concepts to understand reengineering in the latter part of the course.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

MIS 347 Domestic and Global Outsourcing Management 4.0 Credits
To introduce the student to issues in managing the outsourcing of Information Systems. This will be done in a mixture of lectures and student team presentations. The lectures will introduce the students to some of the central themes of outsourcing IS by summarizing current literature. Parallel to these lectures students will form study teams to investigate other important topics of IS outsourcing through a guided literature reading.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

MIS 348 Visual Basic Database Programming for Business 4.0 Credits
To introduce Business students to the basic concepts of programming, object oriented thinking, and database programming in the context of business applications.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

MIS 349 Predictive Business Analytics with Relational Database Data 4.0 Credits
Data mining is about creating new information by examining datasets to identify patterns and unknown questions they relate to by applying data modeling and statistical tools. The objective of this course is to introduce students to data mining through Base Programming, applied statistics, and data visualization methods in SAS.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: STAT 202 [Min Grade: D], STAT 206 [Min Grade: D] (Can be taken Concurrently)(MIS 200 [Min Grade: D] or MIS 300 [Min Grade: D])

MIS 351 Introduction to Programming for Business in C# 4.0 Credits
This course is an introductory course to the process and tools necessary to build a complete information system given a specification. In this course, you will learn basic concepts and techniques in computer programming. This course selects Microsoft Visual Studio.Net and C# as the software development environment and programming language. This language and development system is a complete suite of tools for creating stand-alone applications, portions of larger systems, independent objects, complete distributed systems, and active components of the World Wide Web.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: MIS 200 [Min Grade: D] or MIS 300 [Min Grade: D]

MIS 352 Advanced Business Programming with ASP.Net 4.0 Credits
This course builds on the earlier Business Programming with ASP.NET course. Microsoft's ASP.NET is the major web application framework used to develop web-based business applications. This course introduces the student more advanced topics in business application development. In the earlier course, students learned how to build basic web-based applications using web forms, this course moves on to building application logic using C# and connecting to the back-end databases that store corporate data. Students who complete both sequence courses will have to ability to participate in building all components of Web-.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: MIS 200 [Min Grade: D] or MIS 300 [Min Grade: D]

MIS 361 Information System Project Management 4.0 Credits
The course is structured around the key phases of a project lifecycle – initiating a project, planning a project, executing a project, controlling a project, and closing out a project. It also pays specific attention to the nine knowledge areas of Project Management as defined by the Project Management Institute (PMI)'s Project Management Body of Knowledge (PMBOK): project scope, cost, time, integration, quality, communication, risk, human resources, and procurement management. Additionally, students will be introduced with choices in project management approaches (such as SAP Project Management and APM.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: MIS 200 [Min Grade: D] or MIS 300 [Min Grade: D]

MIS I199 Independent Study in MIS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MIS I299 Independent Study in MIS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MIS I399 Independent Study in MIS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MIS I499 Independent Study in MIS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MIS T180 Special Topics in MIS 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MIS T280 Special Topics in MIS 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MIS T380 Special Topics in MIS 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MIS T480 Special Topics in MIS 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

Manufacturing Engineering Technology

Courses

MET 100 Graphical Communication 3.0 Credits
Introduces engineering graphics and fundamentals of computer aided design using the interactive software package AutoCAD on a personal computer.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Freshman.

MET 101 Engineering Materials 3.0 Credits
Study of tests used to characterize properties of ceramic, polymeric, and metallic materials and how material properties influence their use and design for engineering applications. Testing procedures demonstrations.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 111 [Min Grade: D] and (CHEM 113 [Min Grade: D] or CHEM 101 [Min Grade: D])

MET 201 Introduction to Manufacturing Processes 0.0-3.0 Credits
Introduces manufacturing and its managed activities: research and development, production, marketing, industrial relations, and finance. Includes laboratory work in organization, staffing, and operating a model manufacturing enterprise.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore
Prerequisites: MATH 110 [Min Grade: D]

MET 202 Computer-Aided Drafting 4.0 Credits
Introduces computer design using an interactive software package on a microcomputer.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore

MET 204 Applied Quality Control 3.0 Credits
Covers variables, procedures, and processes of total quality control within the manufacturing industries. Includes instrumentation for material evaluation, attribute inspection and sampling, supervising for organizational quality improvements, and statistical control. Emphasizes directed laboratory experiences.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.
Prerequisites: STAT 201 [Min Grade: D]

MET 205 Robotics and Mechatronics 3.0 Credits
Provides a comprehensive technical introduction to robotics and automation in manufacturing. Topics include flow line production, material handling, group technology, and flexible and mechatronics-integrated manufacturing.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (PHYS 103 [Min Grade: D] or PHYS 101 [Min Grade: D]) and MATH 110 [Min Grade: D] or (MATH 121 [Min Grade: C] or MATH 101 [Min Grade: D])

MET 209 Fluid Power 4.0 Credits
Covers the fundamentals of hydraulic/pneumatic systems with an emphasis on applications of Bernoulli's equation. Topics include component types and designs, hydraulic/pneumatic circuit analysis and design of hydraulic/pneumatic systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (PHYS 103 [Min Grade: D] or PHYS 101 [Min Grade: D]) and (PHYS 104 [Min Grade: D] or PHYS 102 [Min Grade: D])

MET 213 Applied Mechanics 4.0 Credits
Applications of statics and strength of materials with applications to problems in manufacturing. A combined statics and strength of materials course with applications in manufacturing, including: design of bolted connections, simple structures, and beam design.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (PHYS 104 [Min Grade: D] or PHYS 102 [Min Grade: D]) and MATH 122 [Min Grade: D] and (MET 101 [Min Grade: D] or ENGR 220 [Min Grade: D])

MET 301 Advanced Design Graphics 3.0 Credits
Covers the theory and practice of industry's parts and assembly drawings with a specialization in tolerance and geometric dimensioning. Discusses industrial procedures and standards.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MET 100 [Min Grade: D]

MET 307 HazMat for Manufacturing 0.0-3.0 Credits
Covers the characteristics of hazardous substances and wastes, medical surveillance for plant personnel, toxicology, respirators and protective clothing, environmental direct reading indicators, decontamination procedures, and safe working practices.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: BIO 161 [Min Grade: D] and CHEM 162 [Min Grade: D] and CHEM 164 [Min Grade: D]

MET 308 Maritime Manufacturing 0.0-3.0 Credits
Provides an overview of the key engineering standards, laws, and regulations governing the construction of commercial vessels in the United States and methods of complying with these requirements. Focuses on the ship manufacturing process and the installation and testing of ship systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.

MET 310 Advanced Robotics and Mechatronics 3.0 Credits
Covers applied topics related to the integration of computer, robotics, and internet-based automation technologies in modern manufacturing.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MET 205 [Min Grade: D]

MET 316 Computer Numerical Control 3.0 Credits
Discusses theory and application of computer numerical control machines in the manufacturing environment. The laboratory focuses on the programming and operation of CNC machine tools.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (MATH 110 [Min Grade: D] or MATH 121 [Min Grade: C] or MATH 101 [Min Grade: D]) and MET 100 [Min Grade: D]

MET 321 Changing World of 3D Printing and Rapid Prototyping 3.0 Credits
This course is an introduction and survey of rapid-prototyping, especially centered on the advent, impact, and utility of 3D printers and supporting digital technology: computer-aided design (CAD) and computer-aided manufacturing (CAM) software. The course will cover both the concepts and practice of 3D printing and prototyping, emphasizing hands-on work developing computer-based design models ("drawings") and fabricating prototypes ("parts") using current tools for desktop manufacturing including 3D printers, laser cutters, desktop engravers, and micromolding and printing. With this knowledge and skill set, students will be able to design, develop and demonstrate a working product suitable for commercialization.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MET 100 [Min Grade: D] or MEM 201 [Min Grade: D]

MET 322 Design for Manufacturing and Assembly 3.0 Credits
One of the final steps in creating a marketable product is the manufacturing of the components. Throughout the design process, engineers must fully understand a variety of processes in which parts can be produced and assembled. Selecting a manufacturing method and ensuring the parts are capable of production is a difficult but critical part of the product design process. This course will allow students to apply the theory of design for manufacturing (DFM) and design for assembly (DFA) to the overall design process. Topics include practical techniques for selection of materials and processes, design considerations for production, manual assembly and automated assembly, and Boothroyd and Dewhurst methods. Students review case studies and analyze production assemblies.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MET 100 [Min Grade: D] and MET 201 [Min Grade: D]

MET 402 Manufacturing Design with CAD 3.0 Credits
Covers design of tools and fixtures for manufacturing, including general-purpose work holders, modular and dedicated fixtures, jigs, fixturing principles, degree of freedom, locating and clamping components, wire frame and solid modeling, and 3d to 2D conversion. Students design models of fixtures.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MET 301 [Min Grade: D]

MET 403 Three Dimensional Modeling 3.0 Credits
Covers three-dimensional design with emphasis on manufacturing and industrial standards. Includes computer-aided-manufacturing using solid, surface, and wire-frame models.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MET 100 [Min Grade: D]

MET 404 Digital Instrumentation 3.0 Credits
Covers digital technology and its application in manufacturing. Covers variables, procedures, and processes of total quality control.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: EET 201 [Min Grade: D]

MET 407 Manufacturing Processes 3.0 Credits
Covers a systematic understanding of the operations, applications, and planning of manufacturing processes. Discusses quantitative evaluations of processing parameters influencing product quality.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (MET 101 [Min Grade: D] or ENGR 220 [Min Grade: D]) and MATH 122 [Min Grade: D]

MET 408 MFG Information Management 3.0 Credits
Covers information management in manufacturing. Topics include cost estimation and control, manufacturing resources planning (MRP), just-in-time (JIT), production and inventory controls, management information systems (MIS), supply chain management (SCM), and other advanced information management technology.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MET 205 [Min Grade: D] and MATH 122 [Min Grade: D]

MET 409 Green Manufacturing 3.0 Credits
Covers life cycle analysis, pollution prevention, recycling, and lean manufacturing, including characteristics of hazardous substances and wastes, medical surveillance for plant personnel, toxicology, respirators and protective, environmental direct reading indicators, decontamination procedures and safe working practices for MFG.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 111 [Min Grade: D] and CHEM 113 [Min Grade: D]

MET 411 Advanced Computer Numerical Control 3.0 Credits
This course covers applied topics related to the integration of computer, CNC machines, and internet-based automation technologies in modern manufacturing.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MET 316 [Min Grade: D]

MET 421 [WI] Senior Design Project I 3.0 Credits
This course constitutes the first course of a three-quarter course sequence. It aims to train the students in identifying projects of relevance to the society, in planning and scheduling a solution, and in entrepreneurial activities that may result from the project. The course is also intended to cover an industrial project starting from the proposal writing and conceptual design to final steps. This course is focused on proposal writing. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.

MET 422 Senior Design Project II 3.0 Credits
This course constitutes the second course of a three-quarter course sequence and continues MET 421. It aims to train the students in maintaining the progress of a project on schedule, including resolving any team conflicts. It also trains them how to prepare oral, and submit written progress reports. The students supply summary reports to his/her advisor. This course is focused on following standard design steps from the conceptual to final design.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MET 421 [Min Grade: D]

MET 423 [WI] Senior Design Project III 3.0 Credits
This is the final installment of a 3 course sequence. The course objective is to train students in a project from the initial conceptual design stage to the preliminary and the final design completion, how to conduct design reviews, and how to document and present findings, design concepts, and conclusion in both oral and written formats. Students are also required to build a working prototype of their final design concept and present it during final presentation of the project.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MET 422 [Min Grade: D]

MET I199 Independent Study in MET 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MET I299 Independent Study in MET 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MET I399 Independent Study in MET 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MET I499 Independent Study in MET 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MET T180 Special Topics in MET 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MET T280 Special Topics in MET 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MET T380 Special Topics in MET 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if classification is Senior.

MET T480 Special Topics in MET 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

Marketing

Courses

MKTG 201 Introduction to Marketing Management 4.0 Credits
Provides a conceptual and applications-oriented framework for marketing decision-making in a dynamic environment. Emphasizes satisfying target customers and achieving organizational objectives through skillful blending of strategies in product development, pricing, promotion, and distribution.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

MKTG 301 Introduction to Marketing Management 4.0 Credits
Provides a conceptual and applications-oriented framework for marketing decision-making in a dynamic environment. Emphasizes satisfying target customers and achieving organizational objectives through skillful blending of strategies in product development, pricing, promotion, and distribution.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

MKTG 321 Selling and Sales Management 4.0 Credits
Covers planning, direction, and control of the personal selling activities of an organization, including recruiting, selecting, training, equipping, assigning, routing, supervising, compensating, motivating, leading, and evaluating a sales force.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: MKTG 301 [Min Grade: C-] or MKTG 201 [Min Grade: C-]

MKTG 322 Advertising & Integrated Marketing Communications 4.0 Credits
Examines advertising principles, techniques, technologies, and methods; artistic and creative aspects; psychological appeals; and production. Covers advertising and promotion management, including organization and planning, problems and strategies, media selection and evaluation, and agency-client relationships.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: MKTG 301 [Min Grade: C-] or MKTG 201 [Min Grade: C-]

MKTG 324 Marketing Channels and Distribution Systems 4.0 Credits
Examines philosophies, concepts, principles, and methods that must be employed to achieve maximum effectiveness and efficient.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: MKTG 301 [Min Grade: C-] or MKTG 201 [Min Grade: C-]

MKTG 326 Marketing Insights 4.0 Credits
Applies analytical tools in the investigation of marketing problems. Emphasizes systematic research design, gathering, and interpretation of information for marketing decision-making.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: MKTG 301 [Min Grade: C-] or MKTG 201 [Min Grade: C-]

MKTG 344 Professional Personal Selling 4.0 Credits
Prepares students for business-to-business personal selling careers. Uses role-playing and experiential exercises to teach the latest strategies and tactics in prospecting and qualifying, planning sales calls, approaching prospects, making sales presentations, negotiating resistance, confirming and closing "win-win" agreements, and servicing customers to ensure satisfaction.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: MKTG 301 [Min Grade: C-] or MKTG 201 [Min Grade: C-]

MKTG 347 New Product Development 4.0 Credits
Analyzes the process of discovering new product opportunities and creating new product ideas that are strategically sound. Covers demand analysis, futuristics, new product strategy, creativity techniques, product evaluation, interacting with research and development departments, and developing a marketing plan.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: MKTG 301 [Min Grade: C-] or MKTG 201 [Min Grade: C-]

MKTG 348 Services Marketing 4.0 Credits
Covers marketing theory, concepts, strategy, and tactics as applied to the unique characteristics and demands of service-oriented industries such as health care, transportation, finance, law, consulting, education, training, tourism, security, entertainment, and hospitality within a global macroenvironment.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: MKTG 301 [Min Grade: C-] or MKTG 201 [Min Grade: C-]

MKTG 351 Marketing for Non-Profit Organizations 4.0 Credits
Applies the marketing concepts of product, price, promotion, distribution, and benefit-cost maximization to the exchange relations of non-profit organizations.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: MKTG 301 [Min Grade: C-] or MKTG 201 [Min Grade: C-]

MKTG 355 Interactive Marketing 4.0 Credits
Addresses the principles, techniques, and methods of direct, interactive marketing in an era of emerging global technologies. Emphasizes field work, projects, and presentations.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: MKTG 301 [Min Grade: C-] or MKTG 201 [Min Grade: C-]

MKTG 356 Consumer Behavior 4.0 Credits
Applies contemporary behavioral science to consumer decision-making, including the relationship between the efforts of business firms in marketing their products and the reactions of ultimate consumers.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: MKTG 301 [Min Grade: C-] or MKTG 201 [Min Grade: C-]

MKTG 357 Global Marketing 4.0 Credits
Examines international involvement of companies from exporting to the multinational enterprise stage. Covers the nature of international competition; distribution systems; pricing and credit policies; promotional methods; trade barriers and agreements; and the cultural, political, legal, ethical, and technological barriers.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: MKTG 301 [Min Grade: C-] or MKTG 201 [Min Grade: C-]

MKTG 362 Brand and Reputation Management 4.0 Credits
The course focuses on the strategic management of product and
organization brands, both corporate and non-profit, and how one can build
brands that are highly distinguished reputationally to enhance financial
value, attract and keep top talent and build relationships with customers,
communities, and other key stakeholders.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: MKTG 301 [Min Grade: C-] or MKTG 201 [Min Grade: C-]

MKTG 363 Brand & Reputation Management Project 1.0 Credit
Analysis of a "real world" organization's corporate brand and reputation
management. Topic and scope must be approved by the Academic
Director of the Center for Corporate Reputation Management. The
integrative experience required for completion of the Certificate in
Corporate Brand and Reputation Management.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: MKTG 362 [Min Grade: D] and MKTG 322 [Min Grade: D]
and COM 181 [Min Grade: D] and (MKTG 201 [Min Grade: C-] or MKTG
301 [Min Grade: C-])

MKTG 364 Marketing for New Ventures 4.0 Credits
Examines the unique marketing challenges faced by entrepreneurs
launching new products and/or services. Topics include: designing new
offerings, targeting customer segments, and marketing on a tight budget.
The course is designed to be useful for small business owners, managers
at large companies, and social entrepreneurs.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: MKTG 301 [Min Grade: C-] or MKTG 201 [Min Grade: C-]

MKTG 365 Digital Marketing 4.0 Credits
Marketing practices have dramatically shifted with the rise of social
media and the proliferation of devices, platforms and applications. This
rapidly changing environment presents new opportunities and challenges
for marketers. Through a combination of case studies, best practice
examples, and the development of social and digital media marketing
plans, students learn how the elements of a digital strategy work together
with traditional media to attract prospective customers.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: MKTG 301 [Min Grade: C-] or MKTG 201 [Min Grade: C-]

MKTG 366 Customer Analytics 4.0 Credits
Customer analytics is about applying (often simple) models to understand
and predict customer behavior. Firms have access to more information
about their customers than ever before. But data alone should not be
confused for knowledge. The role of the model is to summarize patterns
and generate predictions of customer behavior in the future. We will use
simple models from probability theory and stochastic processes as a lens
through which to view customer behavior.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: STAT 201 [Min Grade: C-] or STAT 205 [Min Grade: C-]

MKTG 367 Data-Driven Digital Marketing 4.0 Credits
This course will provide students with an overview of the rapidly-emerging
field of digital marketing. Since digital marketing is constantly changing,
students will become proficient at learning about new digital marketing
platforms, how each channel is used to communicate with customers
and be able to develop a list of "key questions" to ask about any new
marketing medium. Because data and analytics are an important
component of digital marketing, students will also become proficient
at using data to evaluate a marketing campaign. One of the best ways
to assess marketing strategies is through A/B testing and students will
become expert at planning, analyzing and reporting A/B tests. We will
also discuss strategies for integrating data-based decision making into
organizations.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MKTG 301 [Min Grade: C-] or MKTG 201 [Min Grade: C-]

MKTG 368 Corporate Responsibility Management 4.0 Credits
Companies increasingly think about their responsibility to have positive
impact on society and the environment. In fact, some have argued that
this is a sure path to business performance. In actuality, managing
corporate responsibly is filled with pitfalls, contradictions, and dilemmas.
This course will examine both the opportunities and dangers for leaders at
companies large and small.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MKTG 301 [Min Grade: C-] or MKTG 201 [Min Grade: C-]

MKTG 380 Seminar in Marketing Strategy 4.0 Credits
Builds upon marketing concepts learned in other courses and presents
an integrated approach to marketing strategy. Uses a number of real-
life cases and requires students to work in groups and make project
presentations.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: MKTG 301 [Min Grade: C-] or MKTG 201 [Min Grade: C-]

MKTG I199 Independent Study in MKTG 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MKTG I299 Independent Study in MKTG 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MKTG I399 Independent Study in MKTG 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MKTG I499 Independent Study in MKTG 0.5-6.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MKTG T180 Special Topics in MKTG 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MKTG T280 Special Topics in MKTG 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MKTG T380 Special Topics in MKTG 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

MKTG T480 Special Topics in MKTG 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

Materials Engineering

Courses

MATE 100 Materials for Emerging Technologies 2.0 Credits
Evolution of materials engineering; education and the profession;
concepts, tools, and techniques; selection and design using metals,
ceramics, polymers, and composites; application of materials in a
technological society; and materials of the future.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

MATE 101 Fundamentals of Materials 4.0 Credits
Examines principles underlying structure, properties, and behavior of
engineering materials, including metals, ceramics, and polymers. Covers
topics including bonding; crystal structure; defect structure; alloying;
mechanical, electronic, and magnetic properties in relation to structure;
phase equilibria; phase transformations; and oxidation and corrosion. All
terms.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 102 [Min Grade: D] and MATH 122 [Min Grade: D]
and PHYS 101 [Min Grade: D]

MATE 120 Modern Materials in Your World 3.0 Credits
This undergraduate level introductory course in modern materials
is designed as an elective course for non-engineering majors. It will
introduce the field of materials science and engineering while stressing
the importance of materials selection in modern day products. In addition,
the course will highlight the importance of sustainable materials in product
life cycle design in order to minimize environmental effects.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is BME

**MATE 121 Mechanical Behavior of Materials for Product Design 1.0
Credit**
This course introduces Product Design majors to mechanical behavior
considerations for materials selection.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PROD.
Corequisite: MATE 120

MATE 214 Introduction to Polymers 4.0 Credits
Covers polymer molecular structure, polymerization methods, semi-
crystalline polymers, glass transition, polymer solution in blends,
mechanical properties, and characterization methods.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (MATE 221 [Min Grade: D] or MATE 230 [Min Grade: D])
and (ENGR 231 [Min Grade: D] or MATH 261 [Min Grade: D] or MATH
201 [Min Grade: D]) and CHEM 241 [Min Grade: D]

MATE 230 Fundamentals of Materials II 4.0 Credits
This course continues the introduction to materials science and
engineering from ENGR 220 by exploring additional topics including
phase diagrams, phase transformations, mechanical behavior of
materials, thermal properties, environmental considerations and society
impacts. In addition, the course introduces concepts of data collection
and analysis as it relates to mechanical property testing. The course also
addresses techniques for successful technical communication.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ENGR 220 [Min Grade: D]

MATE 240 Thermodynamics of Materials 4.0 Credits
Covers the fundamental laws of thermodynamics, statistical meaning of
entropy, thermodynamic functions, heat capacity, reactions in gases and
condensed phases, phase diagrams, solutions, and reaction equilibria in
condensed solutions.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (MATE 221 [Min Grade: D] or MATE 230 [Min Grade: D])
and ENGR 210 [Min Grade: D]

MATE 245 Kinetics of Materials 4.0 Credits
Covers chemical reaction kinetics, thermodynamics and structure of
crystal defects, diffusion equations and numerical methods of solution,
kinetics in interfacial phenomena, and diffusional transformations.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATE 240 [Min Grade: D]

MATE 280 Advanced Materials Laboratory 4.0 Credits
The goal of the course is to introduce students to state-of-the-art
experimental techniques for analysis of structure, composition and
properties of materials. Electron microscopy, Raman spectroscopy,
indentation and thermal analysis will be described.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ENGR 220 [Min Grade: D] and ENGR 202 [Min Grade: D]

MATE 315 Processing Polymers 0.0-4.5 Credits
Covers polymer processing, viscous flow and melt rheology, injection molding, extrusion, mechanical behavior, and applications and design.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATE 214 [Min Grade: D]

MATE 341 Defects in Solids 3.0 Credits
Main classes of crystalline defects: vacancies, dislocations, stacking faults, surfaces, grain boundaries, geometry, energy considerations, and movement of defects. Defects in specific crystallographic systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MSE.
Prerequisites: MATE 355 [Min Grade: D]

MATE 345 Processing of Ceramics 4.5 Credits
Covers powder production, materials characterization, stability of powder suspensions, rheological and viscoelastic properties of slurries, green-body consolidation, drying, sintering, and structure-property relationships.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATE 355 [Min Grade: D] (Can be taken Concurrently)

MATE 351 Electronic and Photonic Properties of Materials 4.0 Credits
Electrons, principles of quantum mechanics, bonding, free electrons, and band theory solids; lattice vibrations, electronic and vibrational heat capacity; semiconductors and semiconductor devices; dielectrics, magnetic and optoelectronic materials and devices; superconductivity; applications and implications for energy-harvesting, conversion and storage.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MATE 355 [Min Grade: D] (Can be taken Concurrently)

MATE 355 Structure and Characterization of Crystalline Materials 3.0 Credits
Bonding in solids; classification of metals, semiconductors, and insulators; crystal systems; crystallographic systems in specific engineering materials, relationships, X-ray generation, X-ray absorption and emission; reciprocal space; geometric representation of crystals, small and wide angle scattering, electron microscope imaging and diffraction.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MSE.
Prerequisites: ENGR 220 [Min Grade: D] and (MATE 221 [Min Grade: D] or MATE 230 [Min Grade: D])

MATE 366 [WI] Processing of Metallic Materials 4.5 Credits
Covers solidification processing, casting and welding, heat flow analysis, solid-state transformations, precipitation hardening, transformations in steels, martensite transformations, and industrial case studies. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATE 245 [Min Grade: D] and MATE 341 [Min Grade: D]

MATE 370 Mechanical Behavior of Solids 3.0 Credits
Covers continuum mechanics: three-dimensional stress and strain, hydrostatic and deviatoric components, and isotropic elasticity; Mises yield criterion; fracture criteria; linear elastic fracture mechanics; materials selection; defect-tolerant and defect-free fatigue design; notch effects; and statistics of variation.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (MATE 221 [Min Grade: D] or MATE 230 [Min Grade: D]) and (ENGR 231 [Min Grade: D] or MATH 261 [Min Grade: D] or MATH 201 [Min Grade: D])

MATE 410 Case Studies in Materials 3.0 Credits
Covers interaction of materials processing and design, materials selection, the design-failure interface, cost and capacity in manufacturing. Taught via case studies.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATE 221 [Min Grade: D] or MATE 230 [Min Grade: D]

MATE 450 The Nuclear Fuel Cycle & Materials 3.0 Credits
Nuclear fuel cycle, including extraction, enrichment, transmutation in a nuclear reactor, reprocessing, waste processing, repository performance. Materials for nuclear reactors, mechanical and thermal performance, radiation damage.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ENGR 220 [Min Grade: D] and (MEM 371 [Min Grade: D] or ECEP 404 [Min Grade: D]) and ECEP 402 [Min Grade: D]

MATE 455 Biomedical Materials 3.0 Credits
Familiarizes students with natural tissues and the implants designed to replace them, treating both components as engineering materials. Includes a review of fundamental topics of materials structure and testing, and case studies.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

MATE 458 Advanced Biomaterials 3.0 Credits
Tissue Engineering, matrices, cells, scaffold, engineering properties, constitutive relations, absorbable polymers, cell seeding, cellular isolation, cell-scaffold interaction. May be repeated for credit.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if classification is Senior.

MATE 460 Engineering Computational Laboratory 4.0 Credits
Covers numerical techniques, finite differences and finite elements, convergence, and applications in engineering design.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (MATE 221 [Min Grade: D] or MATE 230 [Min Grade: D]) and ENGR 232 [Min Grade: D] and MATH 200 [Min Grade: D]

MATE 473 Electronic, Magnetic and Optical Characterization of Energy Materials 3.0 Credits
This course will examine the selection criteria for component materials in each of these applications and cover how critical properties – electronic conductivity, mobility, ionic conductivity, magnetization, optical absorption, Seebeck coefficient – are measured.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MATE 351 [Min Grade: D]

MATE 476 Recycling of Materials 3.0 Credits
This course will examine the selection criteria for recycling component materials. Recycling involves both reusing materials for energy applications and reprocessing materials into new products.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MATE 240 [Min Grade: D] and MATE 245 [Min Grade: D]

MATE 482 Materials for Energy Storage 3.0 Credits
The course will address principles of operation of electrochemical energy storage devices and describe materials used in those devices.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: ENGR 220 [Min Grade: D]

MATE 483 Environmental Effects on Materials 3.0 Credits
Environmental degradation is explored with a focus on electrochemical corrosion reactions in metals and alloys due to atmospheric, aqueous, chemical or elevated temperature exposure. In addition, high temperature degradation of ceramics and degradation of polymers due to exposure to heat, light and chemicals will be addressed. The role of these environmental effects during service and the impact on performance and reliability will be explored.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MATE 245 [Min Grade: D]

MATE 491 [WI] Senior Project Design I 2.0 Credits
Introduces the design process, including information retrieval, problem definition, proposal writing, patents, and design notebooks. Includes presentations on problem areas by experts from industry, government, and education. This is a writing intensive (WI) course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: MATE 280 [Min Grade: D] and MATE 370 [Min Grade: D] and MATE 315 [Min Grade: D] and MATE 351 [Min Grade: D]

MATE 492 Senior Project Design II 3.0 Credits
Continues MATE 491. Requires written and oral progress reports.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: MATE 491 [Min Grade: D]

MATE 493 [WI] Senior Project Design III 3.0 Credits
Continues MATE 492. Requires written and oral final reports, including oral presentations by each design team. This is a writing intensive (WI) course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: MATE 492 [Min Grade: D]

MATE I199 Independent Study in MATE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MATE I299 Independent Study in MATE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MATE I399 Independent Study in MATE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MATE I499 Independent Study in MATE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

MATE T180 Special Topics in MATE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MATE T280 Special Topics in MATE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MATE T380 Special Topics in MATE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MATE T480 Special Topics in MATE 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

Mathematics

Courses

MATH 004 Trigonometry 0.0 Credits
Required for all students who did not have high school trigonometry and for those who did not pass the placement test in trigonometry. Covers the rectangular coordinate system and distance formula, angular measure and trigonometric functions of a number, variations and graphs of the trigonometric functions, trigonometric identities and equations, inverse trigonometric functions, and solutions of triangles applications. All terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

MATH 049 Elements of College Algebra 0.0 Credits
Topics in algebra including linear, quadratic, rational, and radical expressions, properties of exponents, and introduction to functions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

MATH 050 Elements of Precalculus 0.0 Credits
This course covers topics essential for the study of calculus, including elements of algebra, geometry and trigonometry.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

MATH 100 Fundamentals of Mathematics 3.0 Credits
Course covers properties of real numbers, algebraic expressions, rational expressions, linear and quadratic functions and graphs. This course is intended to give students the background needed to enroll in MATH 101.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Freshman or Sophomore .
Corequisite: EXAM 082

MATH 101 Introduction to Analysis I 4.0 Credits
Covers linear, quadratic, exponential, and logarithmic functions; systems of linear equations; elementary linear programming; matrix algebra; inverse; and mathematics of finance.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 100 [Min Grade: C-] or MATH 049 [Min Grade: CR] or APEM 070 or APC 060
Corequisite: EXAM 080

MATH 102 Introduction to Analysis II 4.0 Credits
Covers limits, continuity, derivatives, indefinite and definite integrals, and applications.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 101 [Min Grade: D] or MATH 172 [Min Grade: C-]
Corequisite: EXAM 080

MATH 105 Algebra, Functions, and Trigonometry 6.0 Credits
Properties of real numbers, algebraic expressions, rational expressions, linear and quadratic functions and graphs, and additional topics from algebra. Topics from geometry and trigonometry essential for the study of calculus.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: EXAM 082

MATH 107 Probability and Statistics for Liberal Arts 3.0 Credits
Probability and statistics in everyday life. The pitfalls of interpreting statistical data. A basic introduction to probability, chance, and gambling. Examples include coin-tossing, dice and roulette wheels.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 100 [Min Grade: D] or MATH 101 [Min Grade: D] or APEM 060

MATH 108 Mathematics for Nursing Professionals 3.0 Credits
Math foundations needed in the calculation of dosages and solutions of medications. Topics include systems of measurement and calculating dosages involving tablets, capsules, liquids, and powders.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

MATH 109 Practicum for Math 110 1.0 Credit
This supplement to MATH 110 emphasizes team-based approaches to working and learning, regular problem solving, and an appreciation for how mathematics is connected with other disciplines. Individual drills, small-group problem sets, and in-class discussion will reinforce the concepts in MATH 110 and develop learning strategies that are useful in other courses.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: MATH 110

MATH 110 Precalculus 3.0 Credits
Reviews topics from algebra, geometry, and trigonometry essential for the study of calculus. For students planning to take Calculus I.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Freshman.
Prerequisites: MATH 049 [Min Grade: CR] or MATH 100 [Min Grade: C] or APC 060
Corequisite: EXAM 082

MATH 111 Practicum for Math 116 1.0 Credit
The purpose of this course is to improve the study habits and learning strategies that are essential for success in MATH 116 and other math courses. This course emphasizes team-based approaches to working and learning, regular problem solving, and an appreciation for how mathematics is connected with your discipline. Through individual drills, small-group problem sets, and in-class discussion we will reinforce concepts taught in your freshman mathematics sequence.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: MATH 116

MATH 112 Practicum for Math 121 1.0 Credit
The purpose of MATH 112 is to improve the study habits and learning strategies that are essential for success in MATH 121 and other math courses. MATH 112 emphasizes team-based approaches to working and learning, regular problem solving, and an appreciation for how mathematics is connected with your discipline. Through individual drills, small-group problem sets, and in-class discussion we will reinforce concepts taught in your freshman mathematics sequence.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: MATH 121

MATH 113 Practicum for Math 122 1.0 Credit
The purpose of MATH 113 is to improve the study habits and learning strategies that are essential for success in MATH 122 and other math courses. MATH 113 emphasizes team-based approaches to working and learning, regular problem solving, and an appreciation for how mathematics is connected with your discipline. Through individual drills, small-group problem sets, and in-class discussion we will reinforce concepts taught in your freshman mathematics sequence.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: MATH 122

MATH 114 Practicum for Math 117 1.0 Credit
The purpose of this course is to improve the study habits and learning strategies that are essential for success in Calculus and Function II (MATH 117) and other math courses. This course emphasizes team-based approaches to working and learning, regular problem solving, and an appreciation for how mathematics is connected with your discipline. Through individual drills, small-group problem sets, and in-class discussion we will reinforce concepts taught in your freshman mathematics sequence.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: MATH 117

MATH 115 Practicum for MATH 200 1.0 Credit
The purpose of MATH 115 is to improve the study habits and learning strategies that are essential for success in MATH 200 and other math courses. MATH 115 emphasizes team-based approaches to working and learning, regular problem solving, and an appreciation for how mathematics is connected with your discipline. Through individual drills, small-group problem sets, and in-class discussion we will reinforce concepts taught in your freshman mathematics sequence.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: MATH 200

MATH 116 Calculus and Functions I 4.0 Credits
This is the first course in a two-term sequence designed to introduce students to key concepts from differential calculus while reviewing essential topics from algebra, geometry, and precalculus. Material includes limits and derivatives of algebraic functions and applications.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 049 [Min Grade: CR] or MATH 100 [Min Grade: C] or APC 060
Corequisite: EXAM 082

MATH 117 Calculus and Functions II 4.0 Credits
This is the second course in a two-term sequence designed to introduce students to key concepts from differential calculus while reviewing essential topics from algebra, geometry, and precalculus. Material includes limits and derivatives of transcendental functions and applications.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 116 [Min Grade: C-]
Corequisite: EXAM 082

MATH 119 Mathematical Foundations for Design 0.0-4.0 Credits
This course serves as an introduction to the mathematical concepts and tools most useful to students majoring in the Design Arts. Topics include functions, graphs, plane and fractal geometry, trigonometry, polar coordinates, and elementary topology.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Freshman or Sophomore .
Corequisite: EXAM 080

MATH 121 Calculus I 4.0 Credits
Functions, limits and continuity, derivatives, trancendental functions, and applications.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Freshman.
Prerequisites: MATH 050 [Min Grade: CR] or MATH 110 [Min Grade: C-] or MATH 105 [Min Grade: C-] or APC 070 or APC2 070
Corequisite: EXAM 080

MATH 122 Calculus II 4.0 Credits
Definite integrals, Fundamental Theorem of Calculus, integration techniques, applications of integration, numerical integration and differential equations.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 121 [Min Grade: C-] or MATH 117 [Min Grade: C-]
Corequisite: EXAM 080

MATH 123 Calculus III 0.0-4.0 Credits
Differential equations, Taylor's theorem, sequence and series, convergence, power series.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 122 [Min Grade: D]
Corequisite: EXAM 080

MATH 171 Introduction to Analysis A 3.0 Credits
Polynomials (including linear and quadratic functions), exponential and logarithmic functions, financial applications, matrices, inverse matrices, and solutions of linear systems.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 100 [Min Grade: C-] or MATH 049 [Min Grade: CR] or APEM 070 or APC 060

MATH 172 Introduction to Analysis B 3.0 Credits
Matrices, inverse matrices, and solutions of linear systems, limits, continuity, rates of change and derivatives, techniques of differentiation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 171 [Min Grade: C-] or MATH 101 [Min Grade: D]

MATH 173 Introduction to Analysis C 3.0 Credits
Applications of differentiation (including graphing and optimization), definite and indefinite integrals, techniques of integration, applications of integration.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 172 [Min Grade: C-]

MATH 180 Discrete Computational Structures 4.0 Credits
Covers basic concepts of discrete mathematics that are important to computing, including elementary set theory, recurrence relations, and graph theory.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 102 [Min Grade: D] or MATH 121 [Min Grade: D] or MATH 172 [Min Grade: C-]

MATH 181 Mathematical Analysis I 0.0-3.0 Credits
Covers set theory, coordinate systems and graphs, functions, linear programming (geometric approach), matrices and linear systems, and linear programming (algebraic approach). Required for architecture, business administration, and construction management students. Non-credit for engineering and science students. Fall, Winter.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

MATH 182 Mathematical Analysis II 3.0 Credits
Covers counting techniques, probability, statistics, and probability applications. Non-credit for engineering and science students. All terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 181 [Min Grade: D]

MATH 183 Mathematical Analysis III 3.0 Credits
Covers limits, rates of change, derivatives, applications of differentiation, exponential and logarithmic functions, integrals, techniques of integration, applications of integration. Non-credit for engineering and science students. All terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 181 [Min Grade: D]

MATH 200 Multivariate Calculus 4.0 Credits
Vectors, curves, partial derivatives, gradient, constrained optimization, coordinate system, multiple integrals, and applications.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 122 [Min Grade: D]
Corequisite: EXAM 080

MATH 201 Linear Algebra 4.0 Credits
Systems of linear equations, matrix algebra, determinants, vector spaces, eigenvalues and eigenvectors, orthogonality, diagonalization, applications.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 121 [Min Grade: D]
Corequisite: EXAM 081

MATH 205 Survey of Geometry 3.0 Credits
Axiomatic approach to geometry: plane geometry, transformational geometrics, and an introduction to classical non-Euclidean geometries. Includes experimental approaches using appropriate software tools.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 201 [Min Grade: D] or MATH 261 [Min Grade: D]

MATH 210 Differential Equations 4.0 Credits
Covers solution methods and properties for scalar and vector differential equations. Topics include linear and nonlinear equations, numerical methods, separation of variables, and transform methods.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 200 [Min Grade: D] and MATH 201 [Min Grade: D]

MATH 220 [WI] Introduction to Mathematical Reasoning 3.0 Credits
A transition course that develops the reasoning skills necessary for later courses. Emphasizes writing and presentation skills. Topics taken from set theory, logic, induction, relations, functions, and properties of the real number system.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

MATH 221 Discrete Mathematics 3.0 Credits
Elementary set theory, combinatorics, elementary number theory, graphs, and special topics chosen from formal language theory, graph algorithms, coding theory, and other applications.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 220 [Min Grade: C] or CS 270 [Min Grade: D] or ECE 200 [Min Grade: D]
Corequisite: EXAM 081

MATH 222 [WI] Combinatorics 3.0 Credits
Select combinatorial topics such as recurrence relations, generating functions, inclusion-exclusion, and graph theory. Emphasis on techniques for writing mathematical arguments and proofs.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 220 [Min Grade: C]

MATH 235 Math Competition Problem Solving Seminar 0.5-4.0 Credits
Problems from math competitions (such as the Putnam exam) are solved by students in this course.This course may be repeated four times for credit as topics vary.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 4 times for NaN credits
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 200 [Min Grade: D]

MATH 238 History of Mathematics 3.0 Credits
This course explores the history of mathematical concepts. Both the people involved and the environment in which the developments took place will be studied. Mathematics from the time of Babylonia to the present will be discussed. The presentation will take a thematic approach, which may vary each term.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

MATH 239 Mathematics for the Life Sciences 4.0 Credits
A broad survey of mathematical topics that are fundamental for application in the life science: multivariate calculus, differential equations, elementary probability. Emphasis on application.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 102 [Min Grade: D] or MATH 122 [Min Grade: D]

MATH 250 Mathematics of Investment and Credit 3.0 Credits
Interest Rate Measurement, Valuation of Annuities, Loan Repayment,Bond Valuation Recommended for students taking actuarial exam FM2.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 123 [Min Grade: D]

MATH 261 Linear Algebra 3.0 Credits
Covers matrix arithmetic systems of linear equations, including vector spaces, coordinate systems, determinants, characteristic value problems, and Euclidean spaces, and application to quadratic forms and linear differential equations. Problems from engineering and science will be solved using applications such as MATLAB during the lab.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 122 [Min Grade: D]

MATH 262 Differential Equations 3.0 Credits
Covers solutions of first-order equations, undetermined coefficient and variation of parameter methods of solution of higher order linear equations, systems of equations, and Laplace transform. Problems from engineering and science will be solved using applications such as MATLAB during the lab.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 261 [Min Grade: D]

MATH 285 Differential Equations II 3.0 Credits
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 210 [Min Grade: D]

MATH 291 Complex and Vector Analysis for Engineers 4.0 Credits
Complex and Vector Analysis for Engineers. Covers gradient, divergence, and curl; integral theorems curvilinear coordinates, complex differentiation and integration, Cauchy's Theorem, power series, residues and applications.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 200 [Min Grade: D] and PHYS 102 [Min Grade: D]

MATH 300 Numerical Analysis I 4.0 Credits
The course covers root finding and fixed points, polynomial interpolation, splines, numerical integration and numerical differentiation. The course emphasizes computational solutions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 200 [Min Grade: D] and (MATH 201 [Min Grade: D] or MATH 261 [Min Grade: D]) and (CS 171 [Min Grade: D] or CS 123 [Min Grade: D])

MATH 301 Numerical Analysis II 3.0 Credits
A continuation of MATH 300. This course focuses on time dependent problems. It includes numerical solution of ordinary differential equation, the heat and wave equations, and moving interfaces. The discussed techniques include implicit schemes or ODEs, finite differences, spectral methods and the level set method.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 300 [Min Grade: D]

MATH 305 Introduction to Optimization Theory 4.0 Credits
Provides a broad survey of mathematical techniques in optimization theory used in operations research and management science. Includes topics selected from the following categories: linear programming, integer programming, network flows, and nonlinear programming.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 201 [Min Grade: D] or MATH 261 [Min Grade: D]

MATH 310 Probability and Statistics 4.0 Credits
Not open to mathematics or computer science majors. Covers probability, probability distribution of discrete and continuous random variables, moment-generating functions, distribution of sample statistics, estimation and statistical tests, tests for goodness of fit, and regression analysis.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is CS or major is MATH or classification is Freshman
Prerequisites: MATH 200 [Min Grade: D]

MATH 311 Probability and Statistics I 4.0 Credits
Discrete and continuous probability distributions, conditional probabilities, expected value and variance, joint probability distributions,marginal distributions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 200 [Min Grade: D]
Corequisite: EXAM 081

MATH 312 Probability and Statistics II 4.0 Credits
Covers estimation, consistency, unbiasedness, maximum likelihood, confidence intervals, hypothesis testing, Type I and Type II errors, Neyman Pearson lemma, likelihood ratio tests, and tests for means and variances.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 311 [Min Grade: D]
Corequisite: EXAM 081

MATH 316 Mathematical Applications of Symbolic Software 3.0 Credits
Mathematical Applications of Symbolic Software. Topics from calculus are investigated via complex problems requiring the use of symbolic mathematical software, primarily Maple. Numerical, graphical, and algebraic approaches are integrated. Limits, derivatives, root-finding, integration, and infinite series are explored in this context.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 123 [Min Grade: D] and MATH 200 [Min Grade: D]

MATH 318 [WI] Mathematical Applications of Statistical Software 3.0 Credits
Mathematical Applications of Statistical Software. Applications of modern statistical technologies and software, such as SAS, are used to describe and analyze data. Some topics covered are data management, collecting data, inferences for single and multiple population means, proportions count data, regression, correlation and nonparametric statistical methods. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 310 [Min Grade: D] or MATH 312 [Min Grade: D]

MATH 319 Techniques of Data Analysis 4.0 Credits
An applied course that considers the acquisition, analysis, visualization, and presentation of data. Emphasizes computation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 318 [Min Grade: D]

MATH 320 Actuarial Mathematics 3.0 Credits
Covers probability in a risk management context. Univariate probability distribution including binomial, negative binomial, Poisson, uniform, exponential, normal, lognormal, Pareto, and Weibull distributions. Multivariate distributions including conditional and marginal probability distributions, joint moment generating functions, probability and moments for linear combinations of independent random variables and related topics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 311 [Min Grade: D]

MATH 321 Vector Calculus 4.0 Credits
Covers vector algebra; gradient, divergence, curl, and curvilinear coordinates; Green's theorem, divergence theorem, and Stokes' theorem; and applications.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (MATH 201 [Min Grade: D] or MATH 261 [Min Grade: D]) and MATH 200 [Min Grade: D]

MATH 322 Complex Variables 4.0 Credits
Introduces functions of one complex variable. Topics include the basic properties of analytic functions, power series, integration, residues and poles, and conformal mapping with applications.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 210 [Min Grade: D] or MATH 262 [Min Grade: D]

MATH 323 Partial Differential Equations 4.0 Credits
Covers basic concepts and solution techniques for the standard partial differential equations of mathematical physics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 210 [Min Grade: D] or MATH 262 [Min Grade: D]

MATH 331 Abstract Algebra I 4.0 Credits
Covers theory of groups, homomorphism and isomorphism, theory of rings, integral domains, ideals, unique factorization, and theory of fields.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (MATH 220 [Min Grade: C-] or CS 270 [Min Grade: C-]) and (MATH 201 [Min Grade: D] or MATH 261 [Min Grade: D] or ENGR 231 [Min Grade: D])

MATH 332 Abstract Algebra II 3.0 Credits
Covers further topics in abstract algebra, including canonical decomposition of linear transformation, bilinear forms, multilinear algebra and determinants, finite fields, and selected short subjects.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 331 [Min Grade: C-]

MATH 387 Linear Algebra II 3.0 Credits
Covers linear transformations, including kernel and range; eigenvalues and eigenvectors; diagonalization of symmetric matrices; and application to differential equations, quadratic forms, and Markov chains. Fall.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 261 [Min Grade: D] or MATH 201 [Min Grade: D]

MATH 401 Elements of Modern Analysis I 3.0 Credits
Covers the real number system, elementary topology, limits, infinite
series, continuity, derivatives, and the Riemann integral.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (MATH 220 [Min Grade: C-] or CS 270 [Min Grade: C-])
and (MATH 201 [Min Grade: D] or MATH 261 [Min Grade: D] or ENGR
231 [Min Grade: D]) and MATH 200 [Min Grade: D]

MATH 402 Elements of Modern Analysis II 3.0 Credits
Covers continuation of integration theory, improper integrals, sequences
and series, power series, and uniform convergence.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 401 [Min Grade: C-]

MATH 410 Scientific Data Analysis I 3.0 Credits
Fundamental principles and applications of statistics for scientific data
analysis. Topics include data exploration, principles of probability
distributions, Central Limit Theorem, hypothesis testing, z, t and F tests,
one-way analysis of variance, linear regression, and contingency table
analysis. Programming statistical applications in R will be included.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 122 [Min Grade: D] or MATH 239 [Min Grade: D]

MATH 411 Scientific Data Analysis II 3.0 Credits
Scientific data analysis and experimental design. Topics include multiple
regression and model selection, nonlinear and logistic regression,
analysis of covariance, multi-factor analysis of variance, nested, factorial
and repeated measures experimental designs, random effects, and
introduction to bootstrap methods and randomization tests. Programming
statistical applications in R will be included.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 410 [Min Grade: C-]

MATH 422 Introduction to Topology 4.0 Credits
Covers topological space, metric spaces, function, continuity,
compactness, and connectedness.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 220 [Min Grade: C]

MATH 449 Mathematical Finance 3.0 Credits
This course is an introduction to the mathematics of finance. The
main topics include: fixed income mathematics (duration, convexity,
compounding conventions, immunization of bond portfolios, yield curve
stripping), foundations of the arbitrage theory (pricing of futures and
forwards, swaps, put/call parity) and introduction to stochastic derivative
pricing (Black-Scholes and beyond).
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 311 [Min Grade: D]

MATH 450 Introduction to Graph Theory 3.0 Credits
Introduction to Graph Theory. Topics covered include paths and cycles,
Eulerian graphs, Hamiltonian graphs, trees, matching, coloring, planarity,
and some additional topics in special graphs such as interval graphs.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: (MATH 201 [Min Grade: D] or MATH 261 [Min Grade: D])
and (MATH 221 [Min Grade: D] or MATH 222 [Min Grade: D])

MATH 475 Cryptography 3.0 Credits
Classic cryptosystems, elementary number theory, RSA, ElGamal,
discrete logarithms, digital signatures, plus a special topic selected from
elliptic curves, information theory, and quantum cryptography.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: (MATH 201 [Min Grade: D] or MATH 261 [Min Grade: D])
and MATH 311 [Min Grade: D]

MATH 483 Discrete Event Simulation 3.0 Credits
Covers system simulation, Monte Carlo methods, discrete event modeling
techniques, queuing models, programming considerations, statistical
definitions and concepts, random number generation, output analysis, and
design of computer experiments.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 311 [Min Grade: C]

MATH 489 Tensor Calculus 3.0 Credits
Covers tensor algebra, including coordinate transformations, fundamental
quadratic form, covariant and contravariant tensors, Riemannian metric,
and applications.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (MATH 201 [Min Grade: C] or MATH 261 [Min Grade: C]
or ENGR 231 [Min Grade: C]) and MATH 200 [Min Grade: C]

MATH I199 Independent Study in MATH 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

MATH I299 Independent Study in MATH 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

MATH I399 Independent Study in MATH 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

MATH I499 Independent Study in MATH 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

MATH T180 Special Topics in Mathematics 0.0-12.0 Credits
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

MATH T185 Special Topics 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Corequisite: EXAM 082

MATH T186 Special Topics 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Corequisite: EXAM 082

MATH T280 Special Topics in Mathematics 0.0-12.0 Credits
Covers topics in pure or applied mathematics. Different topics may be considered in different quarters.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

MATH T380 Special Topics in MATH 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

MATH T480 Special Topics in Mathematics 0.0-12.0 Credits
Covers topics in Mathematics of interest to students or faculty. Different topics may be considered during different quarters.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Mathematics Education

Courses

MTED 417 Mathematics Methods and Content: Early Childhood 3.0 Credits
Students will know and effectively deliver standards-based academic math content, based on age appropriate understanding, and individual and groups needs including a respect for the unique needs of all types of learners. This course requires additional field experience hours.
College/Department: School of Education
Repeat Status: Not repeatable for credit

MTED 418 Mathematics Methods and Content 3.0 Credits
Course emphasizes diagnostic instruction in mathematics by allowing students to complete problems that their students will be expected to work, noting the error and correction process, as well as gaining an awareness of student difficulties in mathematics.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: MTED 417 [Min Grade: B]

MTED 419 Teaching Secondary Mathematics 3.0 Credits
This course emphasizes the major issues in learning and teaching mathematics in the secondary school. Topics will include instructional practices, learning theories, philosophies of assessment, and curriculum in the secondary school. Throughout the course, emphasis will be placed on the appropriate use of technology. Additional field-based experiences are required.
College/Department: School of Education
Repeat Status: Not repeatable for credit

MTED 428 Cultural and Historical Significance of Mathematics 3.0 Credits
The course explores how mathematics reflects and influences the ideas and movements in culture, history, biography and philosophy. An emphasis on teaching methods is integrated throughout the course.
College/Department: School of Education
Repeat Status: Not repeatable for credit

Mechanical Engineering & Mechanics

Courses

MEM 201 Foundations of Computer Aided Design 0.0-3.0 Credits
Covers application of modern, computer-aided graphics techniques and the use of state-of-the-art, computer-aided design/drafting package(s). Includes topics such as principles of computer-aided design/drafting and interactions with computer-aided manufacturing, rapid prototyping, and other modern manufacturing processes; engineering graphics and graphics languages in computer-aided design and/or drafting; creation of a drawing environment; database and file management, editing, modification, displaying, dimensioning, plotting and printing; special editing techniques; 3-D modeling, solid modeling, shading, and rendering; and file transfer. Students must have Sophomore class standing.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

MEM 202 Statics 3.0 Credits
Covers two-and three-dimensional vector representation of forces, moments and couples; static equilibrium of particles, rigid bodies, and engineering structures; analysis of external and internal forces in structures via methods of free body diagrams; and properties of cross-sectional areas.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHYS 185 [Min Grade: D] or PHYS 101 [Min Grade: D]

MEM 220 Fluid Mechanics I 4.0 Credits
Covers general physical properties of a fluid; kinetics of fluid motion; material derivative, vorticity, strain, and dynamics of fluids; and derivation of conservation laws in control volume form with applications.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (MATH 200 [Min Grade: D] or MATH 189 [Min Grade: D]) and MEM 202 [Min Grade: D] and MEM 310 [Min Grade: D]

MEM 221 Fluid Mechanics II 4.0 Credits
Covers differential analysis of fluid flow, including the Euler's equations, potential flows, and the Navier-Stokes equations; angular momentum and its application to turbomachinery; external flow and boundary layers, and an introduction to compressible flow.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MEM 220 [Min Grade: D]

MEM 230 Mechanics of Materials I 0.0-4.0 Credits
Covers definitions of stress and strain, uniaxial loading, torsion, bending moments and shear forces in beams, bending stresses and shear stress in beams, and stress transformation.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 202 [Min Grade: D]

MEM 238 Dynamics 4.0 Credits
Covers kinematics and kinetics in two and three-dimensional space, force and acceleration, linear and angular momentum, and energy methods.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (MATH 189 [Min Grade: D] or MATH 200 [Min Grade: D]) and MEM 202 [Min Grade: D]

MEM 255 Introduction to Controls 4.0 Credits
Introduces the concepts of modeling of mechanical, electrical, electromechanical, thermal, and hydraulic systems; linearization; state-space model; time-domain analysis; transfer functions; frequency-domain analysis; analysis of systems involving automatic control of position, speed, power, flow, pressure, temperature, and other physical quantities; basic concept of feedback; basic concept of stability; computer-aided analysis.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 238 [Min Grade: D] and (MATH 201 [Min Grade: D] or MATH 261 [Min Grade: D] or ENGR 231 [Min Grade: D]) and (MATH 210 [Min Grade: D] or MATH 262 [Min Grade: D] or ENGR 232 [Min Grade: D])

MEM 304 Introduction to Biomechanical Engineering 3.0 Credits
An overview of the application of mechanical engineering to biological systems. Covers basic anatomy and physiology; tissue, joint, cell, and protein mechanics; joint kinematics; biofluid mechanics; biothermodynamics; biotransport; biomimetic controls; and biomanufacturing.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MATH 200 [Min Grade: D] and PHYS 101 [Min Grade: D] and CHEM 102 [Min Grade: D] and BIO 141 [Min Grade: D]

MEM 310 Thermodynamic Analysis I 4.0 Credits
Covers second law of thermodynamics as applied to closed systems, control volumes, and thermodynamic cycles (Carnot); entropy and isentropic relationships; gas (Otto, Diesel, Stirling, Ericsson, Brayton), vapor (Rankine), and refrigeration cycles.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGR 210 [Min Grade: D] or MEM 210 [Min Grade: D]

MEM 311 Thermal Fluid Science Laboratory 2.0 Credits
Introduces modern laboratory techniques, including statistical analysis of experimental data; thermodynamic properties and equations of state; and dynamic and static temperature measurements with potentiometers, bridge circuits, and oscilloscopes. Fall.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 220 [Min Grade: D] and MEM 310 [Min Grade: D]

MEM 320 Fluid Dynamics I 3.0 Credits
Covers equation of motion for compressible flow; static, total, and stagnation concepts; one-dimensional isentropic, normal shock, including Fanno and Rayleigh flows and choked flow; two-dimensional supersonic flow, including Prandtl-Meyer flow and oblique shocks; analysis and design of compressible flow devices, including supersonic nozzles, diffusers, wind tunnels, inlets, and combustors.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 220 [Min Grade: D]

MEM 330 Mechanics of Materials II 4.0 Credits
Reviews mechanics of materials, beam theory, combined loading, stress transformation, shear center, asymmetrical bending, deflection of beams, statically indeterminate beams, energy methods, inelastic bending, and beam column instability.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 230 [Min Grade: D]

MEM 331 Experimental Mechanics I 0.0-2.0 Credits
Covers static testing methods, including strain gages, extensometers, photoelasticity, and model analysis; practical applications of experimental stress analysis; and verification of standard materials tests, including tensile, shear, and buckling. Winter. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 238 [Min Grade: D] (Can be taken Concurrently)MEM 230 [Min Grade: D]

MEM 333 Mechanical Behavior of Materials 3.0 Credits
Introduces the deformation and failure of engineering materials; Emphasizes application of the fundamentals to engineering design to prevent failure; Covers material damage and failure under multi-axial stresses, yielding, fracture mechanics, fatigue crack growth, fatigue life estimation, and deformation and failure of composite materials.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.
Prerequisites: MEM 230 [Min Grade: D]

MEM 345 Heat Transfer 4.0 Credits
Covers fundamentals of conduction, convection, and radiation; steady and unsteady heat conduction; fundamentals of boundary layer flows; introduction to forced and free convection for external and internal flows; blackbody radiation; and radiation and surface radiation properties.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGR 210 [Min Grade: D] and (MEM 220 [Min Grade: D] or CIVE 320 [Min Grade: D]) and (MATH 210 [Min Grade: D] or MATH 262 [Min Grade: D] or ENGR 232 [Min Grade: D])

MEM 351 Dynamic Systems Laboratory I 0.0-2.0 Credits
Includes experiments involving modeling and simulation of linear and non-linear dynamic systems, including feedback controls. Spring.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 255 [Min Grade: D]

MEM 355 Performance Enhancement of Dynamic Systems 4.0 Credits
This course introduces measures of performance of dynamical systems, means of computing/evaluation-of such measures, and how to design controllers to improve performance.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MEM 255 [Min Grade: D]

MEM 361 Engineering Reliability 3.0 Credits
Reviews probability concepts and modeling of random phenomena, including parameter estimation, empirical determination of distribution models, catastrophic failure models, material strength and fatigue life distribution, and reliability improvement.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: MATH 290 [Min Grade: D] or MATH 201 [Min Grade: D] or MATH 261 [Min Grade: D] or ENGR 231 [Min Grade: D]

MEM 371 Introduction to Nuclear Engineering I 2.0 Credits
Introduces the fundamental scientific, technical, social and ethical issues in nuclear engineering; nuclear reactions and readiation, radiation protection and control, nuclear energy production and utilization, nuclear fuel cycle, nuclear fuel cycle, nuclear materials, controlled fusion and thermonuclear plasma systems, basics of plasma physics and plasma chemistry, nuclear waste management, nuclear reactor safety, analysis of severe nuclear accidents, risk assessment and related issues of engineering ethics.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 201 [Min Grade: D] and (ENGR 210 [Min Grade: D] or CHE 206 [Min Grade: D])

MEM 373 Space Systems Engineering I 3.0 Credits
Introduction to space engineering through presentation of two topics that serve as the foundation of space systems analysis and design: rocket propulsion and orbital mechanics.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MEM 220 [Min Grade: D] and MEM 238 [Min Grade: D] and MEM 310 [Min Grade: D]

MEM 374 Space Systems Engineering II 3.0 Credits
Introduction to design principles and theory of satellite systems engineering, including design theories and parameters involved in satellite development, as well as real life conditions such as applications, product assurance, assembly, and testing.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MEM 373 [Min Grade: D]

MEM 391 Introduction to Engineering Design Methods 1.0 Credit
Introduces the design process, including information retrieval, problem definition, proposal writing, patents, and design notebooks. Includes presentations on problem areas by experts from industry, government, and education. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is EE or major is ETLM or major is MECH.
Cannot enroll if classification is Freshman or Pre-Junior or Sophomore

MEM 395 Hess Undergraduate Scholars Research 0.5-3.0 Credits
A change for undergraduates to experience independent research as part
of the MEM Hess Honors Program. Weekly group meetings to discuss the
details of the research endeavor are coupled with independent student in
a research laboratory. May be repeated five times for credit.
College/Department: College of Engineering
Repeat Status: Can be repeated 5 times for 18 credits
Prerequisites: MEM 310 [Min Grade: D]

MEM 400 Internal Combustion Engines 3.0 Credits
Covers engine types and trends, thermodynamics of engines and engine
processes, ideal and actual engine processes and cycles, combustion
and emissions, fuel chemistry and properties, detonation and knock, and
engine testing and performance.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 310 [Min Grade: D]

MEM 402 Power Plant Design 3.0 Credits
Covers heat cycle arrangement, equipment selection, analysis of cost
demands, and diversity factors. Includes economic studies of plant and
cycle arrangements.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 310 [Min Grade: D]

MEM 403 Gas Turbines & Jet Propulsion 3.0 Credits
Covers fundamentals of thermodynamics and aerothermodynamics, and
application to propulsion engines; thermodynamic cycles and performance
analysis of gas turbines and air-breathing propulsion systems, turbojet,
turboprop, ducted fan, ramjet, and ducted rocket; theory and design
of ramjets, liquid and solid rockets, air-augmented rockets, and hybrid
rockets; aerodynamics of flames, including the thermodynamics and
kinetics of combustion reactions; supersonic combustion technology and
zero-g propulsion problems; and propulsion systems comparison and
evaluation for space missions.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MEM 220 [Min Grade: D] and MEM 310 [Min Grade: D]

MEM 405 Principles of Combustion I 3.0 Credits
Covers thermochemistry, the relationship between heats of formation and
bond energies, heat capacity and heats of reaction, chemical equilibrium,
calculation of flame temperature, and composition of burned gas.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 410 [Min Grade: D]

MEM 406 Principles of Combustion II 3.0 Credits
Covers laminar flame propagation in premixed gases, detonation and
deflagration, burning of liquid and solid fuels, and diffusion flames.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 405 [Min Grade: D]

MEM 410 Thermodynamic Analysis II 3.0 Credits
Covers thermodynamic analysis of ideal and real mixtures and gas phase
reacting systems; Maxwell relations; chemical and phase equilibrium; air-
conditioning; and combustion.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 310 [Min Grade: D]

MEM 413 HVAC Loads 3.0 Credits
Human comfort and associated models; state-of-the-art methods
of calculating building peak heating and cooling loads; analysis of
different psychrometric processes; different types of secondary systems:
description, operating principles, modeling, simulation and sizing of
secondary systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 345 [Min Grade: D] and (MEM 310 [Min Grade: D] or
AE 220 [Min Grade: D])

MEM 414 HVAC Equipment 3.0 Credits
Standard and real, single-stage multistage refrigeration cycles; vapor
compression components (compressor, expansion devices, condensers,
and evaporators); heat pumps; absorption systems; boilers; heat
exchangers; cooling coils, cooling towers; part-load energy performance;
annual energy; annual energy estimation methods (degree-day, bin
method, modified degree-day).
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 345 [Min Grade: D] and (MEM 310 [Min Grade: D] or
AE 220 [Min Grade: D])

MEM 415 Fuel Cell Engines 3.0 Credits
Introduces fundamental aspects and operating principles of fuel cell
systems, including: basic electrochemical principles, thermodynamics
required for understanding the operation, components including functions
and materials, electrochemical performance characteristics, analysis
of system losses and efficiency, various fuel cell types, current state
of technology, application areas/implementation, and current technical
challenges.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (MEM 220 [Min Grade: D] or CHE 302 [Min Grade: D] or
CIVE 320 [Min Grade: D]) and MEM 310 [Min Grade: D]

MEM 417 Introduction to Microfabrication 3.0 Credits
This course focuses on the fundamentals of microfabrication
technologies. The materials, principles, and applications of silicon-
based microfabrication technologies such as photolithography, wet/dry
etching, deposition techniques, surface micromachining, and polymer
micromachining are covered. This course also includes two lab sessions
through which students have hands-on experiences in microfabrication.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

MEM 419 Microfluidics and Lab-on-a-Chip 3.0 Credits
This course focuses on design, manufacturing, and application of lab-on-a-chip systems as well as understanding microfluidic phenomena. The lecture covers novel microfluidic phenomena, microsensors, microactuators, and case studies. This course also includes two lab sessions through which student have hands-on experiences in lab-on-a-chip technology.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: MEM 417 [Min Grade: D]

MEM 420 Aerodynamics 3.0 Credits
Covers steady and unsteady flow, flow around a body, wing theory, thin airfoil theory, fundamental equation of finite-wing theory, and aerodynamic characteristics of wings. Introduces potential theory and boundary layer phenomena.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 220 [Min Grade: D]

MEM 423 Mechanics of Vibration 4.0 Credits
Covers free and forced vibrations of one-, two-, and multiple-degree-of-freedom systems; continuous systems; and transient and random vibration problems. Includes use of digital computer for homework and special class problems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 238 [Min Grade: D] and (TDEC 222 [Min Grade: D] or ENGR 232 [Min Grade: D] or MATH 210 [Min Grade: D] or MATH 262 [Min Grade: D])

MEM 424 Biomechanics 3.0 Credits
Introduces modeling of dynamics of biomechanical systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 202 [Min Grade: D] and MEM 238 [Min Grade: D]

MEM 425 Aircraft Design & Performance 3.0 Credits
Introduces aerodynamics and airfoils; steady flight; power required and power available curves; range and endurance; takeoff, glide, and landing; stick force and control-free stability; moment coefficients and derivatives; and designing to specification. Students must have Junior class standing.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

MEM 426 Aerospace Structures 3.0 Credits
Covers properties of wing and fuselage sections, torsion of thin-walled and skin-stringer multiple-cell sections, non-symmetrical bending of wing and fuselage sections, shear in thin-walled and skin-stringer sections, and buckling. Introduces matrix methods.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 230 [Min Grade: D]

MEM 427 Finite Element Methods 3.0 Credits
Introduces the fundamental theory and formulations of finite element method and its application in structural mechanics and thermal/fluid science. Topics include formulation of 1-D and 2-D elements, isoparametric elements, static and dynamic analysis of trusses, beams, and frames, 2-D plane problems, and heat transfer problems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MEM 230 [Min Grade: D]

MEM 428 Introduction to Composites I 3.0 Credits
Introduces anisotropic elasticity, lamina stiffness and compliance, plane stress and strain, test methods, and failure criteria.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 330 [Min Grade: D]

MEM 429 Introduction to Composites II 3.0 Credits
Covers laminated plate theory, stiffness and compliance of laminated plates, effect of laminated configuration on elastic performance, and strength production.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 428 [Min Grade: D]

MEM 430 Advanced Stress Analysis 4.0 Credits
Examines three-dimensional representation of stress and strain, coordinate transformation, stress strain relationships for anisotropic and isotropic materials, equilibrium equations, boundary value problems, governing equations in plane strain and plane stress problems, Airy's stress function, two-dimensional problems in polar coordinates, and selected applications to stress analysis problems in mechanical engineering.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 330 [Min Grade: D]

MEM 431 Machine Design I 3.0 Credits
Covers static strength and fatigue theories of failure, fasteners, welded joints, springs, roller bearings, and lubricated spur gears.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Junior or Pre-Junior or Sophomore
Prerequisites: MEM 202 [Min Grade: D] and MEM 230 [Min Grade: D] and MEM 238 [Min Grade: D]

MEM 435 Introduction to Computer-Aided Design and Manufacturing 0.0-4.0 Credits
Covers fundamental use of CAD/CAM systems for geometry definition, finite element applications, and introductory computer graphics concepts.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: MEM 201 [Min Grade: D]

MEM 436 Introduction to Computer-Aided Manufacturing 3.0 Credits
Examination of the basic elements that are used to integrate the design and manufacturing processes. Robotics computerized-numerical controlled machine, and CAD/CAM systems. Manufacturability considerations when integrating unit process elements.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 201 [Min Grade: D] and MEM 435 [Min Grade: D]

MEM 437 Manufacturing Process I 3.0 Credits
Examines the basic elements used to integrate the design and manufacturing processes; robotics, computerized-numerical-controlled machines, and CAD/CAM systems; and manufacturability considerations when integrating unit process elements.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 220 [Min Grade: D] and MEM 230 [Min Grade: D]

MEM 438 Manufacturing Process II 3.0 Credits
Covers plastics and reinforced plastics processes, theory of polymer and plastic process, simple models of polymer flows, and manufacturability of plastics.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 437 [Min Grade: D]

MEM 440 Thermal Systems Design 3.0 Credits
This course covers fundamentals of thermal system design; the role of design in engineering practice; economic analysis used for design of thermal systems; advanced concepts and analysis of heat exchangers and distillation equipment; modeling of thermal systems; simulation of thermal systems; fundamentals of optimization and design of optimized thermal systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 345 [Min Grade: D]

MEM 444 Biofluid Mechanics 3.0 Credits
This course introduces flow-related anatomy and pathophysiology, and biomedical flow devices and their design challenges. Analysis methods to solve biological fluid mechanics design problems are introduced and several interdisciplinary team projects are assigned to apply fluid mechanics to practical biological or medical problems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MEM 220 [Min Grade: D] or BMES 451 [Min Grade: D]

MEM 445 Solar Energy Fundamentals 3.0 Credits
This course focuses on basic theories of solar radiation, solar thermal energy, and photovoltaics. Students will learn basic radiation heat transfer, solar radiation, solar thermal collection and storage, passive and active solar heating/cooling, physics of photovoltaic cells, and characteristics and types of solar cells.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MEM 345 [Min Grade: C] and PHYS 201 [Min Grade: C]

MEM 446 Fundamentals of Plasmas I 3.0 Credits
Introduces the fundamentals of plasma science and modern industrial plasma applications in electronics, fuel conversion, environmental control, chemistry, biology, and medicine. Topics include quasi-equilibrium and non-equilibrium thermodynamics, statistics, fluid dynamics and kinetics of plasma and other modern high temperature and high energy systems and processes.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 201 [Min Grade: D] or TDEC 201 [Min Grade: D] or PHYS 112 [Min Grade: D] or PHYS 187 [Min Grade: D]

MEM 447 Fundamentals of Plasmas II 3.0 Credits
Continues the development of the engineering fundamentals of plasma discharges applied in modern industrial plasma applications in electronics, fuel conversion, environmental control, chemistry, biology, and medicine. Topics include quasi-equilibrium and non-equilibrium thermodynamics, statistics, fluid dynamics of major thermal and non-thermal plasma discharges, operating at low, moderate and atmospheric pressures.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MEM 446 [Min Grade: D]

MEM 448 Applications of Thermal Plasmas 3.0 Credits
Introduces applications of modern thermal plasma processes focused on synthesis of new materials, material treatment, fuel conversion, environmental control, chemistry, biology, and medicine. Topics Include thermodynamics and fluid dynamics of high temperature plasma processes, engineering organization of specific modern thermal plasma technologies.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 201 [Min Grade: D] or TDEC 201 [Min Grade: D] or PHYS 112 [Min Grade: D] or PHYS 187 [Min Grade: D]

MEM 449 Applications of Non-Thermal Plasmas 3.0 Credits
Application of modern non-thermal plasma processes focused on synthesis of new materials, material treatment, fuel conversion, environmental control, chemistry, biology, and medicine. Topics Include non-equilibrium thermodynamics and fluid dynamics of cold temperature plasma processes, engineering organization of specific modern non-thermal plasma technologies.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 201 [Min Grade: D] or TDEC 201 [Min Grade: D] or PHYS 112 [Min Grade: D] or PHYS 187 [Min Grade: D]

MEM 451 Orbital Mechanics 3.0 Credits
Introduces two-body problems, satellite orbits, their characterization and determination; transfer maneuvers between orbits; path planning for inter-planetary travels.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MEM 238 [Min Grade: D]

MEM 453 Aircraft Flight Dynamics & Control I 3.0 Credits
Covers general equations of motion for aircraft; linearization based on small disturbance theory and modal analysis to identify longitudinal open-loop characteristics; review of classical control theory; state space analysis; and autopilot design, including classical, pole placement, and optimal.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 355 [Min Grade: D]

MEM 454 Aircarft Flight Dynamics & Control II 3.0 Credits
Covers observers; lateral dynamics; Dutch roll, roll convergence, and spiral modes; autopilot design and evaluations; and inertial cross-coupling computer simulation and analysis.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 453 [Min Grade: D]

MEM 455 Introduction to Robotics 0.0-4.0 Credits
Introduces basic concepts in robot operation and structure, including actuators, sensors, mechanical components, robot control and robot programming.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 238 [Min Grade: D] and MEM 255 [Min Grade: D]

MEM 456 Robotics II 3.0 Credits
Covers homogeneous kinematics of robots; velocities and accelerations; and static forces in manipulators, including iterative Newton-Euler formulation of manipulator dynamics.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 455 [Min Grade: D]

MEM 457 Robotics III 3.0 Credits
Covers robotic-based automated manufacturing, including robot work cell configurations, applications of robots in manufacturing, material transfer, assembly, and inspection.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: MEM 456 [Min Grade: D]

MEM 458 Micro-Based Control Systems I 0.0-3.0 Credits
Provides hands-on experience in real-time control and manipulation of hardware dynamic systems, including microcomputer, architecture, software, and device drivers. Emphasizes real-time interfacing of data acquisition and control systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 355 [Min Grade: D]

MEM 459 Control Applications of DSP Microprocessors 3.0 Credits
Continues MEM 458. Provides real-time control and manipulation of hardware dynamic systems. Emphasizes real-time interfacing of data acquisition and control systems. Topics include Code Composer Studio, Microprocessor C programming, Pulse width modulation (PWM), Quadrature encoder pulse (QEP) circuits, DSP system control and interrupts, Digital loop systems, design of PID digital controllers, design of digital controllers in state space, microcomputer controller implementation, sensors and actuators, and implementation of digital controllers in microprocessors.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MEM 458 [Min Grade: D]

MEM 462 [WI] Introduction to Engineering Management 3.0 Credits
Introduces the general theory of management, including the processes of planning, organizing, assembling resources, supervising, and controlling. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.

MEM 475 Medical Robotics I 3.0 Credits
Use of robots in surgery, safety considerations, understanding robot kinematics, analysis of surgeon performance using a robotic devices, inverse kinematics, velocity analysis, acceleration analysis, various types of surgeries case study.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MEM 238 [Min Grade: D]

MEM 476 Medical Robotics II 3.0 Credits
Force and movement for robot arms, robot dynamics, computer vision, vision based control, combining haptics, vision and robot dynamics in a cohesive framework for the development of a medical robotic system.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MEM 475 [Min Grade: D]

MEM 477 Haptics for Medical Robotics 3.0 Credits
Introduction to haptics, physiology of touch, actuators, sensors, non-portable force feedback, portable voice feedback, tactile feedback interfaces, haptic sensing and control.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MEM 238 [Min Grade: D]

MEM 478 Computer-Aided Tissue Engr 3.0 Credits
Introduction to the engineering aspects of tissue reengineering and integrated CAD/CAE/CAM technology applied to tissue engineering with hands-on experience combing CAD, medical image processing, 3-D reconstruction software, and solid freeform fabrication of tissue scaffolding.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.

MEM 491 [WI] Senior Design Project I 2.0 Credits
Introduces the design process, including information retrieval, problem definition, proposal writing, patents, and design notebooks. Includes presentations on problem areas by experts from industry, government, and education. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: MEM 311 [Min Grade: D] and MEM 331 [Min Grade: D] and MEM 351 [Min Grade: D] and MEM 435 [Min Grade: D] and (MEM 391 [Min Grade: D] or ECE 391 [Min Grade: D])

MEM 492 [WI] Senior Design Project II 0.0-3.0 Credits
Continues MEM 491. Requires written and oral progress reports. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: MEM 491 [Min Grade: D]

MEM 493 [WI] Senior Design Project III 0.0-3.0 Credits
Continues MEM 492. Requires written and oral final reports, including oral presentations by each design team at a formal Design Conference open to the public and conducted in the style of a professional conference. This is a writing intensive course.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: MEM 492 [Min Grade: D]

MEM I199 Independent Study in MEM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MEM I299 Independent Study in MEM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MEM I399 Independent Study in MEM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

MEM I499 Independent Study in MEM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MEM T180 Special Topics in MEM 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MEM T280 Special Topics in MEM 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MEM T380 Special Topics in MEM 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MEM T480 Special Topics in MEM 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

Mechanical Engineering Technology

Courses

MHT 201 Kinematics 3.0 Credits
Study of four-bar linkages, sliders, and other devices using orthogonal of vectors, instantaneous centers, equivalent linkages, and effective cranks. Graphic solutions are emphasized, including an introduction to computer software.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: PHYS 103 [Min Grade: D]

MHT 205 Thermodynamics I 3.0 Credits
Students are introduced to the general theory of heat and matter; laws of thermodynamics; energy-transformation principles and availability of energy; and properties and processes for substances and ideal gases.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (PHYS 103 [Min Grade: D] or PHYS 101 [Min Grade: D] or PHYS 153 [Min Grade: D]) and MATH 122 [Min Grade: D]

MHT 206 Thermodynamics II 3.0 Credits
First and second law analysis of power cycle components. Analysis of gas power cycles, including Otto & Diesel engines and Brayton cycle turbines. Analysis of traditional power plant cycles, including Rankine, Refrigeration and heat pump.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MHT 205 [Min Grade: D]

MHT 214 Technology Laboratory I 3.0 Credits
Conduct experiments to determine the physical properties of incompressible fluids and to measure the flow rates of velocities utilizing pilot tubes, office plates, Venturi and Weirs flow meter, U-tube differential manometers and piezometers. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: MHT 301 [Min Grade: D] (Can be taken Concurrently)

MHT 220 Applied Statics 3.0 Credits
Explores forces, moments, couples, statistics of particles, and rigid bodies in two and three dimensions. Examines external and internal distributed forces, first moments and centroids, and structures such as trusses, frames and machines.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 282 [Min Grade: D] and MATH 122 [Min Grade: D]

MHT 222 Applied Dynamics I 4.0 Credits
This course deals with the motion of bodies under the action of a single or multiple forces. It covers kinematics and kinetics of particles in rectilinear and curvilinear motions using various coordinate systems, work and energy, impulse and momentum, planar kinematics using analytical and graphical methods. Kinetics of rigid bodies using force and acceleration, work and energy, and impulse and momentum principles.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: (PHYS 103 [Min Grade: D] or PHYS 101 [Min Grade: D]) and MATH 122 [Min Grade: D]

MHT 224 Applied Dynamics II 3.0 Credits
Impulse and momentum of particles; kinematics and dynamics of rigid bodies-force-mass and acceleration; dynamics of rigid bodies - work and energy. Impulse and momentum; introduction to mechanical vibration.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MHT 222 [Min Grade: D]

MHT 226 Measurement Techniques and Instrumentation 3.0 Credits
The course focuses on basic concepts of measurement and measurement systems and techniques, causes of errors and error propagation; uncertainty analysis, data collection and analysis using statistical methods, data acquisition systems; Knowledge delivery is based on integrated experiential learning modules involving various measurement sensors and instruments.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 104 [Min Grade: D] and STAT 201 [Min Grade: D] and EET 209 [Min Grade: D]

MHT 295 Environmental Control Plasma Laboratory 2.0 Credits
The course presents engineering principles of non-thermal plasma application to air cleaning from Volatile Organic Compounds by combining hands-on laboratory experience with lectures. The students learn the engineering and physical principles of non-equilibrium plasma systems using the unique pulsed corona system of the Drexel Plasma Institute Environmental Laboratory.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 111 [Min Grade: D] and CHEM 113 [Min Grade: D]

MHT 301 Fluid Mechanics I 3.0 Credits
Examine hydrostatics; principles governing fluids at rest; pressure measurement; hydrostatic forces on submerged areas and objects; simple dams. Discuss fluid flow in pipes under pressure; fluid energy; power and friction loss; Bernoulli's theorem. Flow measurement.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MHT 205 [Min Grade: D] and MET 213 [Min Grade: D] and MET 209 [Min Grade: D]

MHT 310 Applied Strength of Materials I 3.0 Credits
Topics include axially loaded members, stress and strain, allowable stresses, factor of safety, temperature effects, indeterminate members, torsional stresses and deformation. Students also examine shear moment beams; and flexural and transverse shearing stresses in beams.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MHT 222 [Min Grade: D]

MHT 312 Applied Strength of Materials II 3.0 Credits
A study of determinate and indeterminate bean deflections and reactions by superposition, integration and moment area methods. Topics include combined stresses; principal stresses; Mohr's circle; and theories of failure.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MHT 310 [Min Grade: D]

MHT 314 Thermo and Heat Transfer Analysis 3.0 Credits
Explores basic thermodynamic and heat transfer concepts and relations including fundamental of conduction, convection, and radiation using modern experiential methods to analyze thermodynamics systems and the related heat transfer mechanisms.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MHT 205 [Min Grade: D]

MHT 316 Fluid Mechanics Laboratory 3.0 Credits
Conduct experiments to determine the physical properties of incompressible fluids and to measure the flow rate of velocities as the fluid flows through open channels, partially filled conduits, conduits under pressure, pipe networks, and turbines and pumps.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MHT 301 [Min Grade: D]

MHT 401 Mechanical Design I 4.0 Credits
An introduction to mechanical design, the design process, design factors, creativity, optimization, human factors, and value engineering. Topics include simple design, properties and selection of materials; stress concentrations; strength under combined stresses; theories of failure; impact; and fluctuating and repeated loads.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MET 100 [Min Grade: D] and MET 213 [Min Grade: D]

MHT 402 Mechanical Design II 4.0 Credits
Topics include deformation and design of belt drives, chair drives, detachable fasteners and bearings, lubrication, and journal bearings. Covers stresses and power transmission of spur, bevel, and worm gear, shaft design, and clutches and brakes.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MHT 401 [Min Grade: D]

MHT 403 Fluid Mechanics II 3.0 Credits
Consider pipe networks and reservoir systems, flow in open channels and uniform flow energy, friction loss, minor losses, velocity distribution, alternate stages of flow, critical flow, non-uniform flow, accelerated, retarded flow and hydraulic jump.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: MHT 301 [Min Grade: D]

MHT 404 Advanced Materials 3.0 Credits
Lectures on inorganic materials, i.e., polymers, glasses, ceramics, concrete, wood, and materials having important electrical and magnetic properties; also a summary of the most up-to-date applications for the fabrication and uses of both metals and nonmetals.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: MET 101 [Min Grade: D]

MHT 405 HVAC 3.0 Credits
Heating, Ventilation, and Air Conditioning (HVAC) focuses on air conditioning principles, including psychometrics and heat pumps. Examines calculation of heating and cooling loads in accordance with ASHRAE practices, principles of gas compression, analysis of vapor compression; refrigeration systems, low temperature refrigeration cycles, and absorption refrigeration systems.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: MHT 206 [Min Grade: D]

MHT T180 Special Topics in MHT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MHT T280 Special Topics in MHT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MHT T380 Special Topics in MHT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

MHT T480 Special Topics in MHT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

Medical Billing & Coding

Courses

MBC 101 Medical Terminology for Billers and Coders 3.0 Credits
This course covers medical terminology and anatomy from a biller's and coder's perspective and provides a foundation for courses in medical billing and coding.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

MBC 201 Medical Billing I 3.0 Credits
Designed as part one of a two-part sequence, this course is intended for those who have no experience or minimal experience with medical billing. The student will learn principles of medical billing related to proper claim form preparation, submission, and payment processing.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

MBC 202 Medical Billing II 3.0 Credits
Designed as part two of a two part sequence, this course is intended for those who have completed MBC 201 and who are seeking further knowledge of medical billing. The completion of MBC 201 and MBC 202 prepares the student to sit for AAPC's CPB certification exam.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: MBC 201 [Min Grade: D]

MBC 250 Medical Billing Software 3.0 Credits
This course walks through Medical Billing Software applications and applies practical application of medical office functions such as charge entry, payment posting, report design, and generation. Students will be exposed to the technical side of medical office functions.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: MBC 201 [Min Grade: D] (Can be taken Concurrently)

MBC 301 Physician-Based Medical Coding I 3.0 Credits
Part one of a two-part program. The student will learn principles of medical coding related to three main code books: CPT®, ICD-10-CM, and HCPCS II.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: MBC 201 [Min Grade: D]

MBC 302 Physician-Based Medical Coding II 3.0 Credits
Designed as part two of a two-part sequence, this course continues instruction in the principles of medical coding related to CPT®, ICD-10-CM and HCPS Level II code books as well as preparing the students to sit for nationally recognized certificate exams.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: MBC 301 [Min Grade: D]

MBC 303 Hospital-Based Medical Coding I 3.0 Credits
Designed as part one of a two-part sequence, this course teaches the principles of hospital-based medical coding related to the coding for in-patient hospital cases by means of ICD-10-CM and ICD-10-PCS code books, as well as helping to prepare the student to sit for AAPC's CIC and COC certification exams.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: MBC 301 [Min Grade: D]

MBC 304 Hospital-Based Medical Coding II 3.0 Credits
Designed as part two of a two-part sequence, this course continues instruction in the principles of hospital-based medical coding related to the coding for in-patient and out-patient hospital cases by means of the ICD-10-CM and ICD-10-PCS code books, as well as helping to prepare for AAPC's CIC and COC certification exams.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: MBC 303 [Min Grade: D]

MBC 350 Physician-Based Chart Auditing 3.0 Credits
The student will learn principles of medical auditing. In addition, there will be discussion of key areas of regulations, CIAs, medical record documentation, and chart abstraction. This course is recommended for anyone who is preparing for a career in medical auditing and strongly recommended for anyone who is preparing for the AAPC CPMA certification examination.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: MBC 302 [Min Grade: D] (Can be taken Concurrently)

MBC 360 Hospital-Based Case Studies 3.0 Credits
This course takes the student through the business side of facilities and helps the student understand completion of the UB-04 claim form, facility reimbursement, and incorporates applying the use of ICD-10-CM, ICD-10-PCS, and CPT coding in both inpatient and outpatient facility coding.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: MBC 304 [Min Grade: D] (Can be taken Concurrently)

Middle East and North Africa Studies

Courses

MENA 101 The Middle East and North Africa Today: Culture and Democracy 3.0 Credits
During the last decades, Middle East and North Africa (MENA) has been in the grips of momentous socio-political conflicts and wars, but most recently, the region has witnessed wide spread uprisings for democratic change. Yet, authoritarianism still dominates politics in the region. This course aims to examine the economic, political, and cultural causes behind the lack of democracy in the region, and will expose students to contrasting perspectives on the topic including structural and cultural arguments. Amongst other examples, we will examine the role of the US, the impact of the Israeli/Palestinian conflict on democracy in the region, and the role of Islamic and women's movements in the recent Arab uprisings. The course will cover Tunisia, Egypt, Syria, Morocco, Saudi Arabia, Iraq, and Iran among others.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

Military Science

Courses

MLSC 101 Basic Leadership Lab/Practicum 0.0 Credits
Provides hands-on experience to reinforce leadership fundamentals, while emphasizing increased awareness of and proficiency in military skills.
College/Department: University Courses
Repeat Status: Not repeatable for credit

MLSC 102 Basic Leadership Lab/Practicum 0.0 Credits
Provides hands-on experience to reinforce leadership fundamentals, while emphasizing increased awareness of and proficiency in military skills.
College/Department: University Courses
Repeat Status: Not repeatable for credit

MLSC 103 Basic Leadership Lab/Practicum 0.0 Credits
Provides hands-on experience to reinforce leadership fundamentals, while emphasizing increased awareness of and proficiency in military skills.
College/Department: University Courses
Repeat Status: Not repeatable for credit

MLSC 110 Leadership and Personal Developmnt 1.0 Credit
Introduces students/cadets to the personal challenges and competencies that are critical for effective leadership. Focus is placed on developing basic knowledge and comprehension of the U.S. Army's Leadership Dimensions while gaining a "big picture" understanding of the Army ROTC program, its purpose in the U.S. Army and our nation, and its advantages for the student. Classes are conducted for one hour once each week.
College/Department: University Courses
Repeat Status: Not repeatable for credit

MLSC 120 Foundations in Leadership 1.0 Credit
Reviews leadership fundamentals such as setting direction, problem solving, listening, presenting briefs, providing feedback and using effective writing skills. Students/cadets are also exposed to key fundamentals of skills required to be successful as an MS II cadet; namely, military map reading and land navigation, and small unit operations/leadership drills.
College/Department: University Courses
Repeat Status: Not repeatable for credit

MLSC 130 Continuing Studies: Foundations in Leadership 1.0 Credit
Continues to develop leadership fundamentals, while emphasizing increased awareness of and proficiency in military map reading and land navigation skills, and small unit operations/ leadership drills.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Prerequisites: MLSC 110 [Min Grade: B] or MLSC 120 [Min Grade: B]

MLSC 201 Basic Leadership Lab/Practicum 0.0 Credits
Provides hands-on experience to reinforce leadership fundamentals, while emphasizing increased awareness of and proficiency in military skills.
College/Department: University Courses
Repeat Status: Not repeatable for credit

MLSC 202 Basic Leadership Lab/Practicum 0.0 Credits
Provides hands-on experience to reinforce leadership fundamentals, while emphasizing increased awareness of and proficiency in military skills.
College/Department: University Courses
Repeat Status: Not repeatable for credit

MLSC 203 Basic Leadership Lab/Practicum 0.0 Credits
Provides hands-on experience to reinforce leadership fundamentals, while emphasizing increased awareness of and proficiency in military skills.
College/Department: University Courses
Repeat Status: Not repeatable for credit

MLSC 210 Innovative Tactical Leadership 2.0 Credits
Explores the dimensions of creative and innovative tactical leadership strategies and styles by studying historical case studies and engaging in interactive student exercises. Focus is on continued development of the knowledge of leadership values and attributes through an understanding of rank, uniform, customs and courtesies.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (MLSC 110 [Min Grade: B] or MLSC 120 [Min Grade: B]) and MLSC 130 [Min Grade: B]

MLSC 220 Leadership in Changing Environments 2.0 Credits
Examines the challenges of leading in complex contemporary operational environments. Students/cadets are exposed to more complex land navigation/map reading tasks, as well as more advanced small unit operations/ leadership drills. Cadets develop greater self awareness as they practice communication and team building skills.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (MLSC 110 [Min Grade: B] or MLSC 120 [Min Grade: B]) and MLSC 130 [Min Grade: B] and MLSC 210 [Min Grade: B]

MLSC 230 Adaptive Team Leadership 2.0 Credits
Challenges cadets to study, practice, and evaluate adaptive leadership. Cadets begin to analyze and evaluate their own leadership values, attributes, skills, and actions. Primary attention is given to preparation for LDAC and the development of both tactical skills and leadership qualities.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Prerequisites: (MLSC 110 [Min Grade: B] or MLSC 120 [Min Grade: B]) and MLSC 130 [Min Grade: B] and MLSC 210 [Min Grade: B] and MLSC 220 [Min Grade: B]

MLSC 301 Leadership Lab/Practicum 0.0 Credits
Provides hands-on experience to reinforce leadership fundamentals, while emphasizing increased awareness of and proficiency in military skills.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Prerequisites: (MLSC 110 [Min Grade: B] or MLSC 120 [Min Grade: B]) and MLSC 130 [Min Grade: B] and MLSC 210 [Min Grade: B] and MLSC 220 [Min Grade: B] and MLSC 230 [Min Grade: B]

MLSC 302 Leadership Lab/Practicum 0.0 Credits
Provides hands-on experience to reinforce leadership fundamentals, while emphasizing increased awareness of and proficiency in military skills.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Prerequisites: (MLSC 110 [Min Grade: B] or MLSC 120 [Min Grade: B]) and MLSC 130 [Min Grade: B] and MLSC 210 [Min Grade: B] and MLSC 220 [Min Grade: B] and MLSC 230 [Min Grade: B] and MLSC 310 [Min Grade: B]

MLSC 303 Leadership Lab/Practicum 0.0 Credits
Provides hands-on experience to reinforce leadership fundamentals, while emphasizing increased awareness of and proficiency in military skills.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Prerequisites: (MLSC 110 [Min Grade: B] or MLSC 120 [Min Grade: B]) and MLSC 130 [Min Grade: B] and MLSC 210 [Min Grade: B] and MLSC 220 [Min Grade: B] and MLSC 230 [Min Grade: B] and MLSC 310 [Min Grade: B] and MLSC 320 [Min Grade: B]

MLSC 310 Leadership in Contact 2.0 Credits
Uses increasingly intense situational leadership challenges to build cadet awareness and skills in leading small units. Skills in decision-making, persuading, and motivating team members when "in combat" are explored, evaluated, and developed.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (MLSC 110 [Min Grade: B] or MLSC 120 [Min Grade: B]) and MLSC 130 [Min Grade: B] and MLSC 210 [Min Grade: B] and MLSC 220 [Min Grade: B] and MLSC 230 [Min Grade: B]

MLSC 320 Complex Team Leadership Issues 2.0 Credits
Challenges cadets with more complex leadership issues to further
develop, practice, and evaluate adaptive leadership. Cadets continue to
analyze and evaluate their own leadership values, attributes, skills, and
actions in preparation for the Leadership Development and Assessment
Course (LDAC). Primary attention is given to preparation for LDAC and
the development of both tactical skills and leadership qualities.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (MLSC 110 [Min Grade: B] or MLSC 120 [Min Grade: B])
and MLSC 130 [Min Grade: B] and MLSC 210 [Min Grade: B] and MLSC
220 [Min Grade: B] and MLSC 230 [Min Grade: B] and MLSC 310 [Min
Grade: B]

MLSC 330 Military Leadership Co-op Preparation 2.0 Credits
Continues the methodology of MLSC 320 by using increasingly intense
situational leadership challenges to build cadet awareness and skills in
leading small units. Skills in decision-making, persuading, and motivating
team members when "in combat" are explored, evaluated, and developed.
Emphasis is also placed on honing oral and written communication skills
and mastering group dynamics while conducting tactical and Garrison
operation orders.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Prerequisites: (MLSC 110 [Min Grade: B] or MLSC 120 [Min Grade: B])
and MLSC 130 [Min Grade: B] and MLSC 210 [Min Grade: B] and MLSC
220 [Min Grade: B] and MLSC 230 [Min Grade: B] and MLSC 310 [Min
Grade: B] and MLSC 320 [Min Grade: B]

MLSC 390 Special Topics in Military Science 0.5-12.0 Credits
Special Topics of interest in Military Science. May be repeated for credit.
College/Department: University Courses
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

MLSC 401 Leadership Lab/Practicum 0.0 Credits
Provides hands-on experience to reinforce leadership fundamentals, while
emphasizing increased awareness of and proficiency in military skills.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Prerequisites: (MLSC 110 [Min Grade: B] or MLSC 120 [Min Grade: B])
and MLSC 130 [Min Grade: B] and MLSC 210 [Min Grade: B] and MLSC
220 [Min Grade: B] and MLSC 230 [Min Grade: B] and MLSC 310 [Min
Grade: B] and MLSC 320 [Min Grade: B] and MLSC 330 [Min Grade: B]

MLSC 402 Leadership Lab/Practicum 0.0 Credits
Provides hands-on experience to reinforce leadership fundamentals, while
emphasizing increased awareness of and proficiency in military skills.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Prerequisites: (MLSC 110 [Min Grade: B] or MLSC 120 [Min Grade: B])
and MLSC 130 [Min Grade: B] and MLSC 210 [Min Grade: B] and MLSC
220 [Min Grade: B] and MLSC 230 [Min Grade: B] and MLSC 310 [Min
Grade: B] and MLSC 320 [Min Grade: B] and MLSC 330 [Min Grade: B]
and MLSC 410 [Min Grade: B]

MLSC 403 Leadership Lab/Practicum 0.0 Credits
Provides hands-on experience to reinforce leadership fundamentals, while
emphasizing increased awareness of and proficiency in military skills.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Prerequisites: (MLSC 110 [Min Grade: B] or MLSC 120 [Min Grade: B])
and MLSC 130 [Min Grade: B] and MLSC 210 [Min Grade: B] and MLSC
220 [Min Grade: B] and MLSC 230 [Min Grade: B] and MLSC 310 [Min
Grade: B] and MLSC 320 [Min Grade: B] and MLSC 330 [Min Grade: B]
and MLSC 410 [Min Grade: B] and MLSC 420 [Min Grade: B]

MLSC 410 Developing Adaptive Leaders 2.0 Credits
Develops cadet proficiency in planning, executing, and assessing complex
operations, functioning as a member of a staff, and providing leadership
performance feedback to subordinates. Cadets are given situational
opportunities to assess risk, make ethical decisions, and provide coaching
to fellow ROTC cadets.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (MLSC 110 [Min Grade: B] or MLSC 120 [Min Grade: B])
and MLSC 130 [Min Grade: B] and MLSC 210 [Min Grade: B] and MLSC
220 [Min Grade: B] and MLSC 230 [Min Grade: B] and MLSC 310 [Min
Grade: B] and MLSC 320 [Min Grade: B] and MLSC 330 [Min Grade: B]

MLSC 420 Leadership in Contemporary Environments 2.0 Credits
Explores the dynamics of leading in the complex situations of current
military operations. Cadets examine differences in customs and
courtesies, military law, principles of war, and rules of engagement in the
face of international terrorism. Aspects of interacting with non-government
organizations, civilians on the battlefield, and host nation support are
examined and evaluated.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (MLSC 110 [Min Grade: B] or MLSC 120 [Min Grade: B])
and MLSC 130 [Min Grade: B] and MLSC 210 [Min Grade: B] and MLSC
220 [Min Grade: B] and MLSC 230 [Min Grade: B] and MLSC 310 [Min
Grade: B] and MLSC 320 [Min Grade: B] and MLSC 330 [Min Grade: B]
and MLSC 410 [Min Grade: B]

**MLSC 430 Advanced Leadership in Contemporary Environments 2.0
Credits**
Continues exploration of the dynamics of leading in the complex situations
of current military operations. Culminates the ROTC curriculum with
a capstone "hands-on" small unit leadership exercise which tests the
cadet's tactical, technical and leadership skills utilizing an intense, realistic
tactical scenario based on actual military operations in the contemporary
operating environment of the 21st century.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (MLSC 110 [Min Grade: B] or MLSC 120 [Min Grade: B])
and MLSC 130 [Min Grade: B] and MLSC 210 [Min Grade: B] and MLSC
220 [Min Grade: B] and MLSC 230 [Min Grade: B] and MLSC 310 [Min
Grade: B] and MLSC 320 [Min Grade: B] and MLSC 330 [Min Grade: B]
and MLSC 410 [Min Grade: B] and MLSC 420 [Min Grade: B]

Music

Courses

MUSC 101 University Chorus 1.0 Credit
A large chorus that studies and performs music of many styles; performs each term. May be repeated for credit.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC 102 Chamber Singers 1.0 Credit
A select choir that performs advanced choral repertoire; performs frequently on and off campus. May be repeated for credit.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC 103 Naturally Sharp (Vocal Jazz Ensemble) 0-1 Credits
Naturally Sharp is a select group of singers, chosen by audition in the fall from the University Chorus. Naturally Sharp performs vocal jazz repertoire from the past hundred years with a three-piece backup band. Singers must also be able to do solos.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Corequisite: MUSC 101

MUSC 104 All-College Choir 0-1 Credits
All-College Choir is a non-auditioned, mixed voice ensemble that performs repertoire of various styles, genres and eras - including music of the classical tradition, jazz, spirituals, American musical theater, folk and pop.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC 105 Concert Band 1.0 Credit
Performs a wide variety of music written for a large band; concerts given each term. May be repeated for credit.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC 106 Guitar Ensembles 1.0 Credit
Performs a wide variety of music written for a small guitar ensemble; concerts given at least twice a year. May be repeated for credit.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC 107 Jazz Ensembles 1.0 Credit
Offers rehearsal, study, and performance of jazz compositions for both large and small ensembles; concerts given on and off campus, sometimes with guest soloists. May be repeated for credit.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC 108 Jazztet 0-1 Credits
Jazztet is a subset of the larger Jazz Orchestra. Its size can vary based upon the availability of instrumentation and the desire of the director. Its purpose is to present jazz music in a small instrumentation format. Performances are typically part of the greater Jazz Orchestra concerts at the end of each term.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Corequisite: MUSC 107

MUSC 109 University Orchestra 1.0 Credit
This is a full orchestra that performs concert repertoire of various periods from the 18th century to the present day. Wind, brass, and percussionists must be in the concert band in order to participate.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC 110 Keyboard Ensembles 1.0 Credit
Performs a wide variety of music written for a small keyboard ensemble; concerts given at least twice a year. May be repeated for credit.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC 111 Chamber Music Ensemble 1.0 Credit
Various small ensembles performing a variety of music of many periods and styles. May be repeated for credit.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC 112 Fusion Band 1.0 Credit
Performs a wide variety of music written for a small fusion ensemble. The Fusion Band gives concerts at least twice a year. May be repeated for credit.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC 113 Percussion Ensembles 1.0 Credit
Performs a wide variety of music written for a small percussion ensemble. The ensemble gives concerts at least twice a year. May be repeated for credit.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC 114 Mediterranean Ensemble 0-1 Credits
The Drexel University Mediterranean Ensemble is open to any student with an interest in performing traditional music from the Balkans, the Middle East and Northern Africa. All instruments are welcomed.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC 115 Gospel Choir 1.0 Credit
Performs gospel music drawn from both traditional and contemporary sources. Performance opportunities for both singers and instrumentalists. Concerts given on and off campus each term. May be repeated for credit.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC 116 Pep Band 0-1 Credits
Pep Band is a group of roughly forty-five student musicians primarily from the concert band. The purpose of the Pep Band is to support the Drexel Dragons basketball team and play from the bleachers at home games as well as travel to tournaments.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Corequisite: MUSC 105

MUSC 117 Rock Ensemble 0-1 Credits
Rock Ensemble is an ensemble where students have the opportunity to gain experience working as a group rehearsing, arranging, organizing, recording, and ultimately performing songs in the rock/pop/contemporary genres. By choosing music that is both of high quality and varied, students have a unique opportunity to develop a strong work ethic while being exposed to various musical challenges.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC 118 Chamber Music: Strings 0-1 Credits
MUSC 118 forms its participants into various sized string groups from trios and quartets to octets. The repertoire spans music of the classical tradition and beyond, from the modern day back to the 17th century. These small groups will perform as part of a larger chamber recital at the end of each term.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC 120 Music Fundamentals 3.0 Credits
Music Fundamentals teaches students essential skills and knowledge relating to Western music. Focus is placed on ear training and core music theory concepts. This course perfectly compliments any student's musical playing ability, beginning to advanced, and is essential to further musical development.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 121 Music Theory I 3.0 Credits
MUSC 121 covers the foundations of: notation, major/minor scales and keys, intervals, chord construction, phrase construction, small forms, and basic techniques of harmonizing a melody. The methodology centers on analysis combined with application.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 122 Music Theory II 3.0 Credits
MUSC 122 covers: texture and textural reduction, chromatic harmony, modulation, and large forms. This is a continuation of MUSC 121 and provides more depth into the topics of that course as well as offers advanced material. The methodology combines musical analysis with application.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: MUSC 121 [Min Grade: D]

MUSC 123 Music Theory III 3.0 Credits
Covers a variety of musical forms from binary and rondo to sonata-allegro, including both sectional and continuous forms, to gain an understanding of the relationship between form and the materials of music. Studies form both in relation to its historical evolution and in terms of its generative role in the creation of music.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: MUSC 122 [Min Grade: D]

MUSC 124 Jazz Theory 3.0 Credits
Jazz Theory introduces musical concepts and skills as they pertain to this specific style of music. The material discussed is foundational knowledge for jazz composition, arranging, and improvisation. Therefore, this course is suitable for students interested in jazz performance or composition.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: MUSC 121 [Min Grade: D]

MUSC 125 Ear Training I 1.0 Credit
Introduces the basics of ear training and sight singing.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: MUSC 121 [Min Grade: D]

MUSC 126 Ear Training II 1.0 Credit
Continues MUSC 125.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: MUSC 125 [Min Grade: D]

MUSC 127 Ear Training III 1.0 Credit
Continues MUSC 126.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: MUSC 126 [Min Grade: D]

MUSC 130 Introduction to Music 3.0 Credits
Provides an introduction to music in the European classical tradition, including elements of melody, harmony, rhythm, texture, structure, history, and principal composers. Emphasizes listening with understanding.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 134 Mambo, Samba, Salsa, and More 3.0 Credits
This course introduces the various Latin American musical traditions, as well as their historical contexts, evolution, inter-connectivity and current importance.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 152 Survey of Songwriting 3.0 Credits
This course will examine the art and craft of songwriting. Students will listen to and analyze many examples from folk and popular music, from the 1930's through to the present day. Students will use this knowledge, as well as that of basic music fundamentals, to compose a song at the end of the term.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 190 Class Piano I 2.0 Credits
Uses a group situation to teach basic performance skills and beginning instruction on piano.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 191 Class Guitar I 2.0 Credits
Uses a group situation to teach basic performance skills and beginning instruction on guitar.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 192 Class Percussion I 2.0 Credits
Uses a group situation to teach basic performance skills and beginning instruction on percussion.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 193 Class Voice I 2.0 Credits
Uses a group situation to teach basic performance skills and beginning instruction in voice.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 194 Class Bass I 2.0 Credits
Class Bass I uses group instruction to teach basic performance skills and techniques on electric bass guitar and upright bass.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 6 credits

MUSC 195 Class Bass II 2.0 Credits
Class Bass II uses group instruction to teach advanced performance skills and techniques on electric bass guitar and upright bass.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 6 credits

MUSC 196 Jazz Class Piano 2.0 Credits
Students will learn the fundamentals in jazz piano playing by studying the melodic, harmonic and rhythmic aspects associated with jazz. Students will learn how to read, "lead sheets" and improvise over modal and standard chord changes.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 229 Modern Arranging Techniques 3.0 Credits
Modern Arranging Techniques. Discusses the capabilities and ranges of varying instruments. Students study modern arranging techniques utilizing strategies and standard music material.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: MUSC 122 [Min Grade: D]

MUSC 231 Music History I 3.0 Credits
Surveys and analyzes compositions from antiquity through the Baroque period in European music history.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 232 Music History II 3.0 Credits
This course surveys and analyzes compositions from the Romantic Era through the 21st Century in Western music history.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 234 The Beatles 3.0 Credits
This course will examine the cultural phenomena of The Beatles from their early history as a band through the end of their regular collaboration in 1970. While The Beatles have been examined in many different ways, this course will concentrate on their productivity as a rock band through the single pop song, the pop album, and film. It will also serve to provide a more in depth study of the group and their influence on other popular culture.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 235 [WI] History of Film Music 3.0 Credits
This course surveys film music from the silent film era to the present. Topics will include the composers of the genre, the changing musical styles through the decades, and the techniques used by film composers.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 236 Rock Music Through the Mid-60s 3.0 Credits
Surveys rock music from its roots through the mid-60s.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 238 Rock Music Since the Mid-60s 3.0 Credits
Surveys rock music from the mid-60s through the mid-90s.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 241 Private Lesson 2.0 Credits
Weekly private music lessons on an instrument or voice as indicated by the section number. Lessons are fifty minutes per week. The specific day and time is mutually agreed upon by the instructor and the student. Musical style, level of ability, and learning objectives are individually based. Students are encouraged to contact the instructor if they have questions. Students are charged a lab fee every term they register.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC 249 Digital Music Composition 3.0 Credits
Digital Music Composition teaches students how to compose music intended to be produced by a computer and related to software, opposed to composing for acoustic instruments. Students will learn how to use specific music software and explore contemporary compositional techniques.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: MUSC 121 [Min Grade: D]

MUSC 252 Music Composition 3.0 Credits
Music Composition engages students in writing music for ensembles ranging from solo performer to large ensemble. Techniques of the common practice period as well as modernist harmonic techniques will be introduced and applied. Live performance of student projects will be provided and is an important feature of the course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: MUSC 229 [Min Grade: D]

MUSC 290 Class Piano II 2.0 Credits
Class Piano II is a continuation of Class Piano I. By the end of the term students will be able to perform a number of simple songs, play several scales and chord progressions, and have basic note reading skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: MUSC 190 [Min Grade: D]

MUSC 291 Class Guitar II 2.0 Credits
Class Guitar II is a continuation of Class Guitar I. In this course students continue to work on note reading in first position, develop rhythmic skills and reading ability in different keys, learn movable barred chords and power chords, and learn basic finger picking technique.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: MUSC 191 [Min Grade: D]

MUSC 300 Improvisation 0.0-3.0 Credits
Provides study and practice of various improvisatory styles in music. Includes classroom lectures, listening, and solo and ensemble performance.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 323 Songwriting 3.0 Credits
Addresses basic songwriting techniques including form, melody, rhythm, lyrics, and production. Projects are required.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: MUSC 121 [Min Grade: D]

MUSC 331 World Musics 3.0 Credits
Surveys various musical traditions from around the world in their cultural contexts. Includes selected music from Africa, the Americas, Europe, South Asia, Southeast Asia, Northeast Asia, West Asia, and Oceania.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 333 Afro-American Music USA 3.0 Credits
Examines the African heritage and related New World forms outside the United States. Covers work songs, spirituals, blues, folk music, ragtime, gospel, rhythm and blues, jazz, etc.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 336 History of Jazz 3.0 Credits
Surveys the music popularly known as jazz from before 1900 through the stylistic changes and trends of the 20th century. Covers precursors, early jazz, big bands, bebop, the new music, etc.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 338 [WI] American Popular Music 3.0 Credits
Examines popular music (dances, marches, ragtime, jazz, musical comedy, movie music, swing, rock, etc.) from Colonial times to the present, with cultural-historical contexts. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MUSC 341 Advanced Applied Music 2.0 Credits
Weekly private applied music instruction at the advanced level. Fee requirement. May be repeated for credit.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC 342 Applied Music-Recital 2.0 Credits
Students will present a public recital featuring significant solo repertoire. Repertoire choices for recital must be made through the Applied Music instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: MUSC 241 [Min Grade: D]

MUSC 495 Directed Studies in Music 0.5-12.0 Credits
Provides supervised individual study of special subjects in music. May be repeated for credit. Department permission required.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC I199 Independent Study in MUSC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC I299 Independent Study in MUSC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC I399 Independent Study in MUSC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC I499 Independent Study in MUSC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC T180 Special Topics in Music 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC T280 Special Topics in Music 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC T380 Special Topics in Music 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MUSC T480 Special Topics in Music 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Music Industry Program

Courses

MIP 132 Survey of the Recording Industry 3.0 Credits
This course offers a comprehensive overview of the history of the
Recording Industry plus an in-depth examination of the key changes
that have affected the world of the Industry over the past 25 years.
Marketing, Promotion, Branding, Music Streaming, Touring, Social Media
development, and artist development will be covered.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.

MIP 133 Digital Audio Workstations I 3.0 Credits
This course will provide students with a basic understanding of Digital
Audio Workstation theory and practice as it relates to content creation
through Music Instruments Digital Interface (M.I.D.I.) sequencing. In
addition to M.I.D.I. sequencing, students will be introduced to editing, and
mixing.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.

MIP 161 Copyrights in the Music Industry 3.0 Credits
This course is an in-depth exploration of what, how, when and where
intellectual property exists in the music industry, with a particular
emphasis on the role that copyrights play.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.

MIP 170 Radio Management 3.0 Credits
Students learn about the growth and development of radio through the
20th century to today, including current challenges and new technologies,
programming and marketing techniques, payola, organizational structure,
corporate consolidation, the F.C.C., podcasting, satellite, and internet
radio. Students also create their own radio stations and formats.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MIP 179 Introduction to Sound Recording 2.0 Credits
Introduces the art of sound recording, including fundamentals of sound,
sound capture, acoustic environment, recording devices, and the
recording studio. Stakeholders, such as engineers, producers, and
technicians are discussed.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Corequisite: MIP 227

MIP 227 Listening Techniques 1.0 Credit
Students will develop critical listening skills needed for all aspects of
music production including commercial arranging, tracking, and mixing.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Corequisite: MIP 179

MIP 233 Digital Audio Workstations II 3.0 Credits
This course focuses on Digital Audio Workstation techniques used in
modern audio production. This course will provide students with a basic
understanding of Digital Audio Workstation theory of operation, system
setup and troubleshooting, audio recording, editing, and "in the box"
mixing.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: MIP 133 [Min Grade: C]

MIP 262 Trademarks and Patents in the Music Industry 3.0 Credits
This course is an in-depth continuation of the exploration of what, how,
when and where intellectual property exists in the music industry, with a
further emphasis on the use of trademarks and patents in the music and
music software industries.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.

MIP 263 Media Promotion 3.0 Credits
Students learn about the procedures and mechanisms used to promote
music and music-related content through various media forms,
primarily radio and video, and through any new media forms recently or
futuristically discovered.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is EAM or major is MUSI.
Prerequisites: MIP 170 [Min Grade: D]

MIP 270 Live Music Industry 3.0 Credits
Course examines the basic concepts, key terms and roles of all essential
players for both the venue management and touring and concert
promotion industry and the relationships between venues, booking
agents, tour managers and media.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.

MIP 276 Sound Recording for Business Concentration 3.0 Credits
Sound recording techniques are presented to provide Music Industry
Business Concentration students with basic recording competency
through practical application. Students are required to create several
recordings through projects that require teamwork and self-analysis.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: MIP 179 [Min Grade: C]

MIP 279 Sound Recording I 3.0 Credits
Basic sound recording procedures are presented with an emphasis on microphone techniques, signal-flow, and session workflow. Requires students to create several multitrack recordings, including editing and mixing.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Cannot enroll if classification is Freshman
Prerequisites: MIP 233 [Min Grade: D]

MIP 293 [WI] Survey of Music Production 3.0 Credits
This course analyzes various music recordings, including the genres of jazz, pop, R&B, and rock, from the modern recording era (1930's to the present) and discusses the production techniques used to create them.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.

MIP 318 Music Merchandising 3.0 Credits
Students work in interdisciplinary groups with Design and Merchandising students to create a comprehensive merchandise extension program including product selection, production, distribution and promotion within the context of the artists' overall brand package.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MIP 331 Music Venues and Concerts 3.0 Credits
Students will learn how to operate a music venue by learning how to book talent, market and promote, staff and hire personnel, create visibility, establish a long-term vision for the music venue.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.

MIP 333 Digital Audio Workstations III 3.0 Credits
This course focuses on advanced Digital Audio Workstation techniques used in modern recording production with an emphasis on audio editing. Sound replacement, pitch correction, alignment, audio quantization, and editing proficiency are covered.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: MIP 233 [Min Grade: D]

MIP 336 Contracts and Legal Issues in the Music Industry 3.0 Credits
This course explores contractual agreements and the legal issues affecting the music industry today, such as free speech in radio and music lyrics, rights of publicity for recording artists, fair use and piracy, as well as the various standard agreements in common use in the music and recording industries.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: MIP 161 [Min Grade: D] and BLAW 201 [Min Grade: D]

MIP 338 Audio Seminar 2.0 Credits
Students present Extra Curricular recording projects to the instructor and fellow students for an in-class critique. The in-class critique will give the student direct feedback on their creative work and allow them to compare their work against the work of their peers. The production critiques will be moderated by the instructor and grades will be assessed based on in-class participation and presentations.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 1 times for 4 credits
Restrictions: Can enroll if major is MUSI.
Prerequisites: MIP 379 [Min Grade: D]

MIP 341 Touring and Booking 3.0 Credits
Educates student about the Live Performance revenue stream in the music industry, encompassing tour management, tour planning and implementation, concert promotion agreements, insurance issues and revenue breakdowns.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.

MIP 358 Electronic Music Production 3.0 Credits
This course is a holistic approach to electronic music production through the study of its history and hands on digital audio workstations techniques.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: MIP 233 [Min Grade: D]

MIP 361 Music Publishing 3.0 Credits
This course explores the fundamental responsibilities of a music publisher including reviewing, evaluating, marketing, licensing, monetizing, representing and protecting original music, as well as the rights of songwriters and related content creators. Students will discover how music publishing is a crucial element of support in a thriving music industry and will learn how music publishers build value for their creative clients.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: MIP 161 [Min Grade: C]

MIP 365 Cities of Music and Culture 3.0 Credits
This course is designed to give students an introductory insight and understanding of the music industry in the chosen location of the class. This class is a Study Tour.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MIP 366 Music Supervision 3.0 Credits
Students will be introduced to the creative and administrative elements of music supervision including sourcing, evaluating, licensing, and placing music into visual productions.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: MIP 161 [Min Grade: D] or MIP 361 [Min Grade: D]

MIP 374 Entrepreneurship in the Music Industry 3.0 Credits
Students will learn how to devise, conceive, create and implement a music industry-related business through the drafting of a business plan. This course is team-driven and will involve student discussions and critique.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.

MIP 375 [WI] Marketing and Promo in Music Industry 3.0 Credits
This course is designed for students to understand marketing & promotion in the music industry and provide insight into the concepts of marketing and the tactics employed by labels, independent agents, and artists in the marketplace. Students will acquire the skills to assemble comprehensive, integrated marketing strategies that accompany a successful marketing campaign. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: MIP 132 [Min Grade: D] or MIP 272 [Min Grade: D]

MIP 376 MAD Dragon Music Group 3.0 Credits
MAD Dragon Music Group is designed to immerse students in the world of the independent music business and includes all of the professor led, student operated enterprises that create, organize and administer MAD Dragon Music Group projects.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 2 times for 9 credits
Prerequisites: MIP 132 [Min Grade: C]

MIP 379 Sound Recording II 3.0 Credits
An advanced examination of current state of the art sound recording techniques. Special attention is paid to concert recording, digital and analog mixing techniques, advanced compression and equalization techniques, and time-based processing. Research methods in sound are introduced.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI and classification is Junior or Pre-Junior or Senior.
Prerequisites: MIP 279 [Min Grade: C]

MIP 381 Audio for Video 3.0 Credits
This course will introduce the student to the technological and creative aspects of creating post-production audio for visual media.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: MIP 233 [Min Grade: D] and MIP 279 [Min Grade: D]

MIP 382 Scoring to Picture 3.0 Credits
This course will expand the students' ability to create and produce an original score for an audio/visual element, drawing upon their creative and technological skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Cannot enroll if classification is Freshman

MIP 384 Synthesis and Sampling 3.0 Credits
This is an advanced course focusing on the theory and operation of hardware and virtual synthesizers and digital audio samplers. Students learn how to identify and manipulate the various parameters of synthesis and sampling devices.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: MIP 233 [Min Grade: D]

MIP 386 Commercial Music Production 3.0 Credits
An examination of the various ways that music is composed and used in television advertising, industries, trailers/promos for film, television, and radio, including bumpers and station ids.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: MIP 381 [Min Grade: D]

MIP 387 Studio Maintenance 3.0 Credits
Introduces the student to basic maintenance and troubleshooting techniques used in the modern recording studio. Basic electronic components, cabling, soldering skills, audio measurements, and equipment calibration are emphasized.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: MIP 279 [Min Grade: C]

MIP 388 Music and Audio Freelancing 2.0 Credits
Students will gain an understanding of how to prepare for and develop a career as a freelancer in the music and/or audio industries. They will learn how to develop career goals and a plan of action, create a basic professional website, and learn the basic financial, business, and marketing practices of a freelancer.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Cannot enroll if classification is Freshman or Sophomore

MIP 389 Sound Reinforcement 3.0 Credits
This course covers all aspects of sound reinforcement for live performances, including system design, equipment usage, and acoustical concerns. The course uses both lecture and hands-on components for greater student understanding.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MIP 390 Video Game Music and Audio 3.0 Credits
The objective of this course is to give students a well-rounded understanding of the state of contemporary video game music and audio; how the game development process works; the evolution of game audio, and how to approach the creation of video game music and audio.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

MIP 391 Analog Recording 3.0 Credits
This class enables students to practice the art of analog recording, editing and mixing. It puts in perspective the concepts, tools, and techniques of studio production that can be taken for granted in the digital domain. The constraints and aesthetic choices that are magnified by the analog format are very important parts of a holistic music production curriculum.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI and classification is Junior or Senior.
Prerequisites: MIP 379 [Min Grade: C]

MIP 392 Music Production Master Class 1.0 Credit
A guest music producer and his team will share their knowledge of record production. Students will learn both technical and business aspects of professional record production and will be assigned projects helping them develop a high level of expertise and professionalism.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI and classification is Junior or Senior.
Prerequisites: MIP 379 [Min Grade: C]

MIP 394 Big Data In The Music Industry 3.0 Credits
This course offers a comprehensive overview of collecting, analyzing, and understanding all aspects of Big Data research in the music industry. By intensive studies of the analytics of the data flow and how that information is used, this course will show students how to interpret the ebb and flow of the music business.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: MIP 132 [Min Grade: D] and STAT 201 [Min Grade: D]

MIP 395 Digital Revenue & Creative Destruction 3.0 Credits
Students will study the disruption, destruction and transformation of the music industry business model through the lens of entrepreneurial innovation in the post-Napster era. This course is team-driven and will involve extensive student discussions and critique.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

MIP 396 Global Recording Business 3.0 Credits
This course is designed to give students a global perspective of the recording business. Students will research individual markets and compare and contrast them in order to evaluate business conditions and consider future economic prospects.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: MIP 132 [Min Grade: D]

MIP 426 Global Trends in the Music Industry 3.0 Credits
This course explores how the music, arts and entertainment industries operate and interact with a global perspective. Students will examine the unique attributes and different cultural and artistic components of global music industry centers with emphasis on "placemaking" factors, government-support models, economic landscape, market trends, chart history, deal types/income streams, hitmakers and moguls, and specific genres and styles emanating from around the world. Students will gain a greater understanding of how music, entertainment and various media platforms are perceived, supported and commoditized throughout the world.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: BLAW 201 [Min Grade: D]

MIP 433 Digital Audio Workstations IV 3.0 Credits
This course focuses on advanced Digital Audio Workstation techniques used in modern audio production. This course will explore trends in DAW technology and showcase emerging production techniques used in the creation of modern music.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: MIP 133 [Min Grade: D]

MIP 443 Entertainment Contracts I 3.0 Credits
This course encompasses drafting and negotiating the most common types of agreements in the music industry.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: BLAW 201 [Min Grade: D]

MIP 467 Artist Representation 3.0 Credits
Students will gain an historical perspective on the evolving role of the Manager from an entrepreneurial perspective. The class examines the core components that comprise an artist's professional team. The course will explore and analyze the central role that managers in particular, but also, attorneys, agents, business managers, services firms, record labels and other entities each play in representing, developing, and supervising the artist's overall business and brand.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Cannot enroll if classification is Freshman

MIP 468 Music Industry E-Commerce 3.0 Credits
This course explores the inner workings of commerce in the music industry as it occurs in the Internet. The student gains an understanding of how to market and promote websites, utilize social networking sites and how digital services for the industry can serve the label, artist and/or publishing company.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: MIP 132 [Min Grade: D]

MIP 477 Music Production 3.0 Credits
The students in this class learn contemporary music production techniques through a combination of lecture, demonstration and independent work.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: MIP 379 [Min Grade: D]

MIP 481 Mixing and Mastering 3.0 Credits
The art of mixing and mastering music are covered in depth. This is an advanced audio engineering course that will focus on the mixing and mastering process. Proper equipment usage, methods, formats, and production goals are covered.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is MUSI.
Prerequisites: MIP 379 [Min Grade: D]

MIP 491 Senior Project in Music Industry 3.0 Credits
Senior Project is a thesis course in which student groups engage over the three quarters of senior year in intensive research on a topic selected by a jury among individual proposals. The thesis will result in some form of publishable material. The student will present their thesis to a jury in their final quarter of senior year.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 12 credits
Restrictions: Can enroll if major is MUSI and classification is Senior.

MIP 495 Directed Studies in Music Industry 0.5-12.0 Credits
Provides supervised individual study of special topics in the music industry. Departmental permission required.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if major is MUSI.

MIP I199 Independent Study in Music Industry Program 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MIP I299 Independent Study in Music Industry Program 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MIP I399 Independent Study in Music Industry Program 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MIP I499 Independent Study in Music Industry Program 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MIP T180 Special Topics in Music Industry Program 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MIP T280 Special Topics in Music Industry Program 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MIP T380 Special Topics in Music Industry Program 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

MIP T480 Special Topics in Music Industry Program 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Naval Science

Courses

NSC 100 Naval Science Drill 0.0 Credits
A professional laboratory covering various aspects of naval leadership and professional development. While emphasis is given to military marching, formation, and parade, the course also includes lectures from sources in and out of the Navy. Guest speakers cover topics such as leadership, Navy career paths, equal opportunity, rights and responsibilities, AIDS awareness, terrorism/counter-terrorism, naval warfare doctrine, employment of naval forces, ethics and values, operations security, and safety.
College/Department: University Courses
Repeat Status: Not repeatable for credit

NSC 101 Naval Orientation/Introduction to Naval Science 0.0 Credits
A course designed to familiarize the student with the history, characteristics and present employment of sea power. Particular emphasis is placed upon our naval forces and their capability in achieving and maintaining our national objectives. Naval organization and operational functions are discussed in conjunction with sea power concepts. Additionally, the student is given an insight into the Naval Service, shipboard organization and safety, time management skills and study techniques.
College/Department: University Courses
Repeat Status: Not repeatable for credit

NSC 102 Seapower and Maritime Affairs 2.0 Credits
A broad survey of naval history designed to add historical perspective to current defense problems. Topics covered include: naval power as an aspect of national defense policy, navies as an instrument of foreign policy, strategy selection, resource control, technology, and manning.
College/Department: University Courses
Repeat Status: Not repeatable for credit

NSC 201 Leadership & Management 2.0 Credits
This course emphasizes principles of leadership, personnel and material management, and subordinate development in the context of the naval organization. Practical applications are explored through experiential exercises and case studies.
College/Department: University Courses
Repeat Status: Not repeatable for credit

NSC 202 Navigation I 2.0 Credits
A comprehensive study of the theory and practice of terrestrial, and electronic navigation and the laws of vessel operations. Topics include fundamentals of coastal and harbor piloting, electronic navigation and mean of navigating without reference to land. An in-depth study of the international and inland nautical Rules of the Road is also included. Case studies and practical exercises are used to reinforce the fundamentals of marine navigation.
College/Department: University Courses
Repeat Status: Not repeatable for credit

NSC 301 Engineering 2.0 Credits
This course provides an overview of how propulsion and electricity are provided to our Navy's fighting ships. The basic engineering principles relating to thermodynamics, steam propulsion (conventional and nuclear), gas turbine propulsion, internal combustion engines, electricity generation and distribution, and various support systems will be taught. Ship design, stability, damage control, and some engineering-related ethical issues will also be discussed.
College/Department: University Courses
Repeat Status: Not repeatable for credit

NSC 302 Weapons 2.0 Credits
This course provides an overview of the theory and concepts underlying modern weapons systems. The principles behind sensors and detection systems, tracking systems, computational systems, weapon delivery systems, and the fire control problem will be examined, with a consistent emphasis on the integration of these components into a "weapons system". Case studies will be used to illustrate and reinforce concepts introduced in the course.
College/Department: University Courses
Repeat Status: Not repeatable for credit

NSC 310 Evolution of Warfare 2.0 Credits
This course is designed to add broad historical perspective to understanding military power. Treating war and the military as an integral part of society, the course deals with such topics as: war as an instrument of foreign policy, military influences on foreign policy, the military as a reflection of society, manning and strategy selection.
College/Department: University Courses
Repeat Status: Not repeatable for credit

NSC 401 Navigation II 2.0 Credits
Insight into modern naval operations is gained through analysis of relative motion pertaining to ships at sea, underway replenishment, ship handling, and tactical communications. The process of command and control and leadership is examined through case studies of actual incidents at sea.
College/Department: University Courses
Repeat Status: Not repeatable for credit

NSC 402 Leadership and Ethics 2.0 Credits
The capstone course of the NROTC curriculum, this course is intended to provide the midshipman with the ethical foundation and basic leadership tools to be effective junior officers. Topics such as responsibility, accountability, ethics, the law of armed conflict, military law, division organization and training, and discipline are introduced through practical exercises, group discussion, and case studies.
College/Department: University Courses
Repeat Status: Not repeatable for credit

NSC 410 Amphibious Warfare 2.0 Credits
Maneuver Warfare is designed to provide a foundation of knowledge regarding leadership, tactics, and general military skills. Specific topics range from introduction to leadership and problem resolution, to Boyd's decision cycle and military law. Ideas are introduced and reinforced through a wide range of instructional methods, to include lecture, group discussion, practical application, and case studies.
College/Department: University Courses
Repeat Status: Not repeatable for credit

Neuroscience

Courses

NEUR 410 Neuroscience 4.0 Credits
This course is designed to provide the student with a strong foundation in the structure and function of the nervous system. Clinical correlations are provided throughout the course to underscore the necessity for understanding the material for effective clinical practice and to provide a neurophysiological basis for various pathological conditions commonly encountered in the practice.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ANAT 103 [Min Grade: D] or (BIO 201 [Min Grade: D] and BIO 202 [Min Grade: D])

Nursing

Courses

NURS 110 Essentials of Relationship-Based Professional Nursing Practice 4.0 Credits
This course provides students with the tools, strategies, and resources inherent in relationship-based professional nursing practice. This course focuses on exploring the historical context of nursing, introducing the IOM core competencies, and examining the role of the professional nurse in today's healthcare environment.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NACE or major is NURS.
Prerequisites: ANAT 102 [Min Grade: C] (Can be taken Concurrently)ANAT 101 [Min Grade: C] and (ENGL 102 [Min Grade: C] or ENGL 112 [Min Grade: C])

NURS 112 Relationship-Based Health Assessment & Promotion 5.0 Credits
This course focuses on establishing the professional nurse / patient relationship-based care that promotes and assesses health within the adult population. Special emphasis is placed on screening for health risks identified by national goals and population trends. The student develops physical assessment skills applicable to professional practice and incorporates health promotion activities associated with the guidelines established by Healthy People 2020.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NACE or major is NURS.
Prerequisites: NURS 110 [Min Grade: C] (Can be taken Concurrently)ANAT 101 [Min Grade: C] and ANAT 102 [Min Grade: C] and ANAT 103 [Min Grade: C]

NURS 120 Contemporary Health Care 3.0 Credits
Students will examine the role of nursing within the health care system; recognizing historical influences on current practice, organizational structures of healthcare, and informatics to promote quality care. Nursing standards, ethics, scholarship, policy and government are introduced.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

NURS 121 Relationship-Based Nursing Care 3.0 Credits
This course focuses on the development of skills for the practice of relationship-based nursing care (RBC) with an emphasis on both verbal and nonverbal communication to create a caring and healing environment for patients. An understanding of the dimensions of Relationship Based Nursing Care and how they apply to all three essential relationships will provide the framework for exploring best practices in nursing to promote patient safety while practicing patient centered care. Legal and ethical principles will be explored to examine their role in health care decision making. *This course is writing intensive for BSN Co-op students only.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

NURS 200 Principles of Nursing Practice 6.0 Credits
This course will focus on the concepts, skills, and the attitudes fundamental to professional nursing practice within a framework of clinical decision-making. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NACE or major is NURS.
Prerequisites: ANAT 103 [Min Grade: C] and BIO 226 [Min Grade: C] and MATH 108 [Min Grade: C] and CHEM 103 [Min Grade: C]
Corequisites: INFO 204, NURS 112

NURS 220 Foundations of Nursing Practice 8.0 Credits
This course will focus on the concepts, skills, and attitudes fundamental to professional nursing practice within a framework of clinical decision-making. It will also emphasize the professional nurse/patient relationship-based care that promotes and assesses health throughout the lifespan.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ANAT 103 [Min Grade: C] and MATH 101 [Min Grade: C] and BIO 226 [Min Grade: C] and NURS 120 [Min Grade: C] and NURS 121 [Min Grade: C] and NURS 221 [Min Grade: C]
Corequisite: NURS 222

NURS 221 Concepts of Pathophysiology in Nursing 3.0 Credits
This course builds upon the theoretical foundations of nursing theory, human anatomy, and physiology by addressing basic concepts, principles, and processes associated with common genetics, pathologies, physiologic alterations in body systems, and the body's ability to compensate for these changes.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ANAT 103 [Min Grade: C] and MATH 101 [Min Grade: C] and BIO 226 [Min Grade: C] and NURS 120 [Min Grade: C] and NURS 121 [Min Grade: C]

NURS 222 Medication Principles 3.0 Credits
This hands-on course will incorporate simulated medication administration experiences to provide students with foundational tools, strategies, and resources for medication calculation, administration and proper use of medical terminology.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

NURS 300 Comprehensive Adult Nursing I 6.0 Credits
This course will focus on the development of selected competencies for nursing care assessment and management of adults with predictable human responses to specific system alterations.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 200 [Min Grade: C] and NURS 112 [Min Grade: C]
Corequisite: NURS 301

NURS 301 Pharmacology for Nursing I 3.0 Credits
Introduces professional nursing students to the principles of
pharmacology and drug therapies, pharmacologic-therapeutic classes of
drugs and important drug information resources.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 200 [Min Grade: C] and NURS 112 [Min Grade: C]
Corequisite: NURS 300

NURS 303 Women's Health Nursing 0.0-6.0 Credits
This course focuses on the development of competencies for the nursing
care management of child-bearing families and health problems/concerns
that affect women. The course will also emphasize the nurse's role
in health assessment, health promotion, and promotion of adaptive
processes for the maternity patient and the promotion of women's health
in general. Sociocultural, economic, political, and ethical factors that
impact on health promotion, disease prevention, and risk reduction for
the childbearing family and women in general are examined. Selected
women's health clinical settings will be utilized for clinical practice.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 300 [Min Grade: C] and NURS 301 [Min Grade: C]

NURS 304 Nursing of Children 6.0 Credits
This course focuses on the development of competencies for the nursing
care management of children experiencing potential and actual alterations
in health. An emphasis will be placed on the nurse's role in health
assessment, health promotion, and promotion of adaptive processes
for the child within the context of the family. Selected pediatric clinical
agencies will be utilized for clinical practice.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 300 [Min Grade: C] and NURS 301 [Min Grade: C]
and NURS 308 [Min Grade: C]

NURS 305 Comprehensive Adult Nursing II 6.0 Credits
This course is a continuation of NURS 300. It will focus on the
development of selected competencies for nursing care assessment
and management of adults with predictable human responses to specific
system alterations. Risk reduction, recovery, and rehabilitation of
patients with selected disease processes and common clinical problems
are addressed. Didactic medical-surgical content will focus on the
gastrointestinal, renal, immunologic, integrumentary, sensorineural,
neurologic, musculoskeletal, male reproductive, and infectious disease
systems. Home care principles and health policy for adults with common
acute and chronic illnesses and diseases will also be explored. Selected
general medical-surgical settings and home-care agencies will be utilized
for clinical practice.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 300 [Min Grade: C] and NURS 301 [Min Grade: C]
Corequisite: NURS 306

NURS 306 Pharmacology for Nursing II 3.0 Credits
This course is a continuation of NURS 301. The course will begin with
a review of drug and dosage calculations. This course will focus on
drugs and caradiovascular and renal systems, respiratory system,
antiinfective and anti-inflammatory agents, immune and biologic modifiers
and chemotherapeutic agents, gastrointestinal system and nutrition,
and miscellaneous therapeutics including hematologic, dermatologic,
opthalmic, and optic agents. Strategies to prevent medication errors in
health care agencies will be discussed.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 301 [Min Grade: C]

NURS 308 Mental Health Nursing 6.0 Credits
This course focuses on the development of competencies necessary for
the practice of mental health nursing with emphasis on the use of self in
relationships with patients and health team members. An understanding
of the brain-behavior connection and the importance of the therapeutic
nurse-patient relationship will provide the framework for exploring factors
which contribute to stress, maladaptive behaviors and mental illness.
Cross-cultural aspects of mental health and appropriate culturally relevant
interventions will also be emphasized. Selected inpatient and outpatient
mental health settings and agencies will be utilized for clinical practice.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NACE or major is NFTT or major is
NURS.
Prerequisites: NURS 300 [Min Grade: C] and NURS 301 [Min Grade: C]

NURS 310 Courageous Action: Leading Authentically 3.0 Credits
This course is the first in a series of three courses included in the Macy
Undergraduate Leadership Fellow's Program. Completion of all courses
earns students nine credits and recognition as a Macy Undergraduate
Leadership Fellow. Courageous Action: Leading Authentically will
enable students in the undergraduate health professions programs an
opportunity to embark on paths of personal leadership development; gain
a deeper understanding and appreciation of differences; provide students
with ideas, techniques, and tools to assist them in their leadership
development journeys; explore concepts such as the power of your
life story, discovering your authentic self, knowing and clarifying your
values, leadership principles, ethical boundaries, and understanding your
motivated capabilities.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NURS.

NURS 311 Group Dynamics and Leading Teams 3.0 Credits
This course is the 2nd in a series of 3 courses of the Macy Undergraduate Leadership Fellow's Program. NURS 311 focuses on leading teams and understanding group dynamics that are inherently linked to interpersonal processes/relationships and structural characteristics that influence teams and individual behavior during interactions. This course will explore various aspects of group dynamics such as emotional intelligence, power, perception, motivation, leadership, and decision-making. The goal is to develop skills in diagnosing opportunities and threats that face teams, enhance teamwork expertise as well as one's judgment, understanding, and competence to be better facilitators of one's own and others' learning in a variety of group situations.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 310 [Min Grade: C]

NURS 312 Leadership in Action and Community Health 3.0 Credits
This course is the third in a series of 3 courses of the Macy Undergraduate Leadership Fellow's Program. Grounded in a social justice perspective, this course encourages critical thinking about health outcomes framed by the broad context of the political and social environment. This course offers a hands-on opportunity for students to explore what it means to be civically engaged since they are required to engage in 40 hours of service in the community throughout Spring Quarter. The goals are to support understanding of complex health issues and to empower students in their development as agents of positive change. This course will draw heavily on students' involvement in service and will weave these together with elements of other academic coursework and future academic/career goals.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 310 [Min Grade: C] and NURS 311 [Min Grade: C]

NURS 320 Health and Illness Concepts I 6.0 Credits
This course will focus on nursing care of common health alterations for the adult population. Emphasis will be on the development of evidence-based, holistic care pertaining to the prevention, treatment, recovery, and long-term management of alterations related to the concepts of oxygenation, homeostasis, and perfusion.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 120 [Min Grade: C] and NURS 121 [Min Grade: C] and NURS 220 [Min Grade: C] and NURS 221 [Min Grade: C] and NURS 222 [Min Grade: C]
Corequisite: NURS 323

NURS 321 Health and Illness Concepts II 6.0 Credits
This course will focus on nursing care of common health alterations. The focus will be on the development of evidence-based, holistic care pertaining to the prevention, treatment, recovery, and long term management of alterations related to homeostasis and protection and movement.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 320 [Min Grade: C] and NURS 323 [Min Grade: C]
Corequisite: NURS 329

NURS 322 Concepts of Mental Health Nursing 6.0 Credits
This course focuses on the development of competencies for the practice of mental health nursing with emphasis on the use of self in relationships with patients and health team members. An understanding of the brain-behavior connection and the importance of the therapeutic nurse-patient relationship will provide the framework for exploring factors which contribute to stress, maladaptive behaviors and mental illness. Emphasis will be on the development of evidence-based, holistic care pertaining to the prevention, treatment, recovery, and long-term management of alterations related primarily to the concepts of coping and stress tolerance, emotions, cognitive functions, and maladaptive behavior.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: PSY 120 (Can be taken Concurrently)NURS 320 [Min Grade: C] and NURS 323 [Min Grade: C] and NURS 321 [Min Grade: C] and NURS 329 [Min Grade: C]

NURS 323 Nursing Pharmacology Concepts I 3.0 Credits
This course introduces the professional nursing student to the concepts of pharmacology and drug therapies, pharmacological-therapeutic classes of drugs, and important drug information resources. Knowledge of pharmacology provides the nurse with information to provide drug related patient care; optimizing beneficial effects of medications while minimizing adverse effects. The focus of the course is pharmacology basics and drugs affecting the cardiovascular, renal, respiratory, and endocrine systems. In addition, immune and biologic modifiers, chemotherapeutic agents, and psychotherapeutic drugs are presented. Legal, ethical, and cultural considerations in pharmacology as well as lifespan considerations with regard to pharmacotherapeutics and medication administration are addressed.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 120 [Min Grade: C] and NURS 121 [Min Grade: C] and NURS 220 [Min Grade: C] and NURS 221 [Min Grade: C] and NURS 222 [Min Grade: C]
Corequisite: NURS 320

NURS 325 [WI] Critical Issues in Nursing 4.5 Credits
The health care system has undergone dramatic shifts, driven by changing economic, demographic, and technological forces. This course explores the impact of these forces on health care delivery, and concerns relating to ethical, legal, and social issues that influence nursing practice.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NUOL.

NURS 326 Reproductive Health Across the Lifespan 6.0 Credits
This course focuses on management of human reproductive health and sexual issues with an emphasis on women and newborn health. It explores social determinants of health and their impact on health promotion, risk reduction, and disease prevention for the child bearing family. Women's health clinical settings will be utilized for clinical practice.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 320 [Min Grade: C] and NURS 323 [Min Grade: C] and NURS 321 [Min Grade: C] and NURS 329 [Min Grade: C] and NURS 322 [Min Grade: C]

NURS 327 Population Health Concepts 6.0 Credits
The focus of this course is the professional nurse's role in working with aggregates in the community. The principles of health promotion and illness prevention form the basis of effective population health nursing practice. Epidemiological and multiple sources of data are used to understand the social and ecological determinants of health.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 320 [Min Grade: C] and NURS 321 [Min Grade: C] and NURS 322 [Min Grade: C] and NURS 323 [Min Grade: C] and NURS 329 [Min Grade: C] and NURS 328 [Min Grade: C]

NURS 328 Pediatric Health Concepts 6.0 Credits
The concepts of human development and family dynamics in healthcare will be introduced. Building upon the concepts from previous courses, students will develop evidence-based, holistic, and ethically sound plans of care for pediatric populations. Prevention, treatment, recovery, and long-term management of health alterations in pediatric populations will be addressed.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 320 [Min Grade: C] and NURS 321 [Min Grade: C] and NURS 323 [Min Grade: C] and NURS 329 [Min Grade: C] and NURS 322 [Min Grade: C]

NURS 329 Nursing Pharmacology Concepts II 3.0 Credits
This course will introduce the professional nursing student to the concepts of pharmacology and drug therapies, pharmacologic-therapeutic classes of drugs, and important drug information resources. Pharmacological knowledge goes beyond medication preparation and administration and involves knowledge of the mechanism of action, drug effects, therapeutic uses, side effects, and adverse effects. The focus of the course will be on pharmacology basics and drugs affecting the gastrointestinal, immunological, neurological, musculoskeletal, and dermatological systems. Legal, ethical, and cultural considerations in pharmacology, herbal, botanical and nutritional supplements, and lifespan perspectives for medication administration will also be discussed.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 323 [Min Grade: C] and NURS 320 [Min Grade: C]
Corequisite: NURS 321

NURS 330 [WI] Nursing Research: Methods and Critical Appraisal for Evidence-Based Practice 4.5 Credits
This course will introduce the student to the theoretical and research bases on which practice is built. Students will examine the knowledge that guides nursing interventions and critique published research reports. The importance of reviewing the nursing literature in order to maintain currency in practice will be addressed. Ethical issues as they relate to research, theory, and practice will be discussed. This is a writing intensive course.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NUOL or major is NURS and classification is Senior.
Prerequisites: STS 345 [Min Grade: C] and NURS 325 [Min Grade: C]

NURS 335 Genetics and Genomics: Application to Nursing Practice 4.5 Credits
This course focuses on current issues in genetics, genomics, and pharmacogenomics and healthcare. Genetic and genomic influences across the healthcare continuum (health prevention, health promotion, disease management, and personalized medicine) are addressed.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NUOL or major is NURS.

NURS 338 Introduction to Complementary & Integrative Health 3.0 Credits
This course provides an introduction to the underpinning philosophy and practice of complementary and integrative health (CIH). It presents an evidence-based review of the major categories including: phytomedicine, clinical aromatherapy, mind-body interventions, and the role of spirituality in health and healing. In addition, students explore effective relaxation techniques that help to integrate the mind-body-spirit connection, which support health and well-being.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

NURS 339 Pathophysiology 3.0 Credits
Pathophysiology for Nurses. This course builds upon the theoretical foundations of nursing theory; human anatomy, and physiology by addressing basic concepts, principles, and processes associated with common pathologies, physiological alterations in body system, and the body's ability to compensate for these changes.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ANAT 103 [Min Grade: C] and CHEM 103 [Min Grade: C] and BIO 226 [Min Grade: C]

NURS 340 Transformational Leadership 4.5 Credits
The purpose of this course is to broaden the Registered Nurse's scope of knowledge in transformational leadership and how it can be implemented formally and informally in the healthcare setting. Clear communication improves patient outcomes as well as creating a healthier work environment for all providers. These two themes (Communication and Healthy Work Environments) are crucial elements introduced in this course. The course also expands the learner's skills of self and situational leadership.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NUOL or major is NURS.

NURS 345 Holistic Self-Care 3.0 Credits
Holistic Self-Care provides students with an A-Z approach to "living" a holistic, balanced life, complete with step-by-step guidelines necessary to incorporate dietary and lifestyle changes and effective stress reduction and stress management techniques to assist in navigating through the common challenges associated with student life and beyond. Students will be required to purchase a "Holistic Student Stress Reduction Kit", complete with specific essential oils, Meditation DVD, and guided stress reduction techniques.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

NURS 346 Health Assessment 6.0 Credits
This course is designed to assist professional nurses in developing interviewing skills, physical assessment techniques, and preventive health interventions when working with diverse and vulnerable populations.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NUOL.
Prerequisites: NURS 325 [Min Grade: C]

NURS 350 Independent Study in Nursing 1.0-3.0 Credit
This is a guided independent study. Students study a subject under the supervision of the nursing faculty member. May be repeated for credit.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 3 times for 9 credits

NURS 380 Complex Systems of Care: Technology, Patient Safety & Quality 6.0 Credits
The course explores potential and actual ethical implications of advances in science and technology and the importance of creating a culture of safety within the healthcare environment. The course provides learners with opportunities to explore and create linkages between technology, cost-effectiveness, safety, quality outcomes and the delivery of care. Course activities promote critical reflection and communication skills needed for learners to become active, effective, and safe members of interdisciplinary care teams.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NUOL.
Prerequisites: NURS 325 [Min Grade: C]

NURS 400 [WI] Leadership, Management, and Entrepreneurship in Nursing 3.0 Credits
Focuses on professional nursing role in applying principles of leadership and management in health care organizations across the continuum of care. Emerging and roles for nurse entrepreneurs and professional practitioners will be explored. Also emphasizes the role of the professional nurse in efficient patient care management in complex health care settings. This is a writing intensive course.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NACE or major is NURS.
Prerequisites: NURS 305 [Min Grade: C]

NURS 401 Comprehensive Adult Nursing III 6.0 Credits
This course will focus on the development of selected competencies for nursing care assessment and management of adults with unpredictable and complex human responses to specific system alterations. The course will emphasize the assessment of functioning, adaptation, and recovery for patients with high acuity illnesses and clinical problems. Selected high acuity acute care settings will be utilized for clinical practice.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 303 [Min Grade: C] and NURS 304 [Min Grade: C] and NURS 305 [Min Grade: C] and NURS 306 [Min Grade: C] and NURS 308 [Min Grade: C]

NURS 403 Community Public Health Nursing 0.0-6.0 Credits
The focus of this course if the professional nurse's role in working with aggregates in the community. The student will first reexamine the principles of health promotion as they form the bases for effective community health nursing practice. The student will then explore the role of the community health nurse working collaboratively with the community as part of an interdisciplinary team. Grounded in systems theory and informed by the concepts and principles of community health nursing, public health nursing, wellness, health promotion, and national goals, the student works with aggregates in the community setting. An introduction to conceptual frameworks that guide community-based, population-focused practice and research is included in both the classroom and clinical portions of the course.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 303 [Min Grade: C] and NURS 304 [Min Grade: C] and NURS 305 [Min Grade: C] and NURS 306 [Min Grade: C] and NURS 308 [Min Grade: C]

NURS 407 [WI] Issues in Aging and Longevity 4.5 Credits
This course focuses on current issues in promoting longevity with healthy aging. Current biopsychosocial theories on aging are explored. The multidisciplinary needs of older adults, including relationship challenges, are addressed.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NUOL.
Prerequisites: NURS 325 [Min Grade: C] and NURS 330 [Min Grade: C]

NURS 410 Pharmacology for Practicing Nurses 5.0 Credits
This course builds upon the practicing nurses' educational and experiential foundation in pharmacotherapeutics. Course emphasis includes the pharmacokinetics and pharmacodynamics of drug classes commonly encountered by the professional nurse. The interaction between pharmacodynamics and pathophysiology of disease states is analyzed. Critical evaluation of complex safety and interaction issues is developed.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NUOL.

NURS 420 Health and Illness Concepts III 6.0 Credits
This course will focus on the nursing care, assessment and management of patients with complex healthcare needs related to the constructs of homeostasis, regulation, perfusion, oxygenation, protection, and attributes and role of the nurse.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 320 [Min Grade: C] and NURS 321 [Min Grade: C] and NURS 323 [Min Grade: C] and NURS 326 [Min Grade: C] and NURS 328 [Min Grade: C] and NURS 329 [Min Grade: C]

NURS 421 Holistic Gerontological Nursing 6.0 Credits
This course will focus on a holistic and interprofessional approach to nursing care and coordination to meet the unique health needs of a diverse and growing population of older adults. The continuum of aging, including normal changes of aging, health and illness, acute and chronic conditions, and the end of life will be emphasized. Students' clinical experiences will be in a variety of settings reflective of health promotion and palliative care delivery options available to meet the health and illness trajectory needs of the older adult.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 320 [Min Grade: C] and NURS 321 [Min Grade: C] and NURS 323 [Min Grade: C] and NURS 328 [Min Grade: C] and NURS 329 [Min Grade: C]

NURS 422 Leadership Concepts in Nursing 0.0-3.0 Credits
This course will focus on the professional nursing role in applying principles of leadership and management across the continuum of care. Emerging and new roles for nurse entrepreneurs and professional practitioners will be explored. Also emphasizes the role of the professional nurse in efficient patient care management in complex health care settings and advocacy in health policy.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 321 [Min Grade: C] and NURS 329 [Min Grade: C]

NURS 423 [WI] Research Basis of Nursing Practice 4.0 Credits
This course will introduce the student to the theoretical and research basis on which practice is built. Students will examine the knowledge that guides nursing interventions and critique published research reports. The importance of reviewing the nursing literature in order to maintain currency in practice will be addressed. Ethical issues as they relate to research, theory and practice will be discussed. *This course is a writing intensive class for BSN Co-Op students only.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NURS 321 [Min Grade: C] and NURS 329 [Min Grade: C] and STS 345 [Min Grade: C]

NURS 450 Contemporary Gerontological Nursing 0.0-6.0 Credits
This course will focus on the nursing management of older adults. Contemporary theories of gerontology, theories of aging, physiological/psychological functioning, impact of developmental changes, illness, and dysfunction will be emphasized. The geriatric patient will be examined at various levels -- healthy older adult, older adult at risk, the older adult experiencing acute and chronic illness. Students' clinical experiences will be in home health agencies, transitional, and long-term facilities.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: NURS 303 [Min Grade: C] and NURS 304 [Min Grade: C] and NURS 305 [Min Grade: C] and NURS 306 [Min Grade: C] and NURS 308 [Min Grade: C] and NURS 401 [Min Grade: C]

NURS 460 Population Health: Local & Global 6.0 Credits
Using the framework of Social Determinants of Health (Healthy People 2020) this course explores the skills, research, and roles needed by a community/public health professional working as part of an interdisciplinary team including community/global -based partners and health officials to promote a healthier community. The student will apply skills in community assessment; program planning and evidence-based population health interventions in order to help identify populations within the community attain and maintain their optimum level of health. In this course, 'community' may be defined as either a local or global community of the student's choice.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NUOL or major is NURS.
Prerequisites: NURS 330 [Min Grade: C] and NURS 325 [Min Grade: C]

NURS 465 Senior Capstone in Nursing 4.5 Credits
The student, with faculty supervision, plans a project that will be implemented this quarter. This project will integrate the academic and practical knowledge the student has acquired in the RN-BSN curriculum. Students will develop objectives relevant to the project, critique the literature, and present a plan for implementation.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NUOL and classification is Senior.
Prerequisites: NURS 407 [Min Grade: C] (Can be taken Concurrently)NURS 325 [Min Grade: C] and NURS 330 [Min Grade: C]

NURS 481 Issues & Resolutions in End of Life Care 3.0 Credits
Promotes understanding of complexities associated with care of clients and families across the lifespan at end-of-life. Explores nursing management of individuals and families facing end-of-life care and decisions. Emphasis on evidenced-based practice in legal, ethical and professional decision-making framework. Conforms with AACN/ELNEC model.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NURS and classification is Senior.

NURS 482 Cultural Dimensions of Nursing Care 3.0 Credits
The focus of this course will be on strategies for providing culturally competent nursing care in a multicultural society. Emphasis is placed on evidence-based nursing practice within a framework of ethical, legal, and professional decision making.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NURS and classification is Senior.

NURS 483 Human Trafficking 3.0 Credits
This course introduces students to what human trafficking is, how to identify victims, what health problems are common among this population, special considerations to be aware of when working with trafficking victims and how to access services for them. In addition, the course will distinguish between various types of human trafficking/slavery such as sex trafficking, bonded and forced labor, domestic servant labor and child soldiers. It will also provide an overview of the history of human trafficking and counterstrategies, discuss the causes and physical, emotional and social consequences of human trafficking, and will assess the achievements of counter-strategies devised and implemented by governments, international organizations, private sectors and NGOs.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

NURS 489 Synthesis of Nursing Knowledge 4.0 Credits
Synthesis of Nursing Knowledge. This course prepares students for senior seminar by providing a comprehensive content review of clinical material and culminating in a comprehensive HESI exam. Skills needed for effective interpersonal communication and professional behaviors of the nurse will be learned and rehearsed utilizing the standardized patient lab experience. May be repeated once for credit.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 1 times for 4 credits
Prerequisites: NURS 401 [Min Grade: C]

NURS 492 Senior Seminar in Nursing 0.0-3.0 Credits
This course will serve as a review of important concepts from the nursing curriculum. Students will focus on those concepts that they need to improve for the successful practice of professional nursing. Students will utilize the Nursing Technology lab to review procedures practiced throughout the nursing curriculum and will use computerized testing to gauge their mastery of professional nursing content.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: NURS 303 [Min Grade: C] and NURS 304 [Min Grade: C] and NURS 305 [Min Grade: C] and NURS 306 [Min Grade: C] and NURS 308 [Min Grade: C] and NURS 401 [Min Grade: C] and NURS 403 [Min Grade: C] and NURS 489 [Min Grade: C]

NURS 495 Comprehensive Nursing Concepts 3.0 Credits
This course will serve as a comprehensive review of important and essential concepts from the nursing curriculum. Students will focus on those concepts that they need to improve for the successful practice of professional nursing. Students will utilize the Nursing Academic Clinical Support Services (NACSS) to review procedures practiced throughout the nursing curriculum, in particular the core professional skills, and will use computerized testing to gauge their mastery of professional nursing content.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: NURS 421 [Min Grade: C] and NURS 328 [Min Grade: C] and NURS 326 [Min Grade: C]
Corequisite: NURS 420

NURS I199 Independent Study in Nursing 1.0-3.0 Credit
The doctoral student works under the guidance of a faculty member to study in depth a topic related to their program of study. Independent study courses can be undertaken when there is no specific formal coursework available to support either the student's dissertation topic, or area of interest. Specific objectives and requirements are negotiated individually and the student will sign an Independent Study Contract. The course may be repeated more than once provided different faculty members supervise the learning experience.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 1 times for 9 credits

NURS T180 Special Topics 0.0-3.0 Credits
Course consists of content that faculty or students have requested to meet special needs or interests. Content is variable and offered on a one-time, infrequent, or trial basis. Actual course description will be determined by the instructor. May be repeated up to 3 times for credit if topics vary.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 3 times for 12 credits

NURS T280 Special Topics 0.0-3.0 Credits
Course consists of content that faculty or students have requested to meet special needs or interests. Content is variable and offered on a one-time, infrequent, or trial basis. Actual course description will be determined by the instructor. May be repeated up to 3 times for credit if topics vary.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 3 times for 12 credits

NURS T380 Special Topics 0.0-3.0 Credits
Course consists of content that faculty or students have requested to meet special needs or interests. Content is variable and offered on a one-time, infrequent, or trial basis. Actual course description will be determined by the instructor. May be repeated up to 3 times for credit if topics vary.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 3 times for 12 credits

NURS T480 Special Topics 0.0-3.0 Credits
Course consists of content that faculty or students have requested to meet special needs or interests. Content is variable and offered on a one-time, infrequent, or trial basis. Actual course description will be determined by the instructor. May be repeated up to 3 times for credit if topics vary.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 3 times for 12 credits

Nutrition & Food Science

Courses

NFS 100 Nutrition, Foods, and Health 2.0 Credits
Covers the six nutrient categories and how they function in the body. Includes nutritional implications of major diseases, food safety issues, and current food and nutrition controversies with an emphasis on personal health.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

NFS 101 Introduction to Nutrition & Food 1.0 Credit
Provides basic understanding of required nutrients and how they are used in the body. Students complete a computerized nutrient analysis and apply the science of nutrition and food to food choices to improve their personal health.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

NFS 111 Introduction to Dietetics 2.0 Credits
A survey of the dietetics field with emphasis on the role of the Registered Dietetics in practice. Discussion of current professional issues including evidence-based practice and the nutrition care process.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is DIET or major is HNUT.

NFS 200 Nutrition I: Principles of Nutrition 4.0 Credits
Covers principles of human nutrition, including energy metabolism. Covers physiological mechanisms and food sources of carbohydrates, lipids, proteins, vitamins, and minerals in relation to optimal human health.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NURS.
Prerequisites: CHEM 103 [Min Grade: C]

NFS 202 Nutrition: Wellness and Weight Management 3.0 Credits
This course is designed for undergraduate students who want to learn the positive and negative effects of foods, diet and lifestyle on disease and longevity. Students will be provided with evidence-based research related to wellness, lowering disease risk and weight management.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NFS 100 [Min Grade: B-]

NFS 203 Nutrition II: Nutrition in the Lifecycle 4.0 Credits
Covers nutrition in human life cycles with emphasis on prenatal, maternal, infant, childhood, adolescent, adulthood and later maturity. Also covers nutrient requirements and typical health and disease problems of each stage of the life span. Laboratory activities provide application of nutrition topics in preventive health activities related to the life span, with emphasis on diet-evaluation techniques.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: NFS 200 [Min Grade: C] or NFS 101 [Min Grade: C] or NFS 230 [Min Grade: C]

NFS 205 Introduction to Human Lactation 3.0 Credits
This course will provide a foundation in breastfeeding and human lactation, including breastfeeding education and promotion during the prenatal period, successful initiation of breastfeeding, prevention of many common pitfalls, and ongoing breastfeeding support. This course covers the fifteen specific areas required by Baby Friendly USA for all nurses working in prenatal and perinatal areas in Baby-Friendly Hospitals.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

NFS 215 Nutritional Chemistry 3.0 Credits
Covers the chemistry of carbohydrates, lipids, proteins, and nucleic acids and their behavior in the body's major metabolic mechanisms, including the role of vitamins and minerals in enzyme systems critical to normal human nutrient metabolism.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHEM 103 [Min Grade: C]
Corequisite: NFS 217

NFS 216 Nutrition and the Schoolchild 3.0 Credits
A course designed for future elementary school teachers to increase their knowledge of childhood nutrition as it relates to health promotion, health maintenance, and the prevention and treatment of nutritionally relevant health abnormalities in elementary school students. The scientific basis of nutrition and principles of education are emphasized. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NFS 100 [Min Grade: C]

NFS 217 Nutrient Quality & Composition 1.0 Credit
Applications of principles of nutritional chemistry involving macronutrients and micronutrients.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CHEM 103 [Min Grade: C]
Corequisite: NFS 215

NFS 220 Normal & Lifespan Nutrition 4.0 Credits
Builds on basic nutrition principles to include nutrient metabolism and chemical and biological aspects of nutrition. Addresses special nutrient needs of people through the life cycle.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: CHEM 103 [Min Grade: C]

NFS 230 Intermediate Nutrition 4.0 Credits
The role of nutrients in body structure and function. Factors involved in the availability, digestion, absorption, and utilization of nutrients. Identification of the normal nutritional needs of individuals, and sources of nutrients. The interpretation of current research in nutritional studies.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is NURS
Prerequisites: NFS 101 [Min Grade: C]

NFS 265 Professional Issues in Nutrition and Foods 3.0 Credits
Introduces professional issues in dietetics, food science, and nutrition science. Covers issues affecting current and future practice, and resources available to professionals in these fields.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: NFS 230 [Min Grade: C]

NFS 305 Clinical Issues in Human Lactation 3.0 Credits
The focus of this course will be to understand clinical aspects of lactation, including in- depth infant and maternal assessment and composition of human milk. Emphasis will be on first recognizing normal anatomy and physiology and then exploring presentations of the difficulties that breastfeeding dyads encounter. The course will examine the effects of infant and maternal characteristics as well as the effects of the birth on breastfeeding outcomes. Strategies to improve breastfeeding success will be discussed.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

NFS 310 Nutrition and Sports 3.0 Credits
After reviewing the fundamental processes of nutrition and human development, the course applies principles of nutrition to athletic conditioning, performance, and rehabilitation from sports-related injuries. Identifies evidence based recommendations for nutritional needs of today's athlete and explores the validity of sport diet fads. Development cycle of the recreational, amateur, and competitive athlete.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.

NFS 315 Nutrition in Chronic Disease 4.0 Credits
This course provides a basic understanding of nutrition therapy and its role in the prevention and treatment of medical conditions.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NFS 220 [Min Grade: C] or NFS 230 [Min Grade: C]

NFS 320 Pediatric Nutrition 4.0 Credits
This course provides an overview of pediatric nutrition assessment, as well as nutrition therapy and its role in the prevention and treatment of medical conditions found in the newborn through adolescent.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NFS 101 [Min Grade: C] or NFS 220 [Min Grade: C] or NFS 230 [Min Grade: C]

NFS 325 Nutrition & Exercise Physiology 3.0 Credits
An advanced level course covering nutrient needs to maximize exercise performance. Energy metabolism, with emphasis on macronutrient and micronutrient needs during different levels of exercise will be emphasized. Benefits of exercise in the prevention and treatment of chronic diseases and the safety of ergogenic aids will be discussed.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NFS 100 [Min Grade: C] or NFS 101 [Min Grade: C] or NFS 230 [Min Grade: C]

NFS 345 Foods and Nutrition of World Cultures 0.0-3.0 Credits
Provides an understanding of the diversity of cultural food choices and their nutritional implications. Includes an emphasis on cultural groups in the United States and methods to provide nutrition education to culturally diverse groups.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: CULA 115 [Min Grade: C]

NFS 365 [WI] Nutrition Laboratory: Food and Nutrient Analysis 0.0-4.0 Credits
Provides quantitative study of metabolism and observable effects of nutrient factors (vitamins, minerals, fats, carbohydrates, and proteins), using foods. This is a writing intensive course.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: NFS 215 [Min Grade: C] and NFS 217 [Min Grade: C]

NFS 370 Foodservice Systems Management 4.0 Credits
In-depth analysis of food purchasing, financial management of foodservices, cost controls, marketing in foodservice, equipment layout and design, and management/leadership theories and applications.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: HRM 215 [Min Grade: C]

NFS 371 Institutional Organization and Administration 3.0 Credits
Covers organization, administration, and application of managerial techniques in food-service systems; personnel training; job and person analysis; and morale and motivation. Includes field trips to food-service systems.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

NFS 391 Community Nutrition 0.0-4.0 Credits
Studies nutrition services provided by national, state, and local governments and private organizations. Discusses nutritional needs-assessment techniques and program-development methods. Field trips will be made to community nutrition programs.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Junior or Pre-Junior or Sophomore
Prerequisites: NFS 203 [Min Grade: C]

NFS 405 Public Policy of Breastfeeding 3.0 Credits
This course will examine the barriers to optimal breastfeeding using a socioecologic framework. Participants will gain a better understanding of the different factors that influence breastfeeding behaviors. Strategies to more effectively protect, promote and support breastfeeding will be discussed.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

NFS 415 Advanced Nutrition I: Macronutrition 4.0 Credits
Covers biochemical and physiological topics of macronutrient metabolism, with emphasis on ingestion, digestion, absorption, and excretion of carbohydrate, protein, and lipid.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: NFS 230 [Min Grade: C] and NFS 215 [Min Grade: C] and NFS 217 [Min Grade: C]

NFS 416 Advanced Nutrition II: Micronutrients 4.0 Credits
Provides in-depth study of vitamin and mineral absorption, metabolism, and degradation, with an emphasis on human health requirements and a thorough understanding of nutrient and dietary requirements.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: NFS 415 [Min Grade: D]

NFS 431 Nutrition Counseling 0.0-4.0 Credits
Emphasizes nutrition-counseling techniques for use with individuals and small groups. Includes development of nutrition education materials as well as verbal and non-verbal communication skills.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NFSC and classification is Senior.
Prerequisites: NFS 443 [Min Grade: C]

NFS 443 Medical Nutrition Therapy I 0.0-3.0 Credits
First of a three-course sequence examining the interrelationships of physiology, biochemistry, and nutrition as related to medical nutrition therapy. Emphasizes nutritional assessment and the role of nutrition in preventing and treating diseases/disorders: gastrointestinal diseases, diabetes, obesity, and cardiovascular disease.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Junior or Pre-Junior or Sophomore
Prerequisites: NFS 416 [Min Grade: C]

NFS 444 Medical Nutrition Therapy II 3.0 Credits
Second of a three-course sequence examining the interrelationships of physiology, biochemistry, and nutrition as related to medical nutrition therapy. Emphasizes nutrition assessment and the role of nutrition in preventing and treating disease/disorders; disease of the liver, pancreas, and gallbladder; pulmonary disease; renal disease; cancer; HIV/AIDS; allergies, pediatric disease; and metabolic disturbances.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Junior or Pre-Junior or Sophomore
Prerequisites: NFS 443 [Min Grade: C]

NFS 445 Medical Nutrition Therapy III 3.0 Credits
Third of a three-course sequence examining the interrelationships of physiology, biochemistry, and nutrition as related to severe/stressful conditions which require enteral or parenteral nutrition or other advanced medical nutrition therapies.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Junior or Pre-Junior or Sophomore
Prerequisites: NFS 444 [Min Grade: C]

NFS 446 Perspectives in World Nutrition 3.0 Credits
Examines world nutrition and food supply, including the nutritional status of various peoples, deficiency diseases, problems of food distribution, and other timely subjects.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

NFS 475 Advanced Seminar in the Dietetics Profession 3.0 Credits
Reviews, evaluates, and synthesizes contemporary professional issues in dietetics.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Junior or Pre-Junior or Sophomore
Prerequisites: NFS 203 [Min Grade: C]

NFS 485 Lactation Supervised Practice 3.0 Credits
Lactation Supervised Practice is designed to prepare competent, entry-level lactation consultants who will be eligible to sit the International Board Lactation Consultant Examination by completing Pathway 2. The course will provide appropriate experiences to practice the roles of lactation consultant under the supervision of a preceptor.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 2 times for 9 credits
Prerequisites: NFS 205 [Min Grade: C] and NFS 305 [Min Grade: C] and NFS 405 [Min Grade: C]

NFS 494 Senior Project I 2.0 Credits
First in a series of capstone courses in which student carry out the research process. In NFS 494, students work cooperatively to identify an applied, discipline oriented problem and then develop research hypotheses and a written research proposal in response to that problem.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NFSC and classification is Senior.

NFS 495 Senior Project II 2.0 Credits
Second in a series of capstone course in which students carry out the research process. In NFS 495, students work cooperatively to carry out the research objectives according to the research proposal developed in NFS 494.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NFS 494 [Min Grade: D]

NFS 496 Senior Project III 2.0 Credits
Third in a series of capstone course in which students carry out the research process. In NFS 496, students work cooperatively to document the finding of their research in NFS 495. Students make oral and poster presentations as well as produce a written report of their research results.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: NFS 495 [Min Grade: D]

NFS 497 Research 1.0-3.0 Credit
Provides individual research in nutrition under faculty supervision.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated 3 times for 9 credits
Restrictions: Cannot enroll if classification is Freshman

NFS I199 Independent Study in NFS 0.5-9.0 Credits
Provides individual study in nutrition under faculty supervision.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

NFS I299 Independent Study in NFS 0.5-9.0 Credits
Provides individual study in nutrition under faculty supervision.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

NFS I399 Independent Study in NFS 0.5-9.0 Credits
Provides individual study in nutrition under faculty supervision.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

NFS I499 Independent Study in NFS 0.5-9.0 Credits
Provides individual study in nutrition under faculty supervision.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

NFS T180 Special Topics in NFS 0.5-9.0 Credits
Covers selected topics of study in the field of nutrition and food.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

NFS T280 Special Topics in NFS 0.5-9.0 Credits
Covers selected topics of study in the field of nutrition and food.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

NFS T380 Special Topics in NFS 0.5-9.0 Credits
Covers selected topics of study in the field of nutrition and food.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

NFS T480 Special Topics in NFS 0.5-9.0 Credits
Covers selected topics of study in the field of nutrition and food.
College/Department: College of Nursing Health Professions
Repeat Status: Can be repeated multiple times for credit

Operations Management

Courses

OPM 200 Operations Management 4.0 Credits
Provides students with an understanding of the transformation process, which converts inputs into outputs. This is the primary function of every manufacturing/service organization, and how it adds value to the outputs. Discusses the decision-making process and techniques for planning and controlling the operations function.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Junior or Senior

OPM 315 Service Operations Management 4.0 Credits
Analyze service systems from the viewpoint of the operations manager to understand where and in what ways the body of knowledge developed in operations management, strategy, and marketing can be applied and where other approaches are necessary. Focus on understanding what customers want, designing systems and procedures delivering services, and controlling quality.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

OPM 321 Planning and Control of Operations 4.0 Credits
The course objective is to provide students with an understanding of managerial concepts and quantitative tools required in the design and operation of manufacturing/service systems. This course examines strategic planning decision problems, such as capacity planning, facility planning, locations decision, work/job design, and project management from the perspective of a production/operations manager of a business organization.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: STAT 205 [Min Grade: D] or STAT 201 [Min Grade: D]

OPM 325 Advanced Planning and Control of Operations 4.0 Credits
This course focuses on the medium to short-term managerial decision processes and models within the realm of the operations function of manufacturing and service organizations. Topics covered include time series forecasting, aggregate planning, materials management, operations and staff scheduling, and statistical quality control.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: OPM 321 [Min Grade: D] and OPR 320 [Min Grade: D]

OPM 341 Supply Chain Management 4.0 Credits
Presents and explains the concepts, insights, practical tools and decision support systems that are important for the effective managements of supply chains. Long-term strategic design issues, shorter-term tactical and operational issues are closely examined. State-of-the-art concepts of globally optimal decision making, often across traditional organizational boundaries are emphasized.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: OPM 325 [Min Grade: D]

OPM 342 Sustainable Supply Chain Management and Logistics 4.0 Credits
This course is a survey of solutions and techniques to design, evaluate, and improve supply chain operations with the goal of promoting environmental, social, and economic sustainability. Topics include product and process design for sustainability, cradle-to-cradle design, "green" sourcing and procurement, reverse logistics and closed-loop supply chains, supply chain coordination for sustainability, end-of-life management, facilities location and design, sustainable transportation and logistics solutions.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: OPM 341 [Min Grade: C-]

OPM 343 Managing Queues for Service Operations 4.0 Credits
The emphasis of this course is on waiting time management. The course will introduce quantitative methods to analyze queueing models and build insights and intuition about various performance metrics in queueing systems. Specifically, the course will establish an understanding of the impact of variability and utilization on the waiting time, and demonstrate the wide applicability of queueing models across various industries. The course will draw examples and case studies from a wide array of applications in service industries such as restaurants, entertainment, health care, insurance, financial institutions, and air transportation. The analytical tools covered in class aim to guide appropriate process design choices to improve system performance.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: (STAT 201 [Min Grade: C-] or STAT 205 [Min Grade: C-]) and OPM 315 [Min Grade: C-]

OPM 344 Revenue Management 4.0 Credits
The course will convey to future business leaders innovative ways to boost profitability. It will explore how firms can improve the operational management of the demand for their products (goods or services) to more effectively align it with their supply through business analytics lenses. It will introduce quantitative methods to improve decision-making, with special emphasis on spreadsheet modeling and analysis.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: OPR 320 [Min Grade: C-] and (STAT 201 [Min Grade: C-] or STAT 205 [Min Grade: C-])

OPM 399 Operations & Supply Chain Management Industry Project 4.0 Credits
This is a capstone course for students majored and minored in Operations and Supply Chain Management. Its objective is to provide students with an opportunity to apply the knowledge and skills learned from previous operations courses to solve business problems. Students will work in teams to, e.g., model a business process, collect data, analyze its operations efficiency and effectiveness, and provide recommendations for improvement.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: OPR 320 [Min Grade: C], OPM 341 [Min Grade: C] (Can be taken Concurrently)

OPM I199 Independent Study in OPM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

OPM I299 Independent Study in OPM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

OPM I399 Independent Study in OPM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

OPM I499 Independent Study in OPM 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated 3 times for 12 credits

OPM T180 Special Topics in OPM 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

OPM T280 Special Topics in OPM 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

OPM T380 Special Topics in OPM 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

OPM T480 Special Topics in OPM 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated 3 times for 12 credits

Operations Research

Courses

OPR 320 Linear Models for Decision Making 4.0 Credits
Applies modeling and mathematical techniques to complex decision problems in business, with a focus on deterministic systems. Covers linear programming, integer programming, goal programming and networks.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: MATH 102 [Min Grade: D] or MATH 122 [Min Grade: D]

OPR 330 Advanced Decision Making and Simulation 4.0 Credits
Applies modeling and mathematical techniques to complex decision problems, with a focus on nonlinearity and uncertainty in the business environment. Covers nonlinear programming, dynamic programming, queuing theory, Markov Processes, decision analysis and simulation.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: OPR 320 [Min Grade: C-] and (STAT 201 [Min Grade: C-] or STAT 205 [Min Grade: C-])

OPR 340 Decision Models for the Public Sector 4.0 Credits
This course will cover the basics of analytical modeling, optimization, and simulation as tools for decision-making in the public sector. The students will analyze cases illustrating the powerful impact of using these tools in cities across the country. Of particular focus will be the implementability of these tools and their recommendations in the real-world. Moreover, a city, especially one as big as Philadelphia, is a complex and dynamic environment, so we will investigate how to address some of the resulting challenges in our analyses. Specifically, we will address scenarios involving the improvement of existing operations, optimal resource allocation and distribution, and measuring and improving the quality and efficiency of service delivery.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: OPR 330 [Min Grade: C-]

OPR 350 Optimization in Finance 4.0 Credits
Quantitative finance can be grouped into the following categories: (1) valuation of financial instruments by the use of risk-neutral probability distributions; (2) financial planning using real-life probability distributions. This course focuses on financial planning. There are two key ideas: the first is to model decision making and planning as a mathematical optimization problem with variables, an objective function, and constraints. The second is to model uncertainty using the tools of probability theory. This is an introductory course: we focus on building models and use standard spreadsheet software to find solutions.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

OPR I199 Independent Study in OPR 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

OPR I299 Independent Study in OPR 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

OPR I399 Independent Study in OPR 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

OPR I499 Independent Study in OPR 0.5-4.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

OPR T180 Special Topics in OPR 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

OPR T280 Special Topics in OPR 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

OPR T380 Special Topics in OPR 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

OPR T480 Special Topics in OPR 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

Organizational Behavior

Courses

ORGB 300 [WI] Organizational Behavior 4.0 Credits
Provides conceptual understanding of various principles of management and organizational processes and the opportunity for skill-building in the areas of individual, interpersonal, and intergroup organizational behaviors. This is a writing intensive course.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

ORGB 320 Leadership: Theory and Practice 4.0 Credits
This course provides both a theoretical and practical understanding of leadership through theoretical and experiential learning. Course time will be devoted to lecture and course discussion that will teach students theories of leadership and hands-on activities that will demonstrate the practicality and applicability of these theories.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

ORGB 400 Team Development and Leadership 4.0 Credits
This course examines how team structures, member characteristics, and interpersonal processes influence the effectiveness of work teams, and the dynamics of interpersonal relationships within and across team boundaries. This course also examines forms and functions of team leadership to provide students with a set of general principles to help them lead teams in a range of situations. This course uses an experiential learning format; students will engage in a series of team activities, each of which will be followed by a debriefing.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

ORGB 420 Negotiations and Conflict Resolution 4.0 Credits
This course provides both a theoretical understanding of the central concepts in negotiation and conflict management through applied experience in these processes. Through classroom exercises, discussion, and personal reflection, students will improve their ability to negotiate and manage conflicts through gained confidence in these processes.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Sophomore or Senior.

ORGB 430 Strategic Career Development 4.0 Credits
This course provides a conceptual understanding of career management and a practical application of this material to the career decisions that students currently face and will face in the future. A blend of theory, case analysis, and self-assessments relate course concepts to effective techniques for managing a career at different phases of life.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

ORGB I199 Independent Study in ORGB 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ORGB I299 Independent Study in ORGB 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ORGB I399 Independent Study in ORGB 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ORGB I499 Independent Study in ORGB 1.0-4.0 Credit
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if classification is Junior or Senior.

ORGB T180 Special Topics in ORGB 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ORGB T280 Special Topics in ORGB 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ORGB T380 Special Topics in ORGB 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

ORGB T480 Special Topics in ORGB 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

Performing Arts

Courses

PRFA 100 Community Arts Performance Practicum 0-1 Credits
Provides practical experience as a participant in a Department of Performing Arts community arts initiative. Includes involvement with off campus activities with community members under faculty supervision and direction.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PRFA I199 Independent Study in Performing Arts 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PRFA I299 Independent Study in Performing Arts 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PRFA I399 Independent Study in Performing Arts 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PRFA I499 Independent Study in Performing Arts 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PRFA T180 Special Topics in Performing Arts 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PRFA T280 Special Topics in Performing Arts 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PRFA T380 Special Topics in Performing Arts 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PRFA T480 Special Topics in Performing Arts 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Philosophy

Courses

PHIL 101 Introduction to Western Philosophy 3.0 Credits
Introduces the main methods and aims of Western Philosophy, involving the study of problems central to metaphysics, theory of knowledge, and ethics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHIL 102 Introduction to Eastern Philosophy 3.0 Credits
Introduction to the main topics of study in Buddhist, Hindu and other systems of Eastern thought.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHIL 105 Critical Reasoning 3.0 Credits
Introduces and develops the skills involved in reasoning effectively about experience, and being able to distinguish strong arguments from weak ones.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHIL 107 Philosophy and Knowledge Organization 3.0 Credits
This course imparts knowledge and skills associated with organizing concepts. The context for the course is the history of knowledge organization, viewed philosophically, with special emphasis on the Platonic, Cartesian, Kantian, Comtean and Digital paradigms. Students will learn to recognize the classical principles of knowledge organization and how to apply them using a "logic of concepts." Students will also come to understand how and why knowledge is organized the way it is in the modern university.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHIL 111 Symbolic Logic I 3.0 Credits
An introduction to the fundamental concepts of symbolic logic: argument, validity, soundness, provability, completeness, consistency, decidability, entailment, logical equivalence, logical truth, logical contradiction. Covers truth-functional connectives, rules of formation and translation, and rules of inference. Proof techniques studied include natural deduction, truth-tables, and/or truth-trees.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHIL 207 Symbolic Logic II 3.0 Credits
Concentrates on syntax and semantics of quantification. Formation principles include A, E, I, and O statements (and square of opposition), domain of discourse, quantifier scope, multiple quantification, relations, and identity. Proof mechanics covered include natural deduction, instantiation, semantic tableaux, and possible-world counterexamples. Also explored are the completeness, consistency, and decidability of first-order systems.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHIL 111 [Min Grade: D]

PHIL 210 Philosophy of Sport 3.0 Credits
Studies theories about philosophical issues arising in sport, in areas including its personal, social, aesthetic, and political dimensions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHIL 211 Metaphysics: Philosophy of Reality 3.0 Credits
Studies theories about the nature of reality and philosophical issues such as the nature of time, mind, personal identity, and free will.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHIL 101 [Min Grade: D]

PHIL 212 Ancient Philosophy 3.0 Credits
Studies central works that have shaped Western Philosophy and culture from the Ancient Greek era and its legacy.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PHIL 214 Modern Philosophy 3.0 Credits
Studies central works that have shaped Western Philosophy and culture from the Renaissance through the late Nineteenth Century.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PHIL 215 Contemporary Philosophy 3.0 Credits
Studies central works that have had important impacts upon Western Philosophy and culture from the Twentieth Century through the present.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PHIL 216 Philosophy of Time 3.0 Credits
In this course we will study philosophical problems surrounding the nature of time. We will consider questions like, "Does the present exist?"; "Does time have a direction?"; "Are events pre-determined?"; "Is time travel possible?"; etc. Students will read and discuss treatments of these issues in philosophy, literature, and film.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHIL 218 Philosophy of Mathematics 3.0 Credits
This course introduces the student to a critical analysis of the fundamental concepts, principles, and assumptions of mathematics. Included will be a consideration of the reality of mathematical "objects" (numbers, sets, functions), the nature of mathematical knowledge, the relationship between logic and mathematics, and other topics which may include the discussion of mathematical concepts of continuity and infinity.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHIL 221 Epistemology: Philosophy of Knowledge 3.0 Credits
Studies theories about knowledge that bear upon philosophical issues concerned with the nature and status of knowledge claims as expressed in concepts like belief, truth, and justification.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHIL 101 [Min Grade: D]

PHIL 231 Aesthetics: Philosophy of Art 3.0 Credits
Studies theories about art and the nature of beauty that bear on philosophical issues concerned with artistic production, performance, and perception, such as arise in activities like painting, sculpture, film literature, music, and dance.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PHIL 241 Social & Political Philosophy 3.0 Credits
Studies theories about human social and political life that bear on philosophical issues such as the nature and scope of justice, the legitimacy of states, and the relationship between democracy, civil rights, and civil disobedience.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHIL 251 Ethics 3.0 Credits
Studies theories about human conduct which bear upon the rightness and wrongness of actions, and the goodness and badness of ends, including the nature, scope, purposes, and varieties of moral and ethical theories.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHIL 255 Philosophy of Sex & Love 3.0 Credits
This course investigates sexual activity and desire, and the morality of sexual behavior. It also examines various types of love and their links with sexuality. Figures studied include Plato, Aristotle, Augustine, Aquinas, Kant, Kierkegaard, Freud and Foucault. Topics include marriage, prostitution, pornography, homosexuality, perversion, rape, intentionality, irreplaceability, unconditionality, reciprocity, and exclusivity.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHIL 291 Judaism and Christianity: Two Religions or One? 3.0 Credits
The relation between Christianity and Judaism is one of the most misunderstood in the history of thought. Christianity is often considered to be diametrically opposed to Judaism, to be a rejection of the Judaic worldview. Indeed, prominent thinkers in the history of Christianity, such as Martin Luther, have reinforced this position. Yet Christianity was originally a development within Judaism, a sect, so to speak, of Judaism. The earliest Christians were Jewish followers of a Jewish leader and conceived of themselves as faithful Jews. So how did the two religions come to be viewed as opposed? Do elements of Judaism remain as part of the foundation of the new faith of Christianity? Where do the two faiths converge and where do they diverge? This course endeavors to answer these important questions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHIL 301 Business Ethics 3.0 Credits
Study of such moral issues as truth-telling, puffery, and lying in business communications; employer-employee relations; obligations to customers; obligations to foreign populations; and government contracts.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PHIL 305 Ethics and the Media 3.0 Credits
Ethical analysis of current laws and legislation aimed at regulating speech in the context of mass communications (radio, television and film).
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PHIL 311 Ethics and Information Technology 3.0 Credits
Ethical analyses of current laws and pending legislation aimed at regulating computer use as well as Internet practices and content.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PHIL 315 Engineering Ethics 3.0 Credits
Provides critical reflection on the nature of engineering and technology and on the ethical obligations and responsibilities unique to the engineering profession. Topics include the social responsibilities of engineering, the nature of professionalism, professional autonomy, whistleblowing, conflicts of interest, organizational (dis)obedience, the ethics of risk assessment, and the place and purpose of engineering codes of ethics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is BUSN or major is ECON or classification is Freshman

PHIL 317 Ethics and Design Professions 3.0 Credits
Examines ethical theories and their application to architecture; the ethics of architectural space and place; the logic of ethical reasoning applied to the practice of architecture; professional ethics and the social responsibility of architects; the ethics of safety and risk in the production of architectural structures; sustainable environmental architectural design.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ARCH or major is INTR.

PHIL 321 Biomedical Ethics 3.0 Credits
Studies moral issues related to health and disease, patients' rights and professional responsibilities, informed consent, abortion, euthanasia, and biomedical research.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHIL 322 Ethics of Human Enhancement 3.0 Credits
Discussion of developments in health-care with the potential not only to treat disease, but also to improve human performance and cosmetically change the human body, thereby creating ethical considerations about the nature of health and disease and the proper scope and goals of health care.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: HSAD 210 [Min Grade: D] or PHIL 251 [Min Grade: D]

PHIL 323 Organizational Ethics 3.0 Credits
This course focuses on the application of ethical theories and principles to organizational systems and decision-making. Emphasis will be placed on how ethical principles affect and are applied to organizational policy-making, leadership behavior, systems of communication, technology use, and other systems of organization.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Pre-Junior or Senior.

PHIL 325 Ethics in Sports Management 3.0 Credits
An introduction to various ethical issues in sports and sports management, such as leadership and coaching; gender and racial equity in sports; fair play and cheating; violence and competition; commercialization of sports; the relation of sports to cultural value systems; ethics of technology and sports performance.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

PHIL 330 Criminal Justice Ethics 3.0 Credits
Studies ethical issues in the policies and practices of criminal justice, and theories that bear upon issues such as the relationship of law to justice, the definition of crime, the use of deception and coercion in law enforcement, and the purposes and varieties of criminal punishment.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PHIL 335 Global Ethical Issues 3.0 Credits
Offers an introduction to the ethical tensions of our age, globally construed. May address such issues as terrorism, genocide, religious exclusivism, nuclear proliferation, the regulation of the Internet, as well as culturally competing notions of right and wrong, and good and bad.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PHIL 340 Environmental Ethics 3.0 Credits
This course examines ethical questions about human relations with the nonhuman world. These questions will be informed by assessing sustainable practices, indigenous ways of life, environmental movements, and such issues as biodiversity loss and global climate change.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHIL 341 Environmental Philosophy 3.0 Credits
Studies ecological issues from a philosophical standpoint stressing the implications of scientific and technological developments as they affect people's lives and choices.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PHIL 351 Philosophy of Technology 3.0 Credits
Studies technology from a philosophical standpoint stressing its role in shaping human existence and values, considering issues such as the control and distribution of information, housing and city planning, automation, and the uses of technology in medicine.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PHIL 355 Philosophy of Medicine 3.0 Credits
Examines the ideas of medicine, disease, and health from a philosophical perspective. Examines such concepts as gender, mental-illness, mind-body unity, aging and physical perfection as derived from both Eastern and Western traditions. Current health policy alternative treatment practices are also discussed.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PHIL 361 Philosophy of Science 3.0 Credits
Studies natural scientific theory-construction and investigative methods from a philosophical standpoint, considering issues such as the nature and scope of experimental method, and the history and justification of theory change.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHIL 101 [Min Grade: D] or PHIL 102 [Min Grade: D] or PHIL 105 [Min Grade: D] or PHIL 107 [Min Grade: D] or PHIL 111 [Min Grade: D]

PHIL 381 [WI] Philosophy in Literature 3.0 Credits
Studies philosophical issues such as the concept of the self, the nature and course of evil, the nature and scope of free will, and ideals in living as they appear in significant works of literature.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PHIL 385 Philosophy of Law 3.0 Credits
This course addresses philosophical issues in the law. Topics include the meaning of "law," the nature and logic of legal (in contrast to moral) concepts and principles, and competing conceptions of law (Natural Law, Positivism, Realism, Rights-Based, etc.). Authors may include Plato, Mill, Rawls, Hart, Dworkin and others.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PHIL 391 Philosophy of Religion 3.0 Credits
Studies various aspects of religious belief and experience from a philosophical standpoint, considering issues such as the definition and existence of God, the nature and course of evil, and the relationship between faith and reason in a religious life.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PHIL 421 [WI] Seminar in Ancient Philosophy 3.0 Credits
Advanced study and discussion of the works of the leading philosophers and philosophical schools of Western antiquity. Reading and Writing Intensive.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore
Prerequisites: (PHIL 211 [Min Grade: D] or PHIL 212 [Min Grade: D] or PHIL 214 [Min Grade: D] or PHIL 215 [Min Grade: D]) and (PHIL 221 [Min Grade: D] or PHIL 231 [Min Grade: D] or PHIL 241 [Min Grade: D] or PHIL 251 [Min Grade: D])

PHIL 431 [WI] Seminar in Modern Philosophy 3.0 Credits
Advanced study and discussion of the works of the leading philosophers and philosophical schools of the Modern period (circa. 1500 A.D. to 1900 A.D.) on the European Continent and British Isles. Reading and Writing Intensive.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore
Prerequisites: (PHIL 221 [Min Grade: D] or PHIL 231 [Min Grade: D] or PHIL 241 [Min Grade: D] or PHIL 251 [Min Grade: D]) and (PHIL 211 [Min Grade: D] or PHIL 212 [Min Grade: D] or PHIL 214 [Min Grade: D] or PHIL 215 [Min Grade: D])

PHIL 461 [WI] Seminar in Contemporary Philosophy 3.0 Credits
Advanced study and discussion of the works by leading philosophers from 1900 to present. Reading and Writing Intensive.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore
Prerequisites: (PHIL 211 [Min Grade: D] or PHIL 212 [Min Grade: D] or PHIL 214 [Min Grade: D] or PHIL 215 [Min Grade: D]) and (PHIL 221 [Min Grade: D] or PHIL 231 [Min Grade: D] or PHIL 241 [Min Grade: D] or PHIL 251 [Min Grade: D])

PHIL 481 [WI] Seminar in a Philosophical School 3.0 Credits
Development of doctrines, theories, arguments and problems associated with one or more philosophical schools (or movements). Schools (or movements) may include Pythagoreanism, Platonism, Epicureanism, or recently, Positivism, Pragmatism, and Existentialism. This course is Reading and Writing Intensive.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (PHIL 211 [Min Grade: D] or PHIL 212 [Min Grade: D] or PHIL 214 [Min Grade: D] or PHIL 215 [Min Grade: D]) and (PHIL 221 [Min Grade: D] or PHIL 231 [Min Grade: D] or PHIL 241 [Min Grade: D] or PHIL 251 [Min Grade: D])

PHIL 485 [WI] Seminar in a Major Philosopher 3.0 Credits
Study of the works of a major philosopher such as Plato, Aristotle, Descartes, Locke, Hume, Kant, etc. Reading and Writing Intensive.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (PHIL 211 [Min Grade: D] or PHIL 212 [Min Grade: D] or PHIL 214 [Min Grade: D] or PHIL 215 [Min Grade: D]) and (PHIL 221 [Min Grade: D] or PHIL 231 [Min Grade: D] or PHIL 241 [Min Grade: D] or PHIL 251 [Min Grade: D])

PHIL 497 [WI] Senior Essay I: Research & Thesis Development 3.0 Credits
Individual supervision. Selection of research topic for the senior argumentative essay; collection and analysis of hard-copy and electronic research material; construction of bibliography. Initial thesis formulation and drafting of argument sketch. Writing Intensive.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PHIL and classification is Senior.

PHIL 498 [WI] Senior Essay II: Argument Construction 3.0 Credits
Supervised construction of the main and supporting arguments of the senior essay involving drafting and re-drafting of the prose statement. Writing Intensive.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PHIL and classification is Senior.
Prerequisites: PHIL 497 [Min Grade: D]

PHIL 499 [WI] Senior Essay III: Defense 3.0 Credits
Individual Supervision. Defense of the senior essay thesis before the philosophy faculty and fellow senior philosophy majors. Written replies to main criticisms as determined by the faculty supervisor. Final submission of senior essay. Writing Intensive.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PHIL and classification is Senior.
Prerequisites: PHIL 498 [Min Grade: D]

PHIL I199 Independent Study in PHIL 1.0-12.0 Credit
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PHIL I299 Independent Study in PHIL 1.0-12.0 Credit
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PHIL I399 Independent Study in PHIL 1.0-12.0 Credit
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PHIL I499 Independent Study in PHIL 1.0-12.0 Credit
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PHIL T180 Special Topics in Philosophy 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PHIL T280 Special Topics in Philosophy 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PHIL T380 Special Topics in Philosophy 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PHIL T480 Special Topics in Philosophy 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Philosophy, Politics and Economics

Courses

PPE 101 Introduction to Philosophy, Politics and Economics 3.0 Credits
This course introduces the interdisciplinary major Philosophy, Politics and Economics in two ways: it examines ways of thinking, speaking and researching in each of the three component disciplines, and it applies these overlapping approaches to a set of complex real-world problems.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PPE 450 Senior Seminar in Philosophy, Politics and Economics 4.0 Credits
In this capstone seminar course students will use the tools of philosophy, political science, and economics to construct arguments in evaluating and criticizing proposals, methods, and explanations in the three fields, drawing upon each as appropriate. Topics for each term will be chosen by the instructor and may include proposals or instances of public policy, economics, or politics, or particular perspectives, theories, or methods drawn from any of the three fields.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: PPE 101 [Min Grade: C]

Photography

Courses

PHTO 110 Photography 3.0 Credits
Lecture-laboratory course in black and white photography. With a combination of lectures, assignments and group critiques, students learn to see photographically through an exploration of the basic tools, techniques and aesthetics of photography. For PHTO Majors, a manual 35mm film camera is required. For PHTO Minors & non-majors a digital point and shoot camera or DSLR, 16 megapixels or greater is required. Cameras that are capable of shooting in RAW format are strongly recommended.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

PHTO 140 Digital Photography I 4.0 Credits
The objective of this course is to give you an introduction to the technical skills necessary to use computers, equipment, and software as a means of visually communicating your photographic ideas.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHTO 110 [Min Grade: D]

PHTO 141 Digital Photographic Post Production 3.0 Credits
This course is an introduction to the manipulation and output of files using Photoshop and Lightroom. Skills acquired include working with RAW files, density, contrast and color correction, basic retouching, compositing of image, type and color elements along with special effects and output via inkjet printer. A digital point and shoot camera or DSLR, 16 megapixels or greater is required that is capable of shooting in RAW file format.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

PHTO 210 Intermediate Photography 3.0 Credits
Continues the aesthetic and technical investigations of black and white photography begun in PHTO 110 through a mix of lectures, slide discussions, analytical and creative projects, and group critiques. For PHTO Majors, a manual 35mm film camera is required. For PHTO Minors & non-majors a digital point and shoot camera or DSLR, 16 megapixels or higher is required. Cameras that are capable of shooting in RAW format are strongly recommended.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHTO 110 [Min Grade: D]

PHTO 230 Color Photography for Non-Majors 3.0 Credits
This course will introduce students to the foundations of color photography. It is a lecture-laboratory course that combines the visual, technical, and communicative properties of color photography with comprehensive color digital workflow experience. Students will begin to master the techniques of properly color balancing their prints and develop a sense of how to use color. It is important to grasp the foundations of color photography, but it is equally important to understand the aesthetic implications that using color entails.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHTO 210 [Min Grade: D]

PHTO 231 Color Photography 4.0 Credits
An introduction to the aesthetics and technology of color photography. There is an emphasis on color composition and theory. Class includes a variety of color processes, utilizing analog/film and digital materials.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHTO 210 [Min Grade: D] or PHTO 140 [Min Grade: D] or PHTO 240 [Min Grade: D]

PHTO 233 Large Format Photography 4.0 Credits
Provides a thorough exploration of large-format camera techniques and large-format film exposure/development techniques including the zone system. Introduces the aesthetic of the large-format black-and-white photograph and expands the student's vision of the potential of the photographic image.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHTO 210 [Min Grade: D]

PHTO 234 Studio Photography 4.0 Credits
Introduces professional studio photography practices. Continues utilization of the digital camera. Examines artifical lighting techniques and provides context for exploration of the studio as a creative photographic environment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHTO 110 [Min Grade: D]

PHTO 236 Photojournalism 4.0 Credits
Approaches the subject of photojournalism through lectures on its history and current practices and through application. Considers the documentary genre of photography in general.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHTO 210 [Min Grade: D] or PHTO 240 [Min Grade: D] or PHTO 140 [Min Grade: D]

PHTO 240 Digital Photography II 4.0 Credits
Explores the digital image within the context of photographic practice. Examines current capabilities and future potentials in image capture, manipulation, output, and dissemination. Projects include utilization of image-manipulation programs, direct digital cameras, and hybrid film/digital approaches. Addresses aesthetic, conceptual, and professional issues.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHTO 210 [Min Grade: D] or PHTO 140 [Min Grade: D]

PHTO 253 Fine Black & White Printing 3.0 Credits
Explores the aesthetic of the fine black-and-white print, including issues of print scale, tonality, surface quality, toning, and archival techniques. Uses zone-system analysis to optimize the relationship of the negative and the print.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHTO 210 [Min Grade: D]

PHTO 275 [WI] History of Photography I 3.0 Credits
Provides an overview of the history of photography from 1839 to approximately 1930, including technological developments, aesthetic trends, theoretical and philosophical understandings, and effects on society and culture at large. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ARTH 101 [Min Grade: D]

PHTO 276 [WI] History of Photography II 3.0 Credits
Provides an overview of the history of photography from approximately 1930 to the present, including technological developments, aesthetic trends, theoretical and philosophical understandings, and effects on society and culture at large.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHTO 275 [Min Grade: D]

PHTO 291 Internship 0.5-12.0 Credits
Incorporates a nonpaying internship in the field of photography for academic credit. An initial informational sheet on the internship and a final paper on the experience are required. May be repeated for credit. Department permission required.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if major is PHTO.

PHTO 334 Advanced Studio Photography 4.0 Credits
An advanced studio photography class that will teach the student the workflow associated with high-end digital studio capture. The class will also cover various advanced studio lighting techniques. The development of a personal portfolio of work produced in the studio will be required by all students.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PHTO.
Prerequisites: PHTO 234 [Min Grade: D]

PHTO 335 Portraiture 3.0 Credits
This course is devoted to the development of a single project. The course will deal in depth with issues of format, lighting and composition. The course will address ethical and legal matters in photographic portraiture. An overview of the history of photographic portrait will be covered.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PHTO.
Prerequisites: PHTO 231 [Min Grade: D] and PHTO 233 [Min Grade: D] and PHTO 236 [Min Grade: D] and PHTO 253 [Min Grade: D]

PHTO 336 Assignment Photography 3.0 Credits
Assignment is simply said to be photography that supports the written word, which may be either news or advertising, article photographs, advertisements, or the cover of a magazine. The purpose of this course is to teach students how to stand out from the photographic crowd by injecting personal style.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 1 times for 6 credits
Restrictions: Can enroll if major is PHTO and classification is Junior or Pre-Junior or Senior.
Prerequisites: PHTO 234 [Min Grade: D] and PHTO 334 [Min Grade: D]

PHTO 340 Digital Photography III 4.0 Credits
This class will build on intermediate Photoshop skills while exploring the new field of building a photographic image by using more than one frame or multiple elements. Students will be expected to produce a body of work using the skills learned. Large format printing will be stressed.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PHTO and classification is Junior or Senior.
Prerequisites: PHTO 140 [Min Grade: D] and PHTO 240 [Min Grade: D]

PHTO 361 Advanced Photography 4.0 Credits
Extends study and experimentation in studio, color, and historical photography. Examines non-silver and non-traditional photographic technologies.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PHTO.
Prerequisites: PHTO 233 [Min Grade: D] and PHTO 253 [Min Grade: D]

PHTO 392 Junior Project in Photography 3.0 Credits
Integrates the technical and conceptual understandings that the student has acquired in photography through development of a personally defined photographic project. Students will meet in weekly seminars to plan, discuss, and critique in-progress work.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PHTO and classification is Junior.
Prerequisites: PHTO 234 [Min Grade: D]

PHTO 399 Independent Study In Photography 0.5-12.0 Credits
Provides individualized study in photography in a specialized area. May be repeated for credit. Department permission required.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if major is PHTO.

PHTO 451 Photography and Business 3.0 Credits
Seminar course with invited professionals from the photographic and business fields. Helps prospective photographers understand legal aspects of photography, freelance business practices, and potential employment possibilities and expectations.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHTO 240 [Min Grade: D]

PHTO 452 [WI] History of Contemporary Photography 3.0 Credits
The course will focus on aesthetic and conceptual development in contemporary photographic practice. Through lectures, field trips and in-class discussions, students will learn concepts and visual trends employed in photography since 1970. Topics covered include 19th and 20th century influences, multi-cultural interpretation of genres, new approaches to representation of self.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHTO 275 [Min Grade: D] and PHTO 276 [Min Grade: D]

PHTO 453 Photography Production 3.0 Credits
The objective of this course is to introduce prospective photographers to commercial production practices. Topics covered will include the definition and marketing of personal style, the varied roles of vendors and clients, interpreting layouts and concepts, and approaches to commercial production.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PHTO and classification is Senior.
Prerequisites: PHTO 451 [Min Grade: D]

PHTO 455 Landscape Photography 3.0 Credits
This class is designed to explore the rich tradition and history of the landscape photograph and how to visually translate the contemporary landscape.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if major is PHTO and classification is Junior or Senior.
Prerequisites: PHTO 233 [Min Grade: D]

PHTO 456 Fashion Photography 3.0 Credits
The objective of this course is for students to become familiar with both the aesthetics and techniques involved in the production of fashion photographs. In addition, the history of fashion photography will be covered.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PHTO and classification is Junior or Senior.
Prerequisites: PHTO 234 [Min Grade: D] and PHTO 334 [Min Grade: D]

PHTO 457 Palladium Printing 3.0 Credits
This class explores the technical and aesthetic aspects of the 19th century, hand-coated palladium and platinum printing processes. Students will use large format negatives to produce a body of work. This course will include hand-coating techniques, paper and chemistry options.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PHTO and classification is Junior or Senior.
Prerequisites: PHTO 233 [Min Grade: D] and PHTO 361 [Min Grade: D]

PHTO 458 Advertising Portfolio Development 3.0 Credits
This course is designed to prepare students to enter the commercial market. Topics covered will include the definition and marketing of personal visual style, identity and cohesion, and contemporary self-promotion practices.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PHTO and classification is Senior.
Prerequisites: PHTO 451 [Min Grade: D] and PHTO 453 [Min Grade: D]

PHTO 459 Marketing for Photographers 3.0 Credits
The objective of this course is to give students practical skills about marketing, design, and production of materials you will need as a photographer. Discussions and demonstrations will show you how to use print, web, and other technologies to promote your photography.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PHTO and classification is Junior or Senior.
Prerequisites: PHTO 451 [Min Grade: D]

PHTO 492 Senior Thesis in Photography I 3.0 Credits
Integrates the technical and conceptual understandings that the student has acquired in photography through development of a personally defined photographic project. Students will meet in weekly seminars to plan, discuss, and critique in-progress work.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHTO 392 [Min Grade: D]

PHTO 493 Senior Thesis in Photography II 3.0 Credits
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PHTO 492 [Min Grade: D]

PHTO 495 Senior Thesis in Photography III 3.0 Credits
Integrates the technical and conceptual understandings that the student has acquired in photography through development of a personally defined photographic project. Students will meet in weekly seminars to plan, discuss, and critique in-progress work.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PHTO and classification is Senior.
Prerequisites: PHTO 492 [Min Grade: D] and PHTO 493 [Min Grade: D]

PHTO I199 Independent Study in Photography 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PHTO I299 Independent Study in Photography 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

PHTO I399 Independent Study in Photography 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PHTO I499 Independent Study in PHTO 0.0-12.0 Credits
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PHTO T180 Special Topics in Photography 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PHTO T280 Special Topics in Photography 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PHTO T380 Special Topics in Photography 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PHTO T480 Special Topics in Photography 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Physics

Courses

PHYS 050 Preparation for Engineering Studies 0.0 Credits
PHYS-050 is a self-paced online course and is intended for students who need additional preparation in mathematics and physics to be successful in the beginning physics courses (PHYS-101, 102). The online course is divided into six UNITS : Simultaneous Equations, Fundamentals of Plane Geometry, Use of Trigonometric Functions, Fundamentals of Solid geometry Vectors, and Kinematics. Each UNIT is organized in four sections: [i] Introduction; [ii] Interactive Problems; [iii] Sample Problems; and [iv]Tests.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PHYS 100 Preparation for Engineering Studies 4.0 Credits
This is a basic mathematics foundational course to prepare the students for the beginning sequence of Engineering Physics. Topics include: simultaneous equations, fundamentals of plane and solid geometry, use of trigonometric functions and vectors and translational kinematics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: EXAM 080

PHYS 101 Fundamentals of Physics I 4.0 Credits
First of a four course sequence teaching fundamental physics to engineering and science majors. Topics include: description of motion, inertial and non-inertial frames, special relativity, Newton's Laws, translational and rotational equilibrium, one- and two-dimensional motion, fundamental forces, inverse square laws, Gauss' Law, Bohr's quantization, rotational dynamics, potential energy, black holes, determinism and chaos.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: (PHYS 050 [Min Grade: CR] or PHYS 100 [Min Grade: D] or APC 070) and (MATH 121 [Min Grade: C-] or MATH 117 [Min Grade: C-])
Corequisite: EXAM 080

PHYS 102 Fundamentals of Physics II 4.0 Credits
Second of a four course sequence teaching fundamental physics to engineering and science majors. Topics include: electrostatics, capacitors, charges in motion, insulators, semiconductors, conductors, superconductors, voltage and current measurements, magnetism, electromagnetic induction, magnetic materials, quantum dots, magnetic resonance phenomenon.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 101 [Min Grade: D]
Corequisite: EXAM 080

PHYS 103 General Physics I 0.0-4.0 Credits
Algebra-based course that covers force, motion, work, energy properties of matter, and wave motion and sound propagation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHYS 104 General Physics II 0.0-4.0 Credits
Algebra-based course that covers electricity and applications, magnetism, and optics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 103 [Min Grade: D]

PHYS 105 Computational Physics I 3.0 Credits
Introduces computational physics. Covers analytical and numerical solutions of equations governing the behavior of physical systems. Includes the use of C/C++ and Python programming methods to solve selected problems. Introduces UNIX, X-windows, programming languages, and visualization and data analysis tools for problems in computational physics. Introduces elementary programming concepts as needed.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: (PHYS 113 [Min Grade: D] or PHYS 101 [Min Grade: D]) and CS 171 [Min Grade: D]

PHYS 106 [WI] The Physics of High Fidelity 3.0 Credits
Applies physical principles to understanding how hi-fi systems work. Includes consumer education in selecting components. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHYS 107 Acoustics 3.0 Credits
Covers the theory describing sound, behavior and sound waves, resonance and harmonics, frequency analysis, electronic production of sound, sound perception by the human ear, sound recording and reproduction, and room acoustics. Emphasis will be placed on understanding how sound operates in the physical world and how our ears respond to it.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHYS 113 Contemporary Physics I 5.0 Credits
Part I in an introductory physics sequence for majors. This course combines the traditional lecture/lab format with real-time numerical simulations designed by the students. Topics include: the fundamental forces, Newton's laws, the atomic nature of matter, work and energy, light, friction, and atomic nuclei.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: MATH 121

PHYS 114 Contemporary Physics II 5.0 Credits
Part II in an introductory sequence for majors. This course combines the traditional lecture/lab format with real-time numerical simulations designed by the students. Topics include: angular momentum, entropy, gas dynamics, electric fields, electricity and matter, and electric potential.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 113 [Min Grade: D]
Corequisite: MATH 122

PHYS 115 Contemporary Physics III 5.0 Credits
Part III in an introductory sequence for majors. This course combines the traditional lecture/lab format with real-time numerical simulation designed by the students. Topics include: magnetic fields, electronics, radiation, waves and particles, and an introduction to semiconductor devices.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 114 [Min Grade: D]

PHYS 121 Physical Science for Design I 0.0-4.0 Credits
Offers a non-calculus-based survey of physical science for students in design and the visual arts. Topics include kinematics in two dimensions, forces, Newton's laws, applications using the constant acceleration model, energy, momentum, conservation laws, universal gravitation, circular motion, satellites, oscillatory motion, wave motion, sound, and music.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: EXAM 080

PHYS 122 Physical Science for Design II 0.0-4.0 Credits
Continues PHYS 121. Topics include electricity, magnetism, em waves, light, geometrical and physical optics, anatomic structure, the elements, and nuclear decay and nuclear energy.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 121 [Min Grade: D]
Corequisite: EXAM 080

PHYS 128 Introduction to Experimental Physics 3.0 Credits
This course will give students an introduction to all aspects of experimental physics, including experiment theory, laboratory techniques, data analysis, scientific writing, literature research, and presentations. Students are required to perform experiments in physics, such as the Millikan oil-drop experiment, the photoelectric effect measurement, the Michelson interferometer experiment, and radioactivity and spectroscopy measurements. Students are also required to write detailed laboratory reports and give an oral presentation. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 113 [Min Grade: D] (Can be taken Concurrently)

PHYS 131 Survey of the Universe 3.0 Credits
Provides an overview of modern astronomy, including the scientific method; telescopes; stars and star clusters; stellar evolution; galaxies and the large-scale structure of the universe; and the Big Bang. May also include periodic visits to the university observatory.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHYS 135 How Things Work 4.0 Credits
This course examines the science behind everyday phenomena and devices. It uses real-world applications such as amusement park rides, microwave ovens, photocopiers, CDs, MRI, etc., as contextual vehicles to convey principles of classical and modern physics. It emphasizes conceptual understanding and uses pedagogy such as lecture demonstrations and active feedback.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHYS 151 Applied Physics 0.0-3.0 Credits
Non-calculus-based introductory physics for business majors. Covers basic mechanics and simple harmonic motion, followed by an introduction to more advanced topics such as relativity, electromagnetism, and quantum phenomena.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: EXAM 081

PHYS 152 Introductory Physics I 4.0 Credits
First part of a three-course algebra-based sequence providing a comprehensive introduction to Physics. Covers basic mechanics, including motion in 1, 2, and 3 Newton's laws, gravitation, energy, momentum, rotational motion and elastic properties of materials. Includes labs to enrich class material. High school physics not required.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: EXAM 081

PHYS 153 Introductory Physics II 4.0 Credits
Second part of a three-course algebra-based sequence providing a comprehensive introduction to Physics. Covers fluids, vibrations, waves, sound, heat and thermodynamics, geometrical optics and optical instrumentation. Includes labs to enrich class material.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 152 [Min Grade: D] or PHYS 101 [Min Grade: D]
Corequisite: EXAM 081

PHYS 154 Introductory Physics III 4.0 Credits
Third part of a three-course algebra-based sequence providing a comprehensive introduction to Physics. Covers fundamentals of electricity and magnetism, including charges, fields, potential, circuits, magnetic induction, electromagnetic waves, special relativity, and physical optics. Includes labs to enrich class material.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 101 [Min Grade: D] or PHYS 152 [Min Grade: D]
Corequisite: EXAM 081

PHYS 160 Introduction to Scientific Computing 3.0 Credits
Basic introduction to scientific problem solving and numerical modeling of physical system using Excel and Maple.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHYS 170 Electricity and Motion 3.0 Credits
With an interactive lecture format and an inquiry-based student-centered recitation, "Electricity and Motion" will give a conceptual introduction to topics in physics such as motion, forces, electricity, and magnetism. Students will complete an interdisciplinary, real-world project that will relate their specific major to an area of physics. Students will also be able to solve one-step algebra problems and conceptually describe topics in physics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHYS 171 Computational Lab for Electricity and Motion 1.0 Credit
Students will experiment with computational methods as they relate to physics topics such as motion, forces, electricity, and magnetism using tools such as Excel, Python, code.org, and Blockscad.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: PHYS 170

PHYS 172 Experimental Lab for Electricity and Motion 1.0 Credit
Students will experiment with real world materials as they relate to physics topics such as motion, forces, electricity, and magnetism.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: PHYS 170

PHYS 175 Light and Sound 3.0 Credits
With an interactive lecture format and an inquiry-based student-centered recitation, this course will give a conceptual introduction to topics in physics such as waves, sound, light, and color. Students will complete an interdisciplinary, real-world project that will relate their specific major to an area of physics. Students will also be able to solve one-step algebra problems and conceptually describe topics in physics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHYS 176 Computational Lab for Light and Sound 1.0 Credit
Students will experiment with computational methods as they relate to physics topics such as waves, sound, light, and color using tools such as Excel, Python, code.org, and Blockscad.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: PHYS 175

PHYS 177 Experimental Lab for Light and Sound 1.0 Credit
Students will experiment with real world materials as they relate to physics topics such as waves, sound, light, and color.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Corequisite: PHYS 175

PHYS 181 Astronomy 3.0 Credits
Provides an overview of modern astronomy, including the scientific method; telescopes; stars and star clusters; stellar evolution; galaxies and the large-scale structure of the universe; and the Big Bang. May also include periodic visits to the university observatory.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHYS 182 Applied Physics I 3.0 Credits
Covers vectors; statics, kinematics, and classical dynamics, including Newton's laws, torque, projectile motion, and circular motion; work; power and energy; impulse and momentum; and rotation, in a non-calculus-based course. Fall.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 183 [Min Grade: D] or MATH 101 [Min Grade: D] or MATH 102 [Min Grade: D] or MATH 173 [Min Grade: D]

PHYS 183 Applied Physics II 3.0 Credits
Covers fluids; elasticity; vibration, including simple harmonic motion; sound waves and acoustics; thermodynamics of temperature; heat; thermal-expansion; phase change; and heat transfer, in a non-calculus-based course. Winter.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHYS 182 [Min Grade: D]

PHYS 184 Applied Physics III 3.0 Credits
Covers light and illumination, electrostatics, potential, direct-current electrical circuits, magnetic fields, induction, generators, motors, and AC circuits, in a non-calculus-based course. Spring.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHYS 183 [Min Grade: D]

PHYS 185 Fundamentals of Physics Lecture I 3.0 Credits
First of a three course sequence teaching fundamental physics to engineering and science majors. Topics include: description of motion, inertial and non-inertial frames, special relativity, Newton's Laws, translational and rotational equilibrium, one- and two-dimensional motion, fundamental forces, inverse square laws, Gauss' Law, Bohr's quantization, rotational dynamics, potential energy, black holes, determinism and chaos.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 121 [Min Grade: D]

PHYS 186 Physics I-A 1.0 Credit
A companion course for PHYS 185. Students will perform experiments related to Mechanics. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 185 [Min Grade: D] (Can be taken Concurrently)

PHYS 188 Physics II-A 1.0 Credit
A companion course for PHYS 189. Students will perform experiments related to Electricity and Magnetism. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 189 [Min Grade: D] (Can be taken Concurrently)

PHYS 189 Fundamentals of Physics Lecture II 3.0 Credits
Second of a four course sequence teaching fundamental physics to engineering and science majors. Topics include: electrostatics, capacitors, charges in motion, insulators, semiconductors, voltage and current measurements, magnetism, electromagnetic induction, magnetic materials, quantum dots, magnetic resonance phenomenon.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 185 [Min Grade: D]

PHYS 201 Fundamentals of Physics III 4.0 Credits
Third of a four course sequence teaching fundamental physics to engineering and science majors. Topics include: oscillations, EM waves, interference, diffraction, wave-particle duality, energy-matter equivalence, uncertainty relations, Schrodinger's equation, Hydrogen atom, laser, and nuclear physics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 102 [Min Grade: D] and MATH 122 [Min Grade: D]
Corequisite: EXAM 081

PHYS 217 Thermodynamics 4.0 Credits
Covers macro-thermodynamics: temperature, pressure, work, heat, equations of state, the first and second laws of thermodynamics and their applications, heat engines and refrigerators, thermodynamics potentials, Maxwell relations, theory of phase changes, kinetic theory and transport phenomena.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 114 [Min Grade: D] or PHYS 102 [Min Grade: D]

PHYS 226 Instrumentation for Scientists I 3.0 Credits
Introduces measurement concepts, including a systems approach to analog and digital measurement, amplification and feedback, electrical data domains, measurements of varying analog signals, time domain measurements and conversions, and A/D and D/A conversions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PHYS 227 Instrumentation for Scientists II 3.0 Credits
Covers optimization of scientific measurements, including systems analysis, signal/noise, control of frequency response, modulation and demodulation, relation of sampling parameters to signal characteristics, and signal-to-noise ratio enhancement.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHYS 226 [Min Grade: D]

PHYS 231 Introductory Astrophysics 3.0 Credits
An introductory astrophysics course aimed at science majors. Topics include a treatment of orbits, Kepler's laws, celestial coordinates, light, blackbodies, optics, stellar structure and evolution, galactic formation, and large scale evolution and structure of the universe.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (PHYS 101 [Min Grade: D] or PHYS 113 [Min Grade: D]) and MATH 121 [Min Grade: D]

PHYS 232 Observational Astrophysics 3.0 Credits
Covers photometric and spectroscopic properties of stars, galaxies, and quasars and fundamental astrophysics of these objects. The course contains a significant lab component, which includes training in methods of observation, using the Joseph Lynch Observatory on campus to obtain astronomical measurements, and analysis of data.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHYS 113 [Min Grade: D] and MATH 121 [Min Grade: D]

PHYS 233 Introduction to Relativity 3.0 Credits
This course covers foundational concepts in Einstein's Special Theory of Relativity, including the unification of space-time, transformations between inertial frames, relativity of simultaneity, length contraction and time dilation, and transformation between energy and momentum. Introductory concepts in General Relativity will be discussed, including space curvature and weak gravitational fields.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: (PHYS 113 [Min Grade: D] or PHYS 101 [Min Grade: D]) and MATH 122 [Min Grade: D]

PHYS 262 Introduction to Biophysics 3.0 Credits
This is an introductory course to the wide field of Biophysics. The intended audience is undergraduate physics majors. However, the level and approach is also accessible to undergraduates from other concentrations, including Chemistry and Biology. Students will learn the basic principles behind cells, thermodynamics and statistical mechanics applied to cellular environments, forces affecting conformation of biological molecules, protein and nucleic acid biophysics, membrane biophysics, and basic physics principles behind nerve impulses.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: (PHYS 115 [Min Grade: D] or PHYS 201 [Min Grade: D])

PHYS 280 Fundamentals of Physics Lecture III 3.0 Credits
Third of a three course sequence teaching fundamental physics to engineering and science majors. Topics include: oscillations, EM waves, interference, diffraction, wave-particle duality, energy-matter equivalence, uncertainty relations, Schrodinger's equation, Hydrogen atom, laser, and nuclear physics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 102 [Min Grade: D] or PHYS 189 [Min Grade: D]

PHYS 282 Fundamentals of Physics Laboratory III 1.0 Credit
A companion course for PHYS 280. Students will perform experiments related to Thermodynamics and modern physics. Some or all pre-requisites may be taken as either a pre-requisite or co-requisite. Please see the department for more information.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 280 [Min Grade: D] (Can be taken Concurrently)

PHYS 305 Computational Physics II 3.0 Credits
Covers the application of computational techniques to problems in physics, including numerical solution of differential equations, computation and display of particle trajectories in arbitrary potentials, introduction to non-linear dynamics, random numbers and Monte-Carlo methods, and numerical implementation of selected methods in mathematical physics. Emphasizes hands-on experience in problem-solving, using both Maple and C.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHYS 105 [Min Grade: D] and CS 171 [Min Grade: D]

PHYS 311 Classical Mechanics I 4.0 Credits
An intermediate treatment of classical mechanics and dynamics. Topics will include central forces, oscillatory motion, Lagrangian and Hamiltonian mechanics, phase space, and collisions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 210 [Min Grade: D] (Can be taken Concurrently) (PHYS 115 [Min Grade: D] or PHYS 201 [Min Grade: D])

PHYS 312 Classical Mechanics II 4.0 Credits
Covers motion of system of particles, center of mass and conservation of linear momentum, description of collisions, Rutherford scattering, dynamics of rigid bodies, coordinate systems, the restricted three-body problem, generalized coordinates, Lagrange's equations and Hamilton's equations, and rotation of frame.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHYS 311 [Min Grade: D]

PHYS 317 Statistical Mechanics 3.0 Credits
Covers distribution molecular velocities, transport phenomena, Maxwell-Boltzmann statistics, and quantum statistics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: MATH 210 [Min Grade: D] and PHYS 217 [Min Grade: D]

PHYS 321 Electromagnetic Fields I 4.0 Credits
Covers fields due to specified charge distributions, Gauss' law, multipole expansion of the fields, Laplace's equation, method of images, dielectrics, and energy of an electrostatic field.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHYS 115 [Min Grade: D] or PHYS 102 [Min Grade: D]

PHYS 322 Electromagnetic Fields II 4.0 Credits
Covers electric current, continuity equation, electromotive forces, magnetic fields, electromagnetic induction, magnetic properties of matter, Maxwell's equations, radiation, and radiation by moving charges.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHYS 321 [Min Grade: D]

PHYS 324 Topics in Mathematical Physics 3.0 Credits
This course presents the mathematical background needed for Thermodynamics, Classical Mechanics, Electricity & Magnetism, and Quantum Mechanics using the theory of linear vector spaces and the standard tools of elementary mathematical physics. Emphasis will be placed on the use of analytic and numerical programming techniques, using Maple, FORTRAN and C.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PHYS 325 Computational Physics III 3.0 Credits
This is the third course in the Computational Physics sequence. It presents basic scientific programming techniques and problem-solving strategies, as applied to problems in electromagnetic theory and quantum mechanics. This hands-on focuses primarily on the solution of partial differential equations in physics, Monte-Carlo methods, and matrix methods, and includes solutions of Laplace's, Poisson's and Maxwell's equations, fields due to moving charges, Fast Fourier Transforms, and solutions of the time-independent and time-dependent Schroedinger equation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 105 [Min Grade: D]

PHYS 326 Quantum Mechanics I 4.0 Credits
Explores the classical foundations of quantum mechanics, the Schrodinger equation, solutions of one-dimensional problems, and the one-dimensional harmonic oscillator.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHYS 311 [Min Grade: D]

PHYS 327 Quantum Mechanics II 4.0 Credits
Covers the three-dimensional Schrodinger equation, angular momentum, matrix mechanics, the hydrogen atom, and perturbation theory.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHYS 326 [Min Grade: D]

PHYS 328 [WI] Advanced Laboratory 3.0 Credits
Requires students to perform advanced laboratory experiments in the various fields of physics. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHYS 223 [Min Grade: D]

PHYS 330 Introduction to Nuclear Physics 2.0 Credits
Provides an overview of nuclear physics; including nuclear structure; nuclear stability; radioactivity and nuclear decay; nuclear forces and interactions; fission and fusion; and the interaction of particles with matter. A small amount of quantum mechanics will be included.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: (PHYS 115 [Min Grade: D] or PHYS 201 [Min Grade: D]) and (MATH 210 [Min Grade: D] or ENGR 232 [Min Grade: D])

PHYS 405 Advanced Computational Physics 3.0 Credits
Covers the application of computational techniques to one or more research topics of current interest, including grid-based solutions of partial differential equations in one and two dimensions and particle methods in fluid mechanics. Introduces high-performance computation and massively parallel computing platforms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: PHYS 305 [Min Grade: C]

PHYS 408 Physics Seminar 1.0 Credit
Requires participation in weekly departmental colloquium.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 15 times for 16 credits
Restrictions: Can enroll if major is PHYS and classification is Junior or Senior.

PHYS 409 Astrophysics Seminar 1.0 Credit
This course focuses on topics in modern astrophysics. Each term, a series of papers in a subfield is chosen. Students present and discuss recent results in fields such as stellar structure, black holes, cosmology, and dynamics. May be repeated twice for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 2 times for 2 credits
Prerequisites: PHYS 231 [Min Grade: D] or PHYS 232 [Min Grade: D]

PHYS 428 Quantum Mechanics III 4.0 Credits
Advanced topics in quantum mechanics including spin, addition of angular momentum, scattering theory, relativistic quantum mechanics, atoms and molecules, and radiation from atoms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHYS 327 [Min Grade: D]

PHYS 431 Galactic Astrophysics 3.0 Credits
This course presents an introduction to the processes responsible for the formation, structure, evolution, and present-day appearance of the Milky Way and other galaxies. Using the Milky Way Galaxy as a guide, we will develop analytical and numerical tools to help us understand of the properties of these magnificent objects, near and far. Topics will include stars, stellar formation, and stellar evolution, galactic structure and dynamics, and galaxy formation and evolution.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHYS 311 [Min Grade: D]

PHYS 432 Cosmology 3.0 Credits
Covers cosmological models, age and distance scales in the universe, the hot big bang, primordial nucleosyntesis, inflation, baryonic and non-baryonic matter, galaxy formation and evolution, dynamics of structure formation, statistics of cosmological density fields, and cosmic background fluctuations.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHYS 311 [Min Grade: D]

PHYS 452 Solid State Physics 3.0 Credits
Atomic basis of the physical properties of materials, including crystalline and non-crystalline solids. Detailed introductory treatment of the structural, vibrational, and electronic properties of solid and their inter-relationships. Overview of other materials, properties, and scientific basis of technological applications.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 317 [Min Grade: D] and PHYS 326 [Min Grade: D]

PHYS 453 Nanoscience 3.0 Credits
Scientific basis of nanoscale materials and systems including discussions of low-dimensional structures and their physical properties, the self-assembly of nanostructures, applications in various fields of science and technology, and techniques for fabrication and characterization on the nanoscale.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 311 [Min Grade: D] and PHYS 217 [Min Grade: D]
Corequisites: PHYS 321, PHYS 326

PHYS 461 Biophysics 3.0 Credits
A one course introduction to biological physics. Topics may include: structure of biomolecules, protein stability, electron transfer, protein folding, protein substrates, allostery, and self-assembly. No biological background is presumed.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 1 times for 3 credits
Prerequisites: PHYS 317 [Min Grade: D]

PHYS 462 Computational Biophysics 3.0 Credits
This course involves mathematical applications of biological simulations. Using classical and statistical mechanics, we will cover topics including atomic scale simulations, statistical sampling and models of molecular cellular systems and living processes.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PHYS 105 [Min Grade: D] and PHYS 217 [Min Grade: D] and MATH 210 [Min Grade: D]
Corequisite: PHYS 321

PHYS 471 Nonlinear Dynamics 3.0 Credits
This course introduces the basic ideas of the new science of nonlinear dynamics and develops methods to carry out fundamental computations of fractal dimension, Lyapunov exponents, and topological invariants.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: MATH 200 [Min Grade: D]

PHYS 476 Particle Physics 3.0 Credits
This course will provide an introduction to the physics of fundamental particles. Topics including the fundamental forces, quarks and leptons, Feynman diagrams, symmetries and conservation laws, relativistic kinematics, bound states, and experimental methods.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore
Prerequisites: PHYS 327 [Min Grade: D]

PHYS 485 Research 0.0-3.0 Credits
Covers research problems in physics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PHYS 491 Senior Research I 3.0 Credits
A three-term sequence devoted to theoretical or experimental activities in a specific area of physics or atmospheric science to be chosen in consultation with a faculty adviser. Requires students to learn to identify interesting problems, develop a plan of attack, and carry the project to completion. Requires written and oral report at the end of the third term.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.

PHYS 492 Senior Research II 3.0 Credits
Continues PHYS 491.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHYS 491 [Min Grade: D]

PHYS 493 [WI] Senior Research III 3.0 Credits
Continues PHYS 492. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PHYS 492 [Min Grade: D]

PHYS I199 Independent Study in PHYS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PHYS I299 Independent Study in PHYS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PHYS I399 Independent Study in PHYS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PHYS I499 Independent Study in PHYS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PHYS T180 Special Topics in Physics 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PHYS T280 Special Topics in Physics 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PHYS T380 Special Topics in Physics 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PHYS T480 Special Topics in Physics 0.0-12.0 Credits
Covers selected topics in physics. May be repeated for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Physics - Environmental Science

Courses

PHEV 145 Weather I: Climate and Global Change 4.0 Credits
Introduction to the Earth's atmosphere and climate system including the structure and interaction of the components of this system. Students learn basic meteorological ideas and concepts. Special topics include weather satellite and Doppler radar imagery, daily weather discussions, the greenhouse effect and ozone depletion.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PHEV 146 Weather II: Analysis and Forecasting 4.0 Credits
Course covers real problems of weather analysis and forecasting. Components focus on surface and upper-air weather maps, westerlies and the jet stream, mid-latitude cyclones, thunderstorms, tornadoes and hurricanes. Special topics include weather instruments and observations, atmospheric optics and climate analyses.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

Physiology

Courses

PHGY 325 Physiology 5.0 Credits
Presentation of organ function with emphasis on the integration of neural and humoral control mechanisms.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: ANAT 101 [Min Grade: D] and ANAT 102 [Min Grade: D] and ANAT 103 [Min Grade: D] or (BIO 201 [Min Grade: D] and BIO 202 [Min Grade: D])

PHGY 382 Pathophysiology for Health Professions 5.0 Credits
Introduction to disturbances of normal function and basic mechanisms involved in diseases of major organ systems. Presentation of the general aspects of the common human pathophysiological conditions and syndromes.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is NUOL.

Political Science

Courses

PSCI 100 Introduction to Political Science 4.0 Credits
Studies the political process, which determines who gets what, when, and how in society.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 110 American Government 4.0 Credits
Introduces the elements of the American political system.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 120 History of Political Thought 4.0 Credits
Introduces the Western tradition of political thought, examining a selection of works by major political thinkers. Draws on primary sources, with a textual and conceptual emphasis.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 131 [WI] Research Design for Political Science 4.0 Credits
Introduction to basic principles of political science research design. Examines the process of formulating research questions in political science, developing theories with testable implications, and hypothesis testing. Students produce a research proposal including research question, literature review, and research design.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 140 Comparative Politics I 4.0 Credits
Examines methods used to compare state political systems with respect to world order values in varying geographic and cultural settings.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 150 International Politics 4.0 Credits
Analyzes nation-states in their external relations, including the interaction of the great powers with each other and with emerging areas.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 210 American Political Development 4.0 Credits
Focusing on long-term processes, the course examines state formation, institution-building, institutional competition, and policy-making in the American context. The course provides historical and political background that makes sense of vital present-day issues like national security, racial and ethnic politics, and health care policy.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSCI 110 [Min Grade: D]

PSCI 220 Constitutional Law I 4.0 Credits
Introduction to Constitutional law and the federal courts. Examines the emergence of judicial review, the judiciary's role in the system of check and balances, and the powers and limitations on each branch of government.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSCI 110 [Min Grade: D]

PSCI 223 Comparative Political Thought 4.0 Credits
Provides an introduction to comparative political theory by studying non-canonical texts originating both within Europe and the United States and outside those areas, generally in colonized or formerly colonized countries. Specific theories include those of DuBois, Fanon, and Mariategui.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSCI 120 [Min Grade: D]

PSCI 229 Theories of Justice 4.0 Credits
Examines the nature and realization of justice over time, with special attention to the ways that justice has been conceptualized and re-conceptualized over time.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 231 Qualitative and Mixed-Methods Research in Political Science 4.0 Credits
Considers the theoretical and methodological challenges and opportunities associated with qualitative and multi-method research designs. Includes issues of causation, explanation, and inference, as well as practical considerations of specific research designs and methods. The qualitative research designs considered include "small-n" historical case studies and process tracing. Specific techniques include focus groups, structured and semi-structured interviews, oral histories, archival research, participant observation, ethnographic investigations, action research, and the use of memoir and journalistic sources as data.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 232 Quantitative Research Methods in Political Science 4.0 Credits
This course provides students with concepts, principles and tools of quantitative research methodology for political science. Core concepts include quantitative measurement of political topics, survey research, and linear regression analysis.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 240 Comparative Politics II 4.0 Credits
Uses the tools of comparative politics to examine key political issues across democratic and non-democratic countries.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSCI 140 [Min Grade: D]

PSCI 250 American Foreign Policy 4.0 Credits
Examines current issues in American foreign policy, including the assumptions underlying policy goals, the means of achieving them, and the decision-making machinery.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSCI 150 [Min Grade: D]

PSCI 252 Global Governance 4.0 Credits
Introduces students to the theory and practice of international organizations. Focuses on three broad questions: Do international organizations matter? How do they matter? Should they matter? Course begins with an overview of major theoretical perspectives and continues with an examination of the United Nations system and its role in security, development, human rights, global health and environmental politics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSCI 150 [Min Grade: D] or PSCI 140 [Min Grade: D]

PSCI 255 International Political Economy 4.0 Credits
The overarching theme of this course is the process of globalization, the factors leading to a single world economy tied together by technology, trade, and investment, and the factors keeping up independent economic zones and nations in economic competition and sometimes in open political opposition.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 260 [WI] Power in Protest: Social Movements in Comparative Perspective 4.0 Credits
This course considers theoretical approaches to comparative social movements by closely examining evidence about specific movements. Questions include: When and why do people mobilize to make demands against their states and societies? What contextual conditions enable such mobilization, and under what conditions does mobilization decline? Finally, do movements actually matter for bringing about change? This course is designed to gain leverage on these questions by surveying an eclectic literature from international relations and comparative politics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSCI 140 [Min Grade: D] or PSCI 150 [Min Grade: D]

PSCI 284 Environmental Politics 4.0 Credits
Examines environmental politics, focusing on the United States. Solving environmental problems is not simply a question of using available science and technology; rather, proposals to combat environmental degradation confront political context that may or may not favor the aims of environmental policy. Understanding politics is therefore indispensable for effective environmental problem-solving.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 289 Technology and Politics 4.0 Credits
How do technologies shape politics, and how do human interests produce particular kinds of technologies? This course will examine the life of many different kinds of technologies through the lens of human use, institutional practice, economic interests, policy, and social movements. Case studies will include the data rescue movement, smartphones and surveillance culture, Hurricane Harvey and infrastructure, inclusive/barrier-free design, and the ethics of human enhancement, among other topics. A core part of the course will be learning and developing skill in social science research through fun micro-assignments.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 305 Social Development: A Global Approach 4.0 Credits
This course is a general introduction to issues posed by the notions of development and progress of societies. Issues to be discussed include indices of social development, economic growth, and health progress, and their significance in relation to general views on social development and human progress. The concept of standard of living, the human development index, the demographic transition and the gender and political aspects of development will be also discussed. As a general introduction to the issues implied by the relationships between economic progress, population growth, health, and politics, as major concepts involved in the notion of social development, the course has links with demography, sociology, history of political thought, economics, anthropology, and the health sciences.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 310 Civilians in Armed Conflict 4.0 Credits
What happens to civilians in times of war? What are the responsibilities of militaries and rebel groups to people under their control -- and do they meet them? Who counts as a "civilian," anyway? This course considers these questions and more. We examine the definition and causes of armed conflict, before turning to key issues such as civilian coping strategies during armed conflict, common patterns of violence against civilians, legal and policy remedies for human rights violations, and the politics of human rights advocacy.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 313 State & Local Government 4.0 Credits
Examines major political, social, and economic problems of state, local, and metropolitan governments.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSCI 320 The United States Congress 4.0 Credits
An overview of politics and policy-making in the US Congress. Topics include: How are laws really made? What determines who is elected to Congress, and who leads once members are in place? How much does money matter in Congressional politics? How effective is Congress at passing legislation, and how effective is the legislation that eventually passes?.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSCI 110 [Min Grade: D]

PSCI 325 Political Theory from Below 4.0 Credits
Rethinks traditional approaches to political theory by emphasizing study of texts and movements "from below," drawn from both African American and Latin American thinkers.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 330 Public Opinion & Propaganda 4.0 Credits
Examines public opinion and propaganda from a variety of perspectives, including the process of opinion formation and change and its role in the development of public policy and methods of measurement and analysis of public opinion.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSCI 334 Politics of Environment and Health 4.0 Credits
Examines political aspects of environmental health issues. Students will examine how "environment" and "health" are defined by different stakeholders. How, according to these political actors, is health impacted by environment, and how are environmental factors addressed in healthcare? How do scientists study human exposure in everyday environments? What institutions are responsible for regulating hazardous materials? How is community health impacted by pollution and what actions do communities take to protect health? Using historical and contemporary case studies, students will engage with these questions at different scales of analysis, learning about the politics of knowledge, social movements, the medical establishment, and the ethics of health in late industrialism.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 335 Political Communication 4.0 Credits
Introduces an investigation of the relationship between politics and communication, with the goal of developing an understanding of political communication's role in election campaigns, news coverage, political debates, political advertising, and "normal" portrayals of the political system through media and interpersonal communication.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSCI 345 Comparative Politics of the Middle East 4.0 Credits
Introduces students to political issues and challenges that face Middle Eastern men and women and deepens their understanding of comparative politics in non-Western cultures and nations. Analyzes such common problems as nationalism, religion, and state/society relations, then examines in depth four countries representing various regimes. Assumes some familiarity with Middle Eastern history and concentrates primarily on contemporary politics and political economy.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSCI 150 [Min Grade: D] or PSCI 140 [Min Grade: D]

PSCI 351 International Organizations: The United Nations 4.0 Credits
The goal of this course is to present an overview of the nature and function of international organization in world politics. The role of the United Nations and its agencies are highlighted. Students gain an understanding of how international life is structured through these institutions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 352 Ethics and International Relations 4.0 Credits
Are ethics relevant in world politics, or are power and survival the only concerns? This course considers the main moral issues facing the international community. Topics include the "just war" tradition, human rights, humanitarian intervention, and what rich countries owe the poor.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 353 International Human Rights 4.0 Credits
This course examines the origin of the international human rights movement after World War II, and discusses key issues confronting the international community today. These include genocide, political repression, the rights of women, and religious and cultural minorities. It also considers the moral basis of the rights ideal.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 357 The European Union in World Politics 4.0 Credits
This course combines an introduction to the history and institutions of the European Union with a special analysis of EU enlargement and institutional reform.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 360 International Law 4.0 Credits
The legalization of world politics is one of the most interesting and potentially transformational trends in international relations. Across substantive areas, including matters of security, trade, environmental affairs, and human rights, international law is playing an increasing role in international politics. The course considers theoretical approaches and contemporary events to better understand where international law comes from, how it is designed, and why states comply (or not). In addition, we consider contemporary debates and challenges, including the contested jurisdiction of international courts, the immunity of the United Nations, evolving law on humanitarian military intervention, and the fragmentation of international law in environmental affairs, among other topics.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 361 The Politics of LGBT Movements and Rights 4.0 Credits
In many countries, the subject of LGBT (lesbian, gay, bisexual, and trans) rights has entered the political discourse with unprecedented speed and suddenness. This course is designed to gain leverage on the processes that explain this rapid global expansion of LGBT rights by surveying an eclectic literature on comparative and transnational LGBT politics. Specially, we will ask: What factors have facilitated the mobilization of LGBT people? How and why have public opinion and laws towards LGBT people changed differently across various countries? To answer these questions, we will take an in-depth empirical look at movements representing LGBT people and their successes/losses—as well as those of their opposition—across time and place, from the late 1800s to present day and across the globe.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 363 Constitutional Law II 4.0 Credits
Examines protections for civil liberties afforded by the First Amendment of the Constitution, specifically those related to speech, the press, religion, and assembly.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSCI 364 Constitutional Law III 4.0 Credits
Examines Constitutional civil rights claims arising under the Fourteenth Amendment equal protection and due process guarantees. Focuses on claims concerning discrimination on the basis of race, gender, and sexual orientation, as well as those asserted under an individual right to privacy in matters of reproductive rights, sexual conduct, and end of life decisions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSCI 366 Supreme Court and American Politics 4.0 Credits
This course focuses on the workings of the modern Supreme Court: theories of judicial interpretation; internal decision-making processes; the interplay of law and politics on the Court's personnel, agenda, and rulings; and the role of interest groups in shaping the Court's jurisprudence.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSCI 369 The Politics of Food 4.0 Credits
This course examines how politics shapes our diet. Though cultural and personal preferences influence what we eat, our food choices unfold in the context of public policies such as agricultural subsidies, trade agreements, and food safety regulations, etc. The first part of the course describes and analyzes the US food system, with a focus on regulatory policies and interest group politics. The second part of the course examines the ideas and practices of food-based social movements that seek to create a food system that is less harmful to human and international health and more socially just than the existing system.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 371 Science, Technology, & Public Policy 4.0 Credits
Examines the political effects of technological change, including public policy efforts to affect the impact of scientific development. Covers topics including atomic energy, electronic communications, and weapons development.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSCI 372 City in United States Political Development 4.0 Credits
Course examines the role of the American city in the larger project of state-building. Topics covered include the changing functions of cities over American history; the role of cities in national political coalitions; and the construction of ethnic, racial, and class identities as a process or urbanization.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 373 Animal Politics 4.0 Credits
This course examines the politics of human-animal interactions. Human relationships with animals vary by time and place: the same species might be a pet at one time, a food at another, and somewhere else, a model organism for experimental research. Understanding those relationships, and why they change, can help elucidate what it means, ethically, politically, and biologically, to be human. Topics in this course include animal rights and experimentation, the livestock industry, animal intelligence, and environmental legislation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSCI 374 Politics of Sport 4.0 Credits
The material in this course comes from a variety of disciplines and schools of thought with political science serving as an overarching framework. Issues covered include ethnicity, gender, race, nationalism, globalism, economics, and class.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 375 Politics of Immigration 4.0 Credits
This course is designed to introduce the student to the issues associated with immigration from both a US and international as well as a historical and contemporary perspective. Emphasis will be focused on the theory, public policy and philosophical issues that are associated with this area of inquiry.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 376 Running for Political Office 4.0 Credits
This course is designed to introduce the students to both the theory and practice of running for political office. Emphasis will be placed upon both the theoretical and applied aspects of political campaigns. The course will use a combination of readings, a text, films, lectures, and guest speakers.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 377 Politics of Latin America 4.0 Credits
Analysis of contemporary politics in South and Central American, as well as Cuba, with several in-depth country cases. Comparative themes include: legacies of military rules, economic dependency and revolution; dynamics of democratic transition, economic reform and U.S. hegemony; and, problems of domineering presidents weak parties and marginalized social groups.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSCI 492 Political Science Thesis I 4.0 Credits
Students develop and begin an in-depth research project under the supervision of a political scientist. Course is restricted to seniors with a minimum 3.30 GPA. Can be continued as PSCI 493.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PSCI and classification is Senior.

PSCI 493 Political Science Thesis II 4.0 Credits
Students complete an in-depth research project under the supervision of a political scientist.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PSCI and classification is Senior.
Prerequisites: PSCI 492 [Min Grade: D]

PSCI I199 Independent Study in PSCI 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PSCI I299 Independent Study in PSCI 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PSCI I399 Independent Study in PSCI 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PSCI I499 Independent Study in PSCI 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PSCI T180 Special Topics in Political Science 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PSCI T280 Special Topics II 0.5-12.0 Credits
Special topics in political science at the intermediate level. See department for details of current offerings.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PSCI T380 Special Topics III 0.5-12.0 Credits
Special topics in political science at the intermediate/advanced level. See department for details of current offerings.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PSCI T480 Special Topics IV 0.5-12.0 Credits
Special topics in political science at the advanced level. See department for details of current offerings.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Product Design

Courses

PROD 101 History and Analysis of Product Design 3.0 Credits
This class studies the chronological context of the development of the product design profession, relating it to the social, cultural and economic events that helped shape our modern day society. Studies are focuses on major industrial designers and innovations. This course has both a project and written analysis paper component.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

PROD 205 Applied Making I 3.0 Credits
This course introduces the development of rapid study models and mid-fidelity prototypes related to product design. Students, through a series of exercises, build study models of products to professional standards of accuracy and finish, with an emphasis on rapid development. Aspects of workshop practice and safety are emphasized.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PROD 101 [Min Grade: D]

PROD 210 Introduction to Product Design 3.0 Credits
This course introduces students to basic product design techniques. It combines lectures, demonstrations, discussions and problem solving exercises exploring product design as a creative process in the production of simple objects. Students develop a command of product development, skills in modeling and communication of their novel solutions.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PROD 101 [Min Grade: C]

PROD 215 Design Thinking in Product Design 4.0 Credits
This course is a studio-seminar introducing principles and theories of product design, systematic design process, problem-solving, decision making and design as authorship. The course uses design research methods, and topical design issues to explore and expierience design thinking.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

PROD 220 Product Design Form Studio 4.0 Credits
This course uses principles of design in the visual organization of physical elements and analysis of form. Building on abstract relationships including additive and subtractive forms as well as gestalt. Students develop a sensitivity to form language, semantics and aesthetics of volumes and synthesize this abstract language into functional objects.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PROD 210 [Min Grade: C] and PROD 205 [Min Grade: D] and PROD 235 [Min Grade: C]

PROD 225 Computer Aided Imagining in Product Design 3.0 Credits
This is an applied computer class in which students pursue the development of design projects using current product design photo-realistic rendering softward for object design and three-dimensional modeling of products applicable to rapid prototyping.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PROD.
Prerequisites: MEM 201 [Min Grade: D]

PROD 230 Product Design Process Studio 4.0 Credits
In this course students are presented complex design issues in mass-produced objects. Students develop an understanding of the product development process focusing on the designers skills and technical knowledge to formulate appropriate design solutions. Students practice collaboration of ideas with engineers, marketing, users and shareholders.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PROD 210 [Min Grade: C] and PROD 220 [Min Grade: C]

PROD 235 Applied Design Visualization 3.0 Credits
This course will provide students with schemas and strategies for using visualization as a thinking tool, as well as persuasive techniques for communicating design intent. It will put into practice the essential techniques that product designers use to think and communicate visually.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

PROD 245 Seminar Professional Landscape 3.0 Credits
In this course students explore current trends in the product design profession today. Students will research and present insights into important design issues, trends, and criticism in contemporary product design. Through extensive readings and discussions, students develop an understanding of the relationship of product design to society and culture.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PROD.
Prerequisites: PROD 220 [Min Grade: D]

PROD 255 Applied Materials in Product Design 3.0 Credits
The course emphasizes the practical relationship between product design and the manufacturing industry and the technical considerations that influence the choice of material and process for small batch and mass production.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PROD.
Prerequisites: PROD 235 [Min Grade: C] and MATE 120 [Min Grade: D] and MATE 121 [Min Grade: D]

PROD 340 Interdisciplinary Product Design Studio 4.0 Credits
Through a focused design project, students of various backgrounds
and departments collaborate on complex design issues as they seek to
create an appropriate and novel solution to the assigned design problem.
Bringing both the PROD majors and PROD minors together, students
work as teams through the product development cycle.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PROD 230 [Min Grade: C] and PROD 235 [Min Grade: C]
and PROD 255 [Min Grade: C]

PROD 345 Applied Human Centered Design 3.0 Credits
This course explores the physical, psychological, perceptual, and
behavioral characteristics of humans. Through a series of lectures and
projects, this information is applied to the field of product design to
develop safe and effective products.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: PSY 101 [Min Grade: D] and PROD 340 [Min Grade: C]

PROD 350 Sponsored Product Design Studio 4.0 Credits
Students undertake projects that are sponsored by industry partners to
investigate a broad range of design, marketing and production issues.
In this course, students, working in a team environment, research user
needs, human factors, aesthetic issues, manufacturing requirements, and
market demands to indentify user needs and product opportunities.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PROD.
Prerequisites: PROD 340 [Min Grade: C] and PROD 255 [Min Grade: C]

PROD 399 Independent Study in Product Design 3.0 Credits
Provides individualized study in product design in a specialized area of
study. May be repeated for credit.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 2 times for 6 credits
Restrictions: Can enroll if major is PROD and classification is Junior or
Senior.
Prerequisites: PROD 340 [Min Grade: D]

PROD 425 Applied Design Research 3.0 Credits
This course covers diverse theories and methods for conducting product
design research. Emphasis is given to understanding quantitative and
qualitative research methods and the role the designer in synthesizing
and applying research as a critical part of the design process. This course
combines writing and short projects.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PROD.
Prerequisites: COM 220 [Min Grade: D] and PROD 345 [Min Grade: C]

PROD 460 Research Synthesis Studio 4.0 Credits
In this first of two senior studios, students apply their skills to initiate
research on an opportunity of their selection. Under supervision, students
demonstrate control of applied design research and synthesis. This
course focuses on the information gathering, study, and analysis that
product designers do to inspire and inform themselves.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PROD.
Prerequisites: PROD 340 [Min Grade: C] and PROD 345 [Min Grade: C]

PROD 470 Create Build Studio 4.0 Credits
In this second of two studios, students apply their skills to develop a
solution based on the research conducted in the previous studio. Under
supervision, students will demonstrate control of the product design
process in the producation of a novel and appropriate user-focused
solution.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PROD.
Prerequisites: PROD 460 [Min Grade: C] and PROD 425 [Min Grade: C]

PROD 475 Professional Practice in Product Design 3.0 Credits
This course provides information about career planning and job seeking,
including the development of cover letters, resumes, online and physical
portfolios and the interview process. Practicing design professionals
serve as guest speakers and conduct mock interviews to address topics
relevant to the practice of product design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PROD.
Prerequisites: PROD 460 [Min Grade: D]

PROD 480 Exhibition Studio 4.0 Credits
This final studio is a culmination of the educational experience
in the production of a senior exhibition highlighting the students'
accomplishments. Under supervision, students work together to
demonstrate control of all aspects of the design process and visual
communication in the production of a graduation exhibition.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PROD.
Prerequisites: PROD 470 [Min Grade: C]

PROD I199 Independent Study in Product Design 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PROD I299 Independent Study in Product Design 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PROD I399 Independent Study in Product Design 3.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 2 times for 6 credits

PROD I499 Independent Study in Product Design 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PROD T180 Special Topics in Product Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PROD T280 Special Topics in Product Design 0.0-4.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PROD T380 Special Topics in Product Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

PROD T480 Special Topics in Product Design 0.5-4.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 6 times for 24 credits
Restrictions: Can enroll if major is PROD.

Professional Studies

Courses

PRST 211 Computer Applications for Professionals 3.0 Credits
Through lecture-demonstrations, hands-on labs, independent study assignments, and case study analysis, students are challenged to use critical-thinking, data analysis and problem-solving techniques to develop cost-efficient and effective solutions to realistic professional problems using computer-based business application software. Students should possess a basic level of computer proficiency before taking this course.
College/Department: GC-3690
Repeat Status: Not repeatable for credit

PRST 212 Creative Studies in the World Wide Web 3.0 Credits
This course prepares professionals with an understanding of the process of developing creative, functional Web sites. Concentrating on the creative flow of the design process, the course uses Adobe Dreamweaver as the medium for development. Students should possess a basic level of computer proficiency before taking this course.
College/Department: GC-3690
Repeat Status: Not repeatable for credit

PRST 303 Interpersonal Skills for Virtual Teams 3.0 Credits
This course will introduce students to the dynamics of virtual teamwork and will allow students to experience first-hand the opportunities and challenges associated with operating in a virtual environment.
College/Department: GC-3690
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PRST 330 Career & Professional Development 3.0 Credits
This course explores the literature of careers including preparation, organizational entry, orientation, nontraditional careers, and early, mid, and later career issues. The course provides students with opportunities for assessment of interests and capabilities, initiation and implementation of a personal development plan (PDP), and feedback on personal and career development.
College/Department: GC-3690
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PRST 380 Advanced Special Topics in PRST 1.0-4.0 Credit
Covers special topics of interest in Professional Studies. This course may be repeated for credit.
College/Department: GC-3690
Repeat Status: Can be repeated 11 times for 12 credits

PRST 440 Policy Analysis 3.0 Credits
The course analyzes the entire process of policy agenda-setting, initiation, decision-making, implementation, evaluation and assessment. Students will be equipped with tools to analyze and understand the entire process of policy formation in any public or private enterprise. The skills developed in this course can be used in many professional fields.
College/Department: GC-3690
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

PRST 450 Creative Leadership for Professionals 3.0 Credits
This course presents leadership as a collaborative focus for transforming change. Topics include the leadership crisis, differences between leadership and management, how leaders create and change culture, and ways in which leaders build creative, enduring organizations. In addition, the course is designed to help students develop their own leadership potential.
College/Department: GC-3690
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

PRST I199 Independent Study in PRST 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: GC-3690
Repeat Status: Can be repeated multiple times for credit

PRST I299 Independent Study in PRST 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: GC-3690
Repeat Status: Can be repeated multiple times for credit

PRST I399 Independent Study in PRST 0.5-6.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: GC-3690
Repeat Status: Can be repeated 11 times for 6 credits

PRST I499 Independent Study in PRST 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: GC-3690
Repeat Status: Can be repeated multiple times for credit

PRST T180 Special Topics in PRST 1.0-4.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: GC-3690
Repeat Status: Can be repeated 11 times for 12 credits

PRST T280 Special Topics in PRST 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: GC-3690
Repeat Status: Can be repeated multiple times for credit

PRST T380 Special Topics in PRST 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: GC-3690
Repeat Status: Can be repeated multiple times for credit

PRST T480 Special Topics in PRST 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: GC-3690
Repeat Status: Can be repeated multiple times for credit

Project Management

Courses

PROJ 101 Project Management for All 3.0 Credits
Essentials of managing projects and application of planning, monitoring and controlling techniques throughout the project life-cycle. Students learn the hands-on fundamentals of project management that enhance their ability to support projects in their current or future organizations in any field. Open to students in all disciplines.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

PROJ 401 Introduction to Project Management 3.0 Credits
This course examines design, appraisal, planning, and implementation of a project. It provides in-depth analysis of approaches to managing projects in both public and private sectors.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D]

PROJ 402 Essentials of Project Planning & Scheduling 3.0 Credits
This course will prepare students to apply relevant concepts in project planning, scheduling and control. Project scheduling methods are covered including: bar (Gantt) charts, network diagrams, critical path method, three-point estimates, critical chain concepts, resource allocation, resource leveling, and earned value management.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PROJ 301 [Min Grade: C] or PROJ 401 [Min Grade: C]

PROJ 403 Essentials of Project Leadership and Teamwork 3.0 Credits
This course will examine the organizational environment required for building and maintaining successful project teams. It prepares and provides guidance to project team members and managers to use human resources effectively through good management, wise leadership, and meaningful communications.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PROJ 301 [Min Grade: C] or PROJ 401 [Min Grade: C]

PROJ 410 Essentials of Project Quality Management 3.0 Credits
This course will examine basic quality concepts, tools, and techniques, and explore the sub-processes of quality management: quality planning, quality assurance, and quality control as they relate to project management.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PROJ 301 [Min Grade: C] or PROJ 401 [Min Grade: C]

PROJ 415 Essentials of Project Estimation & Cost Management 3.0 Credits
This course will provide an overview of basic project financial and economic principles involved in managing projects. It is intended to familiarize project team members and managers with relevant methods, tools, and techniques in project cost estimation, budgeting, cost forecasting, and cost control.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PROJ 301 [Min Grade: C] or PROJ 401 [Min Grade: C]

PROJ 420 Essentials of Project Risk Assessment & Management 3.0 Credits
This course will examine the major risk factors throughout various phases of the project life cycle. It considers the overall project planning process, describes key concepts of project risk planning, highlights relevant tools and techniques for risk identification, explores the use of risk assessment methods, and emphasizes risk and opportunity response strategies.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PROJ 301 [Min Grade: C] or PROJ 401 [Min Grade: C]

PROJ 430 Essentials of Managing Multiple Projects 3.0 Credits
This course will examine the management principles, tools, and techniques required to manage multiple projects. Emphasis is placed on functions of the project management office (PMO) and practices of project and program portfolio management.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PROJ 301 [Min Grade: C] or PROJ 401 [Min Grade: C]

PROJ 435 Essentials of International Project Management 3.0 Credits
This course will examine the adaptation of project management principles and methods when operating in an international environment. It investigates cultural, legal, ethical, and financial factors in the context of managing international projects.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Prerequisites: PROJ 301 [Min Grade: C] or PROJ 401 [Min Grade: C]

PROJ I199 Independent Study in PROJ 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

PROJ I299 Independent Study in PROJ 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

PROJ I399 Independent Study in PROJ 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

PROJ I499 Independent Study in PROJ 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

PROJ T180 Special Topics in PROJ 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

PROJ T280 Special Topics in PROJ 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

PROJ T380 Special Topics in PROJ 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

PROJ T480 Special Topics in PROJ 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

Psychology

Courses

PSY 101 General Psychology I 3.0 Credits
Reviews the fundamental principles, concepts, and methods of psychology, with emphasis on the concepts of motivation, learning, and perception, and their psychological foundations.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSY 111 Pre-Professional General Psychology I 3.0 Credits
Preprofessional General Psychology is designed for majors and for other preprofessionals who are interested in Psychology as a minor. A scientific approach to the study of psychology is taken. An overview of the fundamental principles of psychology across a variety of sub-disciplines is offered. Part one is part of a two-part sequence and focuses on the experimental bases of psychology.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSY 112 Pre-Professional General Psychology II 3.0 Credits
Preprofessional General Psychology is designed for preprofessionals who are interested in psychology or related fields, especially designed for majors, and may be taken by minors of psychology. It follows Preprofessional General Psychology I and includes a laboratory component to enhance the scientific approach to psychology. Part two focuses on the application of scientific principles of psychology to human behavior.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSY 111 [Min Grade: D]

PSY 120 Developmental Psychology 3.0 Credits
Examines the nature of developmental processes-perceptual, intellectual, emotional, and social-and the factors influencing and limiting them.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSY 140 Approaches to Personality 3.0 Credits
Discusses the major concepts of Freud, neo-Freudians, behaviorists, humanists, trait theorists, and others. Emphasizes understanding of self and others for psychotherapy and research. Fall.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSY 150 Introduction to Social Psychology 3.0 Credits
Examines theoretical and research findings in personal experiences of interacting with others in family and group settings, and with society in general.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSY 210 Evolutionary Psychology 3.0 Credits
Covers principles of genetics and evolution as applied to the behavior of the important types of living beings, from plants and unicellular organisms to the primates (including humans).
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSY 212 Physiological Psychology 3.0 Credits
Reviews neural foundations of behavior, including the study of nerve activity and brain function.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSY 213 Sensation and Perception 3.0 Credits
Examines the structure and function of the senses, including vision, hearing, touch, temperature, pain, olfaction, gustation, time, and kinesthesia. Considers interaction of the senses and their role in determining behavior.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSY 222 Psychological Problems of Modern Youth 3.0 Credits
Examines psychological problem areas frequently encountered by young adults in today's society, including identity crisis, family conflict, the new sexuality, drugs, and the search for intimacy.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSY 225 Child Psychopathology 3.0 Credits
This class will focus on the symptoms, etiology, and primary methods of treating common psychological disorders and problems of children and adolescence. The course will focus on diagnosis; assessment; specific therapeutic treatments; ethical issues; and gender, cultural, and developmental differences in symptoms, diagnosis, and response to treatment.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 240 [WI] Abnormal Psychology 3.0 Credits
Offers advanced course in the general study of personality. Focuses on the way our society defines, explains, and handles behavior perceived as deviant and "normal." This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSY 242 Psychology of Disability 3.0 Credits
Psychological and social consequences of physical disability for the disabled person and his or her family and social network. Emphasis on disabilities of the sensory and nervous systems. Practicum component.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSY 244 Culture and Personality 3.0 Credits
This course focuses on comparing specific human behaviors (e.g. aggression, health), roles (e.g. gender), and psychological processes (e.g. cognition, emotion, perception) across cultures in order to ascertain similarities and differences among cultures around the globe. This course has an interdisciplinary focus.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 245 [WI] Sports Psychology 0.0-3.0 Credits
Covers sports psychology, which is the science of understanding, modifying, and predicting athletic performance or sports participation. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSY 250 [WI] Industrial Psychology 3.0 Credits
Covers theories, experiments, and problem-solving efforts of behavioral scientists in industrial settings for students interested in interpersonal relations, management, leadership, personnel, and applied psychology. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSY 252 Death and Dying 3.0 Credits
Explores death and dying from various perspectives, including the philosophical, psychological, sociocultural, and personal.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSY 254 Psychology of Sexual Behavior 3.0 Credits
Examines psychology of the individual coping with the sexual aspects of life.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSY 264 Computer-Assisted Data Analysis I 3.0 Credits
Covers data analysis using a mainframe statistical package covering basic elementary techniques of data reduction, manipulation, and statistical analysis.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 265 Computer-Assisted Data Analysis II 3.0 Credits
Covers more advanced statistical techniques, such as regression, correlation, analysis of variance, and multiple regression.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]) and PSY 264 [Min Grade: D]

PSY 270 Psychology of Hate 3.0 Credits
Hate is a multi-faceted concept, used in many contexts. Thus, as such trying to create a definition for the concept of hate is not without difficulty. In this course we will focus on hate between/among individuals, groups, and populations. We will try to understand how hate develops, what developmental, social, and clinical factors give rise to hate. We will examine prevalent hate groups and how they recruit. And, we will examine ways that we might be able to combat hate, both in broad terms, but even more so at the micro levels.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

PSY 280 Psychological Research I 3.0 Credits
This course provides an introduction to the issues, techniques and
methodologies associated with conducting psychological research. Topics
to be covered include the logic of research in psychology, important
issues in deciding how to study various psychological phenomena, ethical
issues and guidelines in conducting psychological research, design and
analysis of psychological research, assessing threats to internal and
external validity, methods used in the interpretation of psychological data,
and writing research reports in the style used by research psychologists.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSY 264 [Min Grade: D] and PSY 265 [Min Grade: D]

PSY 285 Writing in Psychology 3.0 Credits
This course will build on students existing knowledge of psychology
while helping them better evaluate and create various types of written
documents commonly used to communicate information in the field of
psychology (e.g., research articles, literature reviews, position papers).
Emphasis is placed on a skills-based approach to acquiring knowledge of
how to communicate information and applying that knowledge in various
contexts.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSY 101 [Min Grade: C] or PSY 112 [Min Grade: C]

PSY 290 History and Systems of Psychology 3.0 Credits
Examines the historical foundations of modern psychology, with emphasis
on the growth, contributions, and decline of major systems and theories.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 305 Science and Pseudoscience in Psychology 3.0 Credits
Science and Pseudoscience in Psychology. Fosters critical thinking
skills regarding the evaluation of paranormal, unusual, or extraordinary
phenomena (e.g. ESP, recovered memories of abuse). Examines ways
that a human cognition leads to strange beliefs despite contradictory data.
The distinctions between science and pseudoscience are highlighted.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 310 Drugs & Human Behavior 3.0 Credits
Covers the fundamentals of drug effects on the nervous system and
behavior, with emphasis on abused substances and drugs used in the
treatment of behavioral disorders.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D])

PSY 312 Cognitive Neuroscience 3.0 Credits
Cognitive neuroscience is the bridge between cognitive psychology
and neuroscience: how the "hardware" of our brains produces the
"software" of thought. This course will introduce the neural basis of core
cognitive processes such as perception, attention, memory, language,
and executive functions. From movies to eye-catching headlines,
cognitive neuroscience is all around us. The goal of this course is to
immerse students in the research behind the splashy stories, so that they
can become a better consumer (and perhaps creator) of the growing
knowledge of the human brain.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 320 [WI] Educational Psychology 3.0 Credits
Covers role and relevance of psychology in the teacher-learner
relationship, with independent application of research techniques in an
individual field study. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 325 Psychology of Learning 3.0 Credits
Introduces basic principles of the science of learning. Emphasizes I. P.
Pavlov's classical conditioning, B. F. Skinner's operant conditioning, and
applications to counseling and therapy.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 330 Cognitive Psychology 3.0 Credits
Covers human thought processes, including perception and pattern
recognition, learning and memory, language, problem-solving, and
decision-making.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D] or
IDM 211 [Min Grade: D]

PSY 332 Human Factors and Cognitive Engineering 3.0 Credits
Discusses ways of designing machines, operations, and work
environments so that they match human capacities and limitations.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 335 Pediatric Psychology 3.0 Credits
The focus of this seminar is the examination of psychosocial and medical
issues during the period of infancy, childhood, and adolescense including
relevant biological, cognitive, social, emotional, and cultural aspects.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 336 Psychology of Language 3.0 Credits
This course is a survey of the theories and methodologies in the
psychology of language. It covers topics such as language acquisition,
comprehension, and production, as well as the relation between language
and thought and the question of the uniqueness of language in the animal
kingdom.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSY 337 Human-Computer Interaction 3.0 Credits
Applies cognitive and experimental psychology to understanding how to
improve the design and usability of interactive computing systems.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 342 Counseling Psychology 3.0 Credits
Covers theory and practice of establishing helping relationships. Includes
role-playing, analyzing, and observations.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 345 Narrative Psychology 3.0 Credits
This course explores the historic contributions to the narrative tradition
in psychology and its current research and theoretical concerns. We will
discuss contributions to the construction of meaning from bioethics and
medical humanities, qualitative research, the neuroscience of memory,
literary theory, and social, cognitive, and developmental psychology.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 352 Psychology of Sustainability 3.0 Credits
Multidisciplinary study of the interrelationship between human behavior
and the natural, built, and social environments.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSY 355 Health Psychology 3.0 Credits
Health Psychology is designed to: concentrate on the application
of psychological theories and variables to compromising and health
enhancing behaviors; demonstrate the psychological management of
chronic illness; and the role of psychologists written medical and health
settings. For example, it focuses on the effects of stress on the body,
the mind-body connection, and how psychology can affect physical well-
being.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 356 Women's Health Psychology 3.0 Credits
Explores the major psychological and behavioral factors influencing health
and illness among women. Topics, such as lifecycle challenges (PMS
and reproductive health), chronic diseases, and new directions in health
promotion are addressed.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 357 The Psychology of Eating Disorders and Obesity 3.0 Credits
Covers determinants of eating behavior and body weight as well as
psychological treatments for them. Factors influencing eight regulation will
be reviewed. The causes, consequences, and treatments for anorexia and
bulimia nervosa and binge eating disorder will be reviewed. Finally, the
courses will review the causes, consequences and treatments for obesity.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 360 [WI] Experimental Psychology 3.0 Credits
Provides a study of the basic scientific fundamentals of the experiment
with emphasis upon the critical thinking this method represents in
establishing psychological principles. Contrasts are made to such modern
pseudosciences as parapsychology. A final experiment is required of all
students in this course. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSY 265 [Min Grade: D]

PSY 368 Psychology - Inequity & Injustice 3.0 Credits
In this course we examine underlying values and beliefs of the field
and place them in the context such as inequity, social justice, power
relations, and what type of knowledge counts, to arrive at a more critical
understanding of the practices and theories in psychology.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 370 Forensic Psychology 3.0 Credits
This course describes the psychological processes involved in the legal
system. The material delves into the growing field of psychological study
and application in the legal field.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 371 Law and Psychology 3.0 Credits
Law and Psychology will provide basic and more specific information regarding this area of specialization in psychology. It will include a definition, description of the scope of the field, overview of important questions, relevant research approaches, and applications. Important question/topics will include criminal and juvenile offending; the psychology of police; the process between arrest, trial, and incarceration; eyewitness identification; confessions; psychological evaluations in criminal and civil law; jury selection and decision-making; the psychology of victims of crime and violence; punishment and sentencing; and juvenile and adult corrections.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSY 101 [Min Grade: D] or PSY 111 [Min Grade: D]

PSY 380 Psychological Testing and Assessment 3.0 Credits
Enables the student to gain an understanding of the proper uses and applications of psychological evaluation by focusing on psychometric properties and reviewing selected tests and evaluation procedures commonly employed by psychologists in research and clinical practice.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSY 280 [Min Grade: D] and PSY 360 [Min Grade: D]

PSY 410 Neuropsychology 3.0 Credits
Provides a study of the relationship between human brain function and behavior. Examines basic anatomy of the brain and focuses on principles of human neuropsychological functioning. Studies cortical and "higher cognitive functioning" in depth through a focus on both normal and brain-injured individuals.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 440 Advanced Personality Seminar 3.0 Credits
Examines historical and contemporary trends and methods in personality research and assessment. Students have an opportunity to evaluate strengths and limitations of these trends and methods, as well as develop their own ideas.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSY 140 [Min Grade: D] and (PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D])

PSY 442 Theories & Practices in Clinical Psychology 3.0 Credits
Provides an overview of clinical psychology theory and practice including professional issues, assessment strategies, and psychotherapy theories. Students have the opportunity to develop their own philosophy of clinical psychology and to apply theories to case examples.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 445 Positive Psychology 3.0 Credits
The course provides an overview of the emerging subfield of psychology known as "positive psychology". This area focuses on investigating and understanding positive aspects of well-being and health, including various human strengths, such as resilience, optimism, spirituality, hope, and problem-solving.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 450 Autism Spectrum Disorders 3.0 Credits
This course introduces students to research and issues involving individuals with autism spectrum disorders. Topics include societal perceptions of the disorder, epidemiology, advocacy, assessment and evaluation, adult issues, and legal issues. Course includes an overview of common interventions. Students plan and carry out interviews with individuals with autism as part of the final project.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: PSY 120 [Min Grade: C]

PSY 455 Psychology of Suicide and Non-Suicidal Self-Injury 3.0 Credits
This course focuses on the psychology of suicide and non-suicidal self-injury (NSSI). Topics will include assessment issues, risk and vulnerability factors, differences between suicide and NSSI, suicide across the life span, theories of suicide, prevention and treatment strategies, and special topics (e.g., suicide "by cop," euthanasia).
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSY 101 [Min Grade: D] or PSY 111 [Min Grade: D]

PSY 460 Advanced Experimental Psychology: Laboratory Applications and Techniques 0.0-3.0 Credits
Introduction to variety of laboratory techniques; survey of how basic psychological theories and knowledge influence actual practice in the psychological laboratory. Laboratory exercises will focus on development of the research skills necessary for independent research.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSY 463 Memory 3.0 Credits
What we call memory is a set of complex cognitive process that involves most of the brain. Memory is a challenging process to study, one that is still poorly understood. In this course we will review what we know about how memory and forgetting work. We will also study the ways in which memory is fallible and modifiable. We will review findings from behavior and cognitive psychology, cognitive neuroscience, and neuropsychology in order to try to understand how we remember and how we forget.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: PSY 101 [Min Grade: D] or PSY 112 [Min Grade: D]

PSY 477 Senior Seminar I 3.0 Credits
In-depth exploration of selected topics. Projects selected by students in consultation with professor.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSY 478 Senior Seminar II 3.0 Credits
Continuation of PSYCH 477.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

PSY 490 [WI] Psychology Senior Thesis I 4.0 Credits
An in-depth exploration of selected topics. Projects are selected by students in consultation with a faculty member. The students conduct these projects over the course of three terms in which they take PSY 490, 491, and 492. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PSY and classification is Senior.

PSY 491 [WI] Psychology Senior Thesis II 4.0 Credits
An in-depth exploration of selected topics. Projects are selected by students in consultation with a faculty member. The students conduct these projects over the course of three terms in which they take PSY 490, 491, and 492. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PSY and classification is Senior.
Prerequisites: PSY 490 [Min Grade: D]

PSY 492 [WI] Psychology Senior Thesis III 4.0 Credits
An in-depth exploration of selected topics. Projects are selected by students in consultation with a faculty member. The students conduct these projects over the course of three terms in which they take PSY 490, 491, and 492. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PSY and classification is Senior.
Prerequisites: PSY 491 [Min Grade: D]

PSY I199 Independent Study in PSY 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PSY I299 Independent Study in PSY 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PSY I399 Independent Study in PSY 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PSY I499 Independent Study in PSY 1.0-3.0 Credit
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PSY T180 Special Topics in Psychology 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PSY T280 Special Topics in Psychology 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PSY T380 Special Topics in Psychology 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

PSY T480 Special Topics in Psychology 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Public Health

Courses

PBHL 101 Public Health 101 3.0 Credits
Introduction to Public Health is a broad overview class designed to give an introduction to the core tenets of Public Health. Basic concepts covered in the class are the basic definitions and concepts related to public health. Specific areas that will be further explored in the class include, what it means to be healthy, what is public health, what are social determinants of health, what is disease prevention and health promotion and what are health inequalities among others.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit

PBHL 301 Epidemiology in Public Health 3.0 Credits
This is an introductory course designed to teach undergraduate students the basic principles and concepts of epidemiology. The course highlights the approaches used in the field of epidemiology to study disease in populations, incorporating concepts of disease causation and control.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Prerequisites: PBHL 101 [Min Grade: C]

PBHL 302 Introduction to the History of Public Health 3.0 Credits
This course considers the origins of contemporary public health by examining major currents in the history of public health in the United States from Colonial times to the present, with an emphasis on the 20th century.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Prerequisites: PBHL 101 [Min Grade: C]

PBHL 303 Overview of Issues in Global Health 3.0 Credits
This introductory course will cover the major issues and considerations involved in global health. It is a survey course that is designed to familiarize students with the major topics in the global health. The goal of the course is to provide students with an overview of concepts such as the determinants of health, the measurements of health status and global burden of the disease.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Prerequisites: PBHL 101 [Min Grade: C]

PBHL 304 Introduction to Health & Human Rights 3.0 Credits
This introductory course highlights the intrinsic link between one's health and his/her fundamental human rights. When such rights (access to medical care, housing, food, standard of living) are violated, this can lead to adverse health outcomes.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Prerequisites: PBHL 101 [Min Grade: C]

PBHL 305 Women and Children: Health & Society 3.0 Credits
This course is designed to give students a broad overview of pertinent issues surrounding the health and well being of mothers and children. The course emphasizes the inter-relationship among women's health, reproductive health and child health.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit

PBHL 306 Introduction to Community Health 3.0 Credits
This three credit course will provide the foundation for studying the root causes affecting community health in the United States, as well as broad efforts to improve world health. This course is designed to enhance oral and written communications on public health issues, advocacy, and public policy, while enhancing content, process skills, and other essential competencies.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Prerequisites: PBHL 101 [Min Grade: D]

PBHL 307 Injury Prevention and Control 3.0 Credits
Unintentional injury is the leading cause of death for people in the United States between the ages of 1 and 44. Homicide and suicide are the second and third leading cause of death for people aged 15-34. The cost of medically treated injuries is estimated at over $100 billion annually. This course examines injury as one of the core public health problems in the United States. Causes such as motor vehicles, opioids, interpersonal and self-inflicted violence, and work are some of the topics examined, including their physical and psychological outcomes. The subsequent costs and burdens to the healthcare system are explored. Policy and behavioral interventions are addressed. Where possible, extensions to international settings are made.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit

PBHL 308 The U.S. Public Health System 3.0 Credits
This course will provide students with an understanding of the organizational components of the public health system in the United States. Among the topics covered are the roles of different levels of government in the financing, delivery, and regulation of public health services and the complementary private, non-profit components of the public health system. The course addresses several current, critical public health policy issues and how different political and economic interests and actors interact in shaping public policy on these issues.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Prerequisites: PBHL 101 [Min Grade: C]

PBHL 309 Public Health Ethics 3.0 Credits
This course will explore the emergence of the public health field, its philosophical, historical, and political development, its relationship to the field of human rights and its future. Emphasis will be placed on developing a mastery of the current literature on the subject and on formulating novel approaches in public health ethics. This is a reading and writing intensive course, and students should be prepared to engage in serious dialogue each week in class.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Prerequisites: PBHL 101 [Min Grade: C]

PBHL 310 Burden of Disease 3.0 Credits
This course will cover selected topics of the burden of disease with critical review of the current public health literature. Students will have the opportunity to learn the basic concepts and methods of exploring risk factors and assessing the burden of disease at regional, national and global levels, through class lectures, group exercise and individual projects.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit

PBHL 311 Public Health Biology 3.0 Credits
This course is designed to introduce students to the biologic basics of the causes, natural history, and prevention of diseases of public health importance. An integrated perspective will be used to demonstrate the connection between exposures and cellular effects, disease processes in individuals, and population impacts. Coverage will include infectious disease transmission and prevention; cancer biology regarding etiology, prevention, and treatment; nutritional influences in obesity, diabetes and heart disease.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Prerequisites: BIO 107 [Min Grade: C] and BIO 108 [Min Grade: C] and PBHL 101 [Min Grade: C]

PBHL 312 Public Health Data Analysis 3.0 Credits
This course will introduce students to the basic concepts and methods of biostatistics as they relate to applications in public health practice and research.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Prerequisites: PBHL 101 [Min Grade: C]

PBHL 313 The Social Determinants of Health and Well-Being 3.0 Credits
The goal of this course is to introduce students to the patterning of health and well-being among social groups within and between societies, and how a social science approach can improve our understanding of health and illness at a population level, and identify possible public health strategies for reducing health disparities.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Prerequisites: PBHL 101 [Min Grade: C]

PBHL 314 Environmental and Occupational Health 3.0 Credits
The goal of this course is to provide students with basic knowledge of EOH as it applies to the practice of public health from individual, community and political perspectives. Students will also gain skills needed to understand and conduct scientific research related to EOH. Students will be expected to critically analyze EOH issues and explore appropriate responses.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Prerequisites: PBHL 101 [Min Grade: C]

PBHL 315 Public Health Leadership 3.0 Credits
This course provides students with an introduction to the environment and organizations in public health leadership. This course introduces leadership skills to lead changes in public health organizations. The cases and lectures throughout the course have been designed to develop leadership approaches for public health agencies.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Prerequisites: PBHL 101 [Min Grade: C]

PBHL 316 Drugs, Society, and Public Health 3.0 Credits
This course will examine problems associated with drug use through the prism of public health. The first half of the course will be devoted to understanding biological, psychological, social, and cultural aspects of key licit and illicit substances. The second half will focus on relevant public health aspects of drug use, including preventions, intervention, treatment, and policy. Intersecting issues include homelessness, HIV/AIDS, mental health & violence. Students will be exposed to key books and peer-reviewed articles that address these issues from a range of theoretical & analytical approaches.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit

PBHL 317 The World's Water 3.0 Credits
This course will discuss the approaches that may be taken to improve access to water and sanitation and improve public health. The course will also cover water remediation and safeguard techniques for the improvement of water quality, as well as gender and development perspectives.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Prerequisites: PBHL 101 [Min Grade: C]

PBHL 318 Violence and Trauma in Public Health 3.0 Credits
This course will focus on the public health policy and practice aspects of trauma violence and adversity. The course will begin by laying a foundation of trauma theory and then will examine the impact of emerging knowledge on individuals, communities and systems. The course will examine trauma informed models, which have been applied to individuals, communities and systems and will analyze the policy and practice implications of these models as well as the translation from research to practice.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit

PBHL 319 Nature Prescription: Trees, Green Space, and Your Health 3.0 Credits
Trees and green spaces distinctly shape the character of cities, and there is increasing evidence that vegetated landscapes also affect the health of urban residents. We will explore the relationship between vegetated landscapes and human health outcomes - from improved mental health and outdoor recreation, to benefits from 'ecosystem services' provided by trees and other vegetation. The environmental and biological mechanistic pathways leading to health effects will be delineated. Risk-benefit tradeoffs will also be considered. Also discussed will be the types of health impact data that may be useful to planners and policy makers to support decisions for installation of new parks or other urban vegetation, and a field assessment to estimate such impacts will be conducted.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit

PBHL 320 Exploring the HIV/AIDS Pandemic 3.0 Credits
This course examines the natural history, diagnosis and surveillance of HIV/AIDS. While this is an epidemiology based course, the students will also learn the basic virology of HIV, including the life cycle and genetic diversity of the virus in order to more fully describe the epidemiology of the pandemic. In addition to learning about the biology and epidemiology of the pandemic which can limit its control. Students will be responsible for reporting on a country of their choice, describing the history, epidemiology, and methods of control utilized by that country.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Prerequisites: BIO 107 [Min Grade: C-] and PBHL 302 [Min Grade: C-] and PBHL 311 [Min Grade: C-]

PBHL 321 Disease Outbreak Investigations 3.0 Credits
The emergence of new pathogens and drug resistance, as well as increased transmission opportunities caused by globalization has led to a rising prevalence of new infectious diseases as well as reemergence of older diseases. this course will focus on the surveillance, identification, control, and prevention of selected infectious diseases of Public Health importance both globally and within the U.S. Specific areas that will be addressed include the causative agents, the routes of transmission, the host responses, environmental factors, unique risk factors, outbreak investigations, surveillance and strategies for control and prevention. We will incorporate the history of communicable disease control efforts where relevant and discuss the role of increased globalization in the spread of infectious diseases.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Prerequisites: BIO 107 [Min Grade: C] or BIO 122 [Min Grade: C]

PBHL 332 Autism as a Public Health Challenge 3.0 Credits
Demonstrates how to apply public health concepts to an important
societal challenge that is quite distinct from those more commonly thought
of as public health problems (like infectious diseases, chronic diseases,
and injuries). Students will be introduced to autism spectrum disorders
from a variety of perspectives and will gain skill and experience distilling
and communicating information relevant to understanding and explaining
the public health challenges related to autism spectrum disorders and the
ways we are working toward solutions.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Prerequisites: PBHL 301 [Min Grade: C] and PBHL 302 [Min Grade: C]

PBHL 333 Health Inequality 3.0 Credits
This course addresses questions related to health inequalities—the
systematic and avoidable differences in the health of social groups (e.g.,
racial, ethnic, gender, socioeconomic, sexual orientation) in a society.
This multidisciplinary course integrates knowledge from the fields of
public health, biology, medicine, sociology, psychology, political science,
and history to provide students with a cohesive understanding of the
magnitude of health inequalities in societies, the processes through which
they are produced, the meth.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Prerequisites: PBHL 101 [Min Grade: C]

PBHL 497 Capstone Experience I 3.0 Credits
The senior capstone is a progressive 3-quarter experience with cross
cutting competencies for graduating public health major seniors to provide
them with an individualized learning experience of breadth and depth.
Students will work with faculty members to design a project that will
fulfill both his/her public health interests as well as the broader capstone
objectives. Students will participate in in-class learning with other public
health majors to acquire foundational concepts, which they can apply to
their individualized project.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: PBHL 301 [Min Grade: C-] and PBHL 302 [Min Grade: C-]
and PBHL 303 [Min Grade: C-] and PBHL 304 [Min Grade: C-] and PBHL
306 [Min Grade: C-] and PBHL 308 [Min Grade: C-] and PBHL 309 [Min
Grade: C-] and PBHL 311 [Min Grade: C-] and PBHL 312 [Min Grade: C-]
and PBHL 313 [Min Grade: C-] and PBHL 314 [Min Grade: C-] and PBHL
315 [Min Grade: C-] and PBHL 317 [Min Grade: C-]

PBHL 498 Capstone Experience II 3.0 Credits
The senior capstone is a progressive 3-quarter experience with cross
cutting competencies for graduating public health major seniors to provide
them with an individualized learning experience of breadth and depth.
Students will work with faculty members to design a project that will
fulfill both his/her public health interests as well as the broader capstone
objectives. Students will participate in in-class learning with other public
health majors to acquire foundational concepts, which they can apply to
their individualized project.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: PBHL 301 [Min Grade: C-] and PBHL 302 [Min Grade: C-]
and PBHL 303 [Min Grade: C-] and PBHL 304 [Min Grade: C-] and PBHL
306 [Min Grade: C-] and PBHL 308 [Min Grade: C-] and PBHL 309 [Min
Grade: C-] and PBHL 311 [Min Grade: C-] and PBHL 312 [Min Grade: C-]
and PBHL 313 [Min Grade: C-] and PBHL 314 [Min Grade: C-] and PBHL
315 [Min Grade: C-] and PBHL 317 [Min Grade: C-]

PBHL 499 Capstone Experience III 3.0 Credits
The senior capstone is a progressive 3-quarter experience with cross
cutting competencies for graduating public health major seniors to provide
them with an individualized learning experience of breadth and depth.
Students will work with faculty members to design a project that will
fulfill both his/her public health interests as well as the broader capstone
objectives. Students will participate in in-class learning with other public
health majors to acquire foundational concepts, which they can apply to
their individualized project.
College/Department: Dornsife School of Public Health
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: PBHL 301 [Min Grade: C-] and PBHL 302 [Min Grade: C-]
and PBHL 303 [Min Grade: C-] and PBHL 304 [Min Grade: C-] and PBHL
306 [Min Grade: C-] and PBHL 308 [Min Grade: C-] and PBHL 309 [Min
Grade: C-] and PBHL 311 [Min Grade: C-] and PBHL 312 [Min Grade: C-]
and PBHL 313 [Min Grade: C-] and PBHL 314 [Min Grade: C-] and PBHL
315 [Min Grade: C-] and PBHL 317 [Min Grade: C-]

PBHL I199 Independent Study in PBHL 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Dornsife School of Public Health
Repeat Status: Can be repeated multiple times for credit

PBHL I299 Independent Study PBHL 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Dornsife School of Public Health
Repeat Status: Can be repeated multiple times for credit

PBHL I399 Independent Study in PBHL 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Dornsife School of Public Health
Repeat Status: Can be repeated multiple times for credit

PBHL I499 Independent Study in PBHL 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Dornsife School of Public Health
Repeat Status: Can be repeated multiple times for credit

PBHL T180 Special Topics in PBHL 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Dornsife School of Public Health
Repeat Status: Can be repeated multiple times for credit

PBHL T280 Special Topics in PBHL 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Dornsife School of Public Health
Repeat Status: Can be repeated multiple times for credit

PBHL T380 Special Topics in PBHL 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Dornsife School of Public Health
Repeat Status: Can be repeated multiple times for credit

PBHL T480 Special Topics in PBHL 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Dornsife School of Public Health
Repeat Status: Can be repeated multiple times for credit

Real Estate

Courses

REAL 310 Introduction to Real Estate 3.0 Credits
This course provides the foundation for understanding the Real Estate business with a survey of development, land use, planning, property rights, leases, deeds, contracts, mortgages, time value of money and insurance.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: ACCT 115 [Min Grade: D] or ACCT 110 [Min Grade: D]

REAL 320 Real Estate Law - Principle & Practice 3.0 Credits
This course will explore the unique legal requirements of the real estate business including property rights, involuntary transfers, easements, private restrictions, public restrictions, zoning and land development laws.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

REAL 330 Facilities & Property Management 3.0 Credits
This course will explore fundamental issues, principles, and practices of facilities and property management to develop and maintain built environments that are productive, safe, comfortable, sustainable, and maximize the return on fixed assets and resources.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

REAL 470 Real Estate Investments - Market & Feasibility Analysis 3.0 Credits
This course will introduce and explore the market analysis and feasibility methods in framing and supporting investment decision making for real estate projects.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

REAL 471 Advanced Real Estate in Investment & Analysis 3.0 Credits
This course will explore the market analysis and feasibility methods in framing and supporting investment decision making for real estate projects. Detailed market analysis strategies will be employed and case studies will be analyzed to deepen the students's knowledge and judgement for investment decision making.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: REAL 470 [Min Grade: D]

REAL 472 Advanced Market Research & Analysis 3.0 Credits
This course will explore the market research methods used to understand and dissect geographical and demographical real estate markets. Detailed market research strategies will be employed and case studies will be analyzed to deepen the student¿s knowledge of market research techniques and resources.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: REAL 470 [Min Grade: D]

REAL 473 Sales & Marketing of Real Estate 3.0 Credits
This course will explore the strategies for successful marketing of real property bases on market research and development strategies.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

REAL 474 Real Estate Economics in Urban Markets 3.0 Credits
This course will offer a unique and detailed perspective on urban real estate development and the special sub-markets in which they exist. Attention will be given to the characteristics of the particular economic factors relevant in urban real estate markets.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

REAL 476 Real Estate Valuation & Analysis 3.0 Credits
This course will introduce the concepts of real estate valuation, appraisals, and the relationship of these to financing and cash requirements.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

REAL I199 Independent Study in Real 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

REAL I299 Independent Study in Real 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

REAL I399 Independent Study in Real 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

REAL I499 Independent Study in Real 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

REAL T180 Special Topics in REAL 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

REAL T280 Special Topics in REAL 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

REAL T380 Special Topics in REAL 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

REAL T480 Special Topics in REAL 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Engineering
Repeat Status: Can be repeated multiple times for credit

Real Estate Management & Development

Courses

REMD 110 Introduction to Real Estate Management 4.0 Credits
Introduces real estate management and its evolution into a multi-billion dollar professional industry. Real estate management topics include career opportunities, operations, finance, marketing, risk management, landlord-tenant laws, and Fair Housing Act. Examines the competencies necessary for operating and managing real estate investment properties, including detailed examination of leadership, operational policies, contract management, and financial aspects of multifamily, office, and industrial properties.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

REMD 320 Sustainability in the Built Environment 4.0 Credits
Integration of sustainable practices in the built environment, including energy and environmental resource efficiencies, are examined and evaluated in the planning, design, development, renovation, construction, and management of real estate investment assets. The impact of resiliency on real estate, community development, and city planning is also examined.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

REMD 375 Real Estate Finance 4.0 Credits
Surveys all methods of financing real estate. Topics covered include funding sources, interest rates; cost of funds; taxation; capitalization rates; mortgages; secondary mortgage markets; governmental financial agencies; leverage and property valuation; and real estate in a portfolio context. Decision-making models, pro-forma analysis, lease valuation, and feasibility analysis for various types of properties are employed.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: FIN 301 [Min Grade: C]

REMD 410 Real Estate Investment and Asset Management 4.0 Credits
Examines the fundamentals of finance as it applies to real estate investment and asset management. Identifies the skills necessary to maximize the value of real estate assets through effective operations and financial management practices. Topics include detailed study and analysis of ownership objectives of real estate investors and financial reporting, including acquisitions, dispositions, and new development. Provides tools and decision-making models to manage asset performance, including revenue maximization, property valuation, operating budgets, pro formas, net operating income, cash flow, internal rate of return, and return on investment.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: REMD 110 [Min Grade: C] and FIN 301 [Min Grade: C] and REMD 375 [Min Grade: C]

REMD 491 Senior Capstone in Real Estate Management & Development 4.0 Credits
An overview of current issues affecting real estate management, e.g. ethics, social justice, legislation, human resources, environmental, and economic. Decision-making and professional management practices are also examined. Experiential learning occurs throughout the course via strategic in-depth research and analysis of a multifamily rental investment asset. The course culminates with the development of a Management Plan for the multifamily rental investment asset. Students will work with faculty to design a Management Plan that will fulfill both his/her real estate management interests as well as the broader capstone objectives.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is REAL and classification is Senior.
Prerequisites: REMD 110 [Min Grade: C] and REMD 375 [Min Grade: C] and FIN 301 [Min Grade: C]

REMD I199 Independent Study in REMD 0.0-12.0 Credits
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

REMD I299 Independent Study in REMD 0.0-12.0 Credits
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

REMD I399 Independent Study in REMD 0.0-12.0 Credits
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

REMD I499 Independent Study in REMD 0.0-12.0 Credits
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

REMD T180 Special Topics in REMD 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

REMD T280 Special Topics in REMD 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

REMD T380 Special Topics in REMD 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

REMD T480 Special Topics in REMD 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

Religious Studies

Courses

RELS T280 Special Topics in Religious Studies 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study. May be repeated for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 108 credits

RELS T380 Special Topics in Religious Studies 1.0-12.0 Credit
Topics decided upon by faculty will vary within the area of study. May be repeated for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 108 credits

Retail Leadership

Courses

RETL 315 Power of Retail Brands 3.0 Credits
This course provides an in-depth analysis of theoretical and applied branding techniques. Retail marketing, merchandising, and in-store brand representatives will be analyzed to recognize the detailing necessary to create a successful retail brand. Students will read branding studies to comprehend why the phenomena of branding has encompassed our consumer society.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

RETL 325 Applied In-Store Visual Strategies 3.0 Credits
Provides students with an understanding of how retailers use visual display to gain retail market share. Students will examine various types of visual display and how this impacts the retail environment.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

RETL 400 Retail Leadership Capstone 3.0 Credits
This course will provide students practical experience leading all aspects of a retail establishment. Topics covered include customer service, human resources, planogram/floorset, visual merchandising/display, sales and completing the sale, merchandising the store, quality of merchandise/product, leadership responsibilities, and future goals.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: DSMR 231 [Min Grade: C] and DSMR 232 [Min Grade: C]

RETL I199 Independent Study in RETL 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

RETL I299 Independent Study in RETL 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

RETL I399 Independent Study in RETL 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

RETL I499 Independent Study in RETL 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

RETL T180 Special Topics in Retail Leadership 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

RETL T280 Special Topics in Retail Leadership 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

RETL T380 Special Topics in Retail Leadership 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

RETL T480 Special Topics in Retail Leadership 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Russian

Courses

RUSS 101 Russian I 4.0 Credits
Introductory Russian. Includes listening, speaking, and reading, with individual audiolingual practice. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

RUSS 102 Russian II 4.0 Credits
Continues RUSS 101. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: RUSS 101 [Min Grade: C]

RUSS 103 Russian III 4.0 Credits
Continues RUSS 102. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: RUSS 102 [Min Grade: C]

RUSS 201 Russian IV 4.0 Credits
This courses includes listening, speaking, reading, and writing practice, with a focus on cultural competency and conversational skills. Builds on Russian 103.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: RUSS 103 [Min Grade: C]

RUSS 202 Russian V 4.0 Credits
This course includes listening, speaking, reading, and writing practice, with a focus on cultural competency and conversational skills. Builds on Russian 201.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: RUSS 201 [Min Grade: C]

RUSS 310 Advanced Writing & Speaking 4.0 Credits
Provides advanced practice in written and oral communication, including journalistic, professional, and creative writing. Examines contemporary cultural contexts through media and news. Taught in Russian.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: RUSS 202 [Min Grade: C]

RUSS 480 Russian Minor Thesis Course 0.5-4.0 Credits
Independent research study on a topic selected by the student. Independent study is supervised by a faculty member and guided by a plan of study. At the end of the course, the student is required to produce a paper and oral defense on the topic of his paper.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

RUSS I199 Independent Study in RUSS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

RUSS I299 Independent Study in RUSS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

RUSS I399 Independent Study in RUSS 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

RUSS I499 Independent Study in RUSS 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

RUSS T180 Special Topics in Russian 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

RUSS T280 Special Topics in Russian 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

RUSS T380 Special Topics in Russian 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

RUSS T480 Special Topics in Russian 0.5-12.0 Credits
Recommended for Russian minors and for students with proficiency status.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

STEM Teacher Education

Courses

ESTM 201 DragonsTeach: Step 1 1.5 Credit
This course is an introduction to mathematics, computer science, and science teaching as a career. Discussions include standards-based lesson design and various teaching and behavior management strategies. Fieldwork consists of planning and teaching two inquiry-based lessons to students in local elementary schools. Fieldwork in local schools is required.
College/Department: School of Education
Repeat Status: Not repeatable for credit

ESTM 210 DragonsTeach: Step 2 1.5 Credit
Topics include routes to teacher certification in mathematics, computer science, and science teaching; various teaching methods that are designed to meet instructional goals; and learner outcomes. Students develop and teach two inquiry-based lessons in their field in a middle school, and participate in peer coaching. Fieldwork in local schools is required.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: ESTM 201 [Min Grade: B]

ESTM 301 Knowing and Learning in Mathematics and Science 3.0 Credits
The course focuses on what it means to know and learn mathematics and science, how this knowledge changes over time and how it develops in learners. Topics include foundations of STEM education; problem solving in mathematics and science education utilizing technology; principles of expertise and novice understanding of subject matter. The course also serves to set the stage for field experiences in ESTM 302 and will involve fieldwork in local schools.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: ESTM 210 [Min Grade: B] (Can be taken Concurrently)ESTM 201 [Min Grade: B]

ESTM 302 Classroom Interactions 3.0 Credits
Classroom Interactions builds on previous DragonsTeach courses and continues the process of preparing students to teach mathematics and science in upper elementary and secondary settings by providing opportunities to see how theories explored in Knowing and Learning play out in instructional settings. Students design and implement instructional activities informed by their own understanding of what it means to know and learn mathematics and science, and then evaluate the outcomes of those activities on the basis of student artifacts (i.e., what students say, do, or create). The course will involve fieldwork in local schools.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: ESTM 301 [Min Grade: B]

ESTM 303 Research and Practice in Science and Mathematics Education 3.0 Credits
The course focuses on research and practice in science and mathematics education and supports students as they connect the two in the context of their classroom. Typical topics include assessment and evaluation, technology, equitable STEM instruction and learning environments and additional current topics in STEM Education. Students will gain experience as practitioner-researchers through observation and fieldwork in local schools.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: ESTM 302 [Min Grade: B]

ESTM 342 Teaching Engineering Concepts to Children 3.0 Credits
This course is designed to provide elementary educators with the background knowledge and experiences that will enhance their ability to teach engaging, effective, and meaningful engineering lessons. These include: trends and issues in 21st century engineering education; best practices pedagogies in engineering education; connections and integration between engineering curriculum and other content areas; engineering design practices; planning, managing, implementing, and assessing engineering lessons; safety in engineering classrooms; the use of technology to enhance engineering instruction; and how to engage all learners in positive classroom engineering experiences.
College/Department: School of Education
Repeat Status: Not repeatable for credit

ESTM 350 Project-Based Instruction 4.0 Credits
Project-based instruction engages learners in exploring authentic, important, and meaningful questions of real concern to students. Through a dynamic process of investigation and collaboration and using the same processes and technologies that scientists, mathematicians, and engineers use, students work in teams to formulate questions, make predictions, design investigations, collect and analyze data, make products and share ideas. Students learn fundamental concepts and principles that they apply to their daily lives. Project-based instruction promotes equitable and diverse participation and engages students in learning. In this class you will develop a complete unit as opposed to individual lessons in preparation for apprentice teaching. This course involves fieldwork in local schools.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: ESTM 302 [Min Grade: B] (Can be taken Concurrently)ESTM 201 [Min Grade: B] and ESTM 210 [Min Grade: B]

ESTM 362 Perspectives in Science and Mathematics Education 3.0 Credits
In this course, students will gain expertise in how to incorporate the history of science (defined as the life and physical sciences and mathematics) into primary and secondary education curricula. Based on a survey of the major transitions and examples in the history of science from the Renaissance to Modernity, students will gain a unique perspective on historical methodology, the content of science, and creativity in scientific research. These lessons will support student teachers in developing unique Science and Mathematics courses that are founded on their new historical perspective.
College/Department: School of Education
Repeat Status: Not repeatable for credit

ESTM 364 Methods of Research and Inquiry in Science and Mathematics 3.0 Credits
This course is an introduction to analysis of current topics in science and engineering and serves as an introduction to teaching and learning research-based courses. The intended audience is undergraduate students from all STEM areas and particularly those interested in STEM Education. Through quantitative analysis, the students will experience first-hand the societal, environmental, financial, economic, and technological impacts of scientific, engineering and business processes. The course requires procuring data, analyzing large-scale data sets using statistical software applications, synthesizing qualitative information using quantitative results, presentation of research, results, conclusions, and developing instruction that supports students' engagement in similar practices.
College/Department: School of Education
Repeat Status: Not repeatable for credit

ESTM 409 Student Teaching Seminar 3.0 Credits
This seminar course is designed to compliment the Student Teaching capstone, field experience by developing the pre-service teacher's teaching knowledge and strengths throughout their field placement, supervision, and reflective practice. The goal of the seminar is to create reflective practitioners by providing a forum for collaborative, critical inquiry based on the field experience.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

ESTM 410 DragonsTeach Student Teaching 6.0 Credits
DragonsTeach Student Teaching is the capstone course of the DragonsTeach program, providing the opportunity for STEM majors to earn both their degree and Pennsylvania Instructional I certification to teach at the secondary level (middle or high school). Student teaching allows will experience the day-to-day responsibilities of the professional middle or high school math or science teacher and demonstrate the competencies needed for certification. In addition to extensive fieldwork, student teachers meet as a group for a weekly seminar.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: ESTM 350 [Min Grade: B]

ESTM I199 Independent Study in ESTM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

ESTM I299 Independent Study in ESTM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

ESTM I399 Independent Study in ESTM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

ESTM I499 Independent Study in ESTM 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

ESTM T180 Special topics in ESTM 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

ESTM T280 Special topics in ESTM 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

ESTM T380 Special topics in ESTM 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

ESTM T480 Special topics in ESTM 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

Screenwriting & Playwriting

Courses

SCRP 150 Entertainment Storytelling Fundamentals 3.0 Credits
This course introduces students to the core building blocks of "story" from the perspective of the entertainment industry, where stories are produced for mediums other than literary: film, television, the stage, graphic novels, or video games. Through readings, lectures, discussions and screenings, the class delves into the unique considerations of stories created or adapted for production as visual entertainment artifacts. Analytic examinations of core story-telling differences between various mediums will also be highlighted, to give students insight in later production and studies courses in their chosen medium of expression.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

SCRP 220 Playwriting I 3.0 Credits
Introduces the basic tenets of playwriting and applies their use towards the writing of a 10-minute play.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

SCRP 225 Playwriting II 3.0 Credits
Builds on the writing tenets learned in Playwriting I. Requires students to write a one-act play.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: SCRP 220 [Min Grade: D]

SCRP 230 Page to Stage 3.0 Credits
Students will write a short play and then go through the rewrite process while working with a director and student actors. The final scenes will be performed in front of an audience.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 2 times for 9 credits
Prerequisites: SCRP 225 [Min Grade: C]

SCRP 241 Writing TV Comedy 3.0 Credits
Teaches the essentials of situation comedy writing for TV. Students will be expected to conceive and write their own thirty-minute pilot script plus a 'bible' for their show.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: SCRP 270 [Min Grade: D]

SCRP 242 Writing TV Drama 3.0 Credits
Teaches the essentials of writing the one-hour television drama. Students will be expected to conceive and write their own thirty-minute pilot script plus a 'bible' for their show.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: SCRP 270 [Min Grade: D]

SCRP 250 Creating Stand-up Comedy 3.0 Credits
Deals with the conception, writing and performance of a stand-up comedy routine. Includes exploration of creating a comic persona, structuring an act, construction of jokes, and aspects relating to perfromance. "Final exam" will be given before a live audience at a public venue.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

SCRP 260 Writing Comics 3.0 Credits
This course will introduce the student to the history, theory, language and disciplines of writing the American comic book and graphic novel. Students will learn about comic script-writing formats, the collaborative relationship between writer and artist, and techniques to strengthen both their writing and critiquing abilities.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: SCRP 270 [Min Grade: C]

SCRP 263 Comic Book Editing 3.0 Credits
Students will write original work and serve as editors for other students on their creative project -- all while learning the histories of the creative disciplines that facilitate the creation of a modern comic book.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: SCRP 260 [Min Grade: C]

SCRP 266 Graphic Novel Art and Industry 3.0 Credits
This course serves as an comprehensive look at the medium of graphic novels: their history, how they're made, their diversity, how they are designed, sold and marketed. The course will mix reading and analysis of select titles, lecture and discussions with industry experts, including an artist, author, agent, editor, publisher, retailer, and designer.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: SCRP 260 [Min Grade: C]

SCRP 270 [WI] Screenwriting I 3.0 Credits
Workshop course that covers the fundamentals of writing scripts for film and television. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: HUM 106 [Min Grade: D] or ENGL 101 [Min Grade: D] or ENGL 105 [Min Grade: D]

SCRP 275 [WI] Screenwriting II 3.0 Credits
Workshop course that builds on the fundamentals of screenwriting learned in Screenwriting I. Each student develops and completes a short dramatic screenplay. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: SCRP 270 [Min Grade: D]

SCRP 280 [WI] Writing the Short Film 3.0 Credits
This course will focus on creating scripts for films under thirty minutes in length. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: SCRP 270 [Min Grade: D]

SCRP 290 Game: Universe & Story 3.0 Credits
A non-technical course which examines the differences between film & TV works vs. games and interactive fiction forms, and the creative changes inherent in translating one to the other. Emphasis given to the creation of a vibrant, seductive, logically consistent game world. Course culminates in the design of a game based on an existing work of fiction.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: SCRP 270 [Min Grade: C]

SCRP 295 Future of Narrative Games 3.0 Credits
Encourages students to use their knowledge of the current state of the art in gaming, and their technical and writing interests and expertise, to imagine games that go beyond those currently available. Of particular interest are ways to create branching narratives that deliver the story satisfaction and character development expected from traditional media.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: SCRP 270 [Min Grade: C]

SCRP 310 Literature for Screenwriters 3.0 Credits
This course provides exposure to literary traditions from the classics to pop culture, analyzing how the selected books have affected the film industry, both in terms of direct adaptations and by influencing generations of filmmakers and screenwriters.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: SCRP 270 [Min Grade: D] or FMVD 270 [Min Grade: D]

SCRP 350 TV Comedy Practicum 3.0 Credits
Students will write episodes of an ongoing TV comedy series produced at Drexel. Following the network primetime model and working in collaboration, students will work under budget, production and deadline constraints similar to those in the real world.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 1 times for 6 credits
Prerequisites: SCRP 270 [Min Grade: C]

SCRP 353 TV Drama Practicum 3.0 Credits
Students will write episodes of an ongoing TV drama series to be produced at Drexel. Following the network primetime model and working in collaboration, students will work under budget, production and deadline constraints similar to those in the real world.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 1 times for 6 credits
Prerequisites: SCRP 270 [Min Grade: C]

SCRP 360 An Evening With... 3.0 Credits
Students are given the opportunity to interact with show business creative professionals, including writers, actors, directors, animators, editors and others. Guests will present their work and then discuss it in a free-form Q&A session.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

SCRP 370 Screenplay Story Development 3.0 Credits
This course provides a thorough understanding of methods used to develop story ideas from initial concept to complete screen story, including pitching, structuring, and creating treatments. Students pitch and develop several stories which can then be used to create full-length scripts in advanced workshops.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: SCRP 270 [Min Grade: D]

SCRP 377 Game Writing Workshop I 3.0 Credits
This course embeds Screenwriting students on a team developing a computer game from concept to design document and through production. Screenwriting majors will be expected to contribute heavily to the narrative, character and other non-technical aspects of game creation.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: SCRP 290 [Min Grade: C] and SCRP 295 [Min Grade: C]

SCRP 378 Game Writing Workshop II 3.0 Credits
This course embeds Screenwriting students on a team developing a computer game from concept to design document and through production. Screenwriting majors will be expected to contribute heavily to the narrative, character and other non-technical aspects of game creation.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: SCRP 377 [Min Grade: C]

SCRP 380 Screenwriting Workshop I 3.0 Credits
The first of a two-course sequence in which students write a feature film script, telefilm, or television pilot.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 1 times for 6 credits
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: SCRP 275 [Min Grade: D]

SCRP 381 Screenwriting Workshop II 3.0 Credits
The second of a two-course sequence in which students write a feature film script, telefilm, or television pilot.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 1 times for 6 credits
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: SCRP 380 [Min Grade: D]

SCRP 382 Playwriting Workshop I 3.0 Credits
The first of a two-course sequence in which students write a 90-minute, two-act play.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 1 times for 6 credits
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: SCRP 225 [Min Grade: D]

SCRP 383 Playwriting Workshop II 3.0 Credits
The second of a two-course sequence in which students write a 90-minute, two-act play.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 1 times for 6 credits
Prerequisites: SCRP 382 [Min Grade: D]

SCRP 384 Comic/Graphic Novel Writing Workshop I 3.0 Credits
This two-term workshop will lead you through the process of developing and writing at least one draft of the script for either several issues of an original comic or a complete graphic novel. The finished script will be expected to conform to professional standards in everything from length to plot structure to formatting. You will be expected to utilize skills taught in the prerequisite course, SCRP 260 (Comic Book Writing), as well as narrative skills learned in SCRP 270 (Screenwriting I), including, but not limited to, thinking visually, establishing characters through behavior, writing effective dialogue, the basics of story structure, and related topics.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: SCRP 266 [Min Grade: C]

SCRP 385 Comic/Graphic Novel Writing Workshop II 3.0 Credits
This two-term workshop will lead you through the process of developing and writing at least one draft of the script for either several issues of an original comic or a complete graphic novel. The finished script will be expected to conform to professional standards in everything from length to plot structure to formatting. You will be expected to utilize skills taught in the prerequisite course, SCRP 260 (Comic Book Writing), as well as narrative skills learned in SCRP 270 (Screenwriting I), including, but not limited to, thinking visually, establishing characters through behavior, writing effective dialogue, the basics of story structure, and related topics.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: SCRP 384 [Min Grade: C]

SCRP 399 Independent Study in SCRP 0.5-12.0 Credits
Independent study on a topic selected by the student. Independent study is supervised by a faculty member and guided by a plan of study. Department permission required.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

SCRP 495 Senior Project in Dramatic Writing I 3.0 Credits
The first of a three-course sequence in which students write a feature film script, telefilm, full-length stage play, television pilot, at least two spec episodes of an existing one-hour TV drama or four of an existing TV comedy.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: SCRP 381 [Min Grade: D] or SCRP 383 [Min Grade: D]

SCRP 496 Senior Project in Dramatic Writing II 3.0 Credits
The second of a three-course sequence in which students write a feature film script, telefilm, television pilot, at least two spec episodes of an existing one-hour TV drama or four of an existing TV comedy.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: SCRP 495 [Min Grade: D]

SCRP 497 Senior Project in Dramatic Writing III 3.0 Credits
The thid of a three-course sequence in which students write a feature film script, tlelfilm, full-length stage play, television pilot, at least two spec episodes of an existing one-hour TV drama or four of an existing TV comedy.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: SCRP 496 [Min Grade: D]

SCRP I199 Independent Study in Screenwriting & Playwriting 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

SCRP I299 Independent Study in Screenwriting & Playwriting 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

SCRP I399 Independent Study in Screenwriting & Playwriting 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

SCRP I499 Independent Study in Screenwriting & Playwriting 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

SCRP T180 Special Topics in Screenwriting & Playwriting 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

SCRP T280 Special Topics in Screenwriting & Playwriting 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

SCRP T380 Special Topics in Screenwriting & Playwriting 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

SCRP T480 Special Topics in Screenwriting & Playwriting 3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Sociology

Courses

SOC 101 Introduction to Sociology 3.0 Credits
Introduction to what sociology is and what it studies. Topics will include socialization, group dynamics, gender roles, structural inequality, race and ethnic group relations, stratification, deviance, and population studies. Special attention will be paid to core social institutions (e.g. family, education, religion, political and economic systems) as well as theories and methods that guide sociological investigation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 115 Social Problems 4.0 Credits
Provides a sociological analysis into the causes and possible cures for a variety of social problems. Focuses on topics such as unemployment, crime, poverty, corporate concentration of wealth and power, racism, immigration, health care, and environmental degradation.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 205 Criminology & Criminal Justice 3.0 Credits
Introduces the scientific study of crime and criminals. Analyzes the theoretical and empirical literature on causation and control. Examines our criminal justice system and approaches to corrections.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 210 Race, Ethnicity and Social Inequality 4.0 Credits
Examines cultural diversity, racial and ethnic identity; racism, discrimination and prejudice, as well as minority-majority group relations both globally and at home. Special attention will be paid to the history and present status of various major racial and ethnic groups in the United States including African Americans, Latinos, Asian Americans as well as "white" ethnicities.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 215 Sociology of Work 4.0 Credits
Examines the transformation of work in 21st century America. Focuses on problems of the "post industrial" workforce: big service sector, shrinking real wages, huge growth in temporary and part-time jobs. Special attention to global factors affecting the career path of recent college graduates.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 220 Wealth and Power 4.0 Credits
Examines the extent of differences in wealth and political power in modern society and looks at the origins and implications of those differences.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 221 Sociology of the Family 4.0 Credits
Examines structure and functions of the family and the roles, relationships, problems, and opportunities of family living from a variety of perspectives. Uses lectures, field experiences, and discussion.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 222 Sex and Society 4.0 Credits
This course examines how sexualities are socially produced and re-produced. Topics of study include gender and sexuality; changing social meanings of variant sexual orientations and practices; the effect of birth-control technologies, sexually transmitted infections and sexual violence on sexual norms; the commodification of sex and the social control of sex.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 230 Gender and Society 4.0 Credits
Explores the status and roles of modern women and men, with emphasis on changes in family relationships, career options, and lifestyle alternatives.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 235 Sociology of Health and Illness 4.0 Credits
Examines the history, economics, and politics of our health-care system and the effects of technology on the quality of health care.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 238 Sociology of Health Professions 4.0 Credits
During this course, we will explore the health professions from a sociological perspective. We will apply major sociological theories about the formation of professions, the socialization of its members, and the dynamics of change in the professions to medical doctors, nurses, and the allied health professions. We will also examine the implications for policy based on this research.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 240 Urban Sociology 4.0 Credits
Provides an overview of the contemporary process of urban change and of key problems and policy issues. Concentrates on five concerns: the evolution of urban economics; life and culture in the city today; race, ethnicity, gender, and class of urban populations; urban politics and social forces; and new directions in urban development.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

SOC 241 Research Design: Qualitative Methods 4.0 Credits
This class will provide an in-depth exploration of sociological research design and qualitative methods. Participants will grapple with issues of sampling, validity, human subjects ethics, recruitment, generalizability, and extendibility. Students will learn how to design interview guides and conduct research interviews. Introductory information on focus groups, fieldwork, action research, and archival research will be presented. Students will also learn how to use NVivo, a software package, to analyze interview data, including mixed-methods applications.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 242 Research Design: Quantitative Methods 4.0 Credits
This course provides an introduction to the quantitative methods, techniques and statistical analysis of social science data. The first part of the course broadly covers methodology, including research design, measurement, sampling, and ethical considerations in research. The second part of the course provides a practical, "hands-on" experience with data management, organization, and analysis of social science data, as well as the appropriate interpretation, communication, and presentation of statistical results. Topics include: frequency distributions, cross-tabulations, T-Tests, correlation and bivariate regression, inferences, and hypothesis/significance testing. Statistical software, such as SPSS or R Open-Source, are used for the analysis of data from a variety of social science datasets. While no strong.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 244 Sociology of the Environment 4.0 Credits
This course examines environmental problems through a sociological lens, and focuses on the ways that social practices, social structures and economic and political systems drive environmental change, degradation and preservation. We will explore the following questions: Why do humans keep re-creating environmental problems that threaten human and ecosystem survival even with the development of advanced technologies? What are the social barriers that stand in the way of solving the environmental problems of the twenty-first century? What has kept environmental movements from enjoying more success?.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

SOC 268 Sociology of Sport 4.0 Credits
The course examines the cultural and social aspects of sport. Students will be introduced to sport as a ubiquitous institution in American society as well as the essential characteristics and functions of sport from both a sociological and historic perspective.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 271 Sociology of Aging 4.0 Credits
Introduces the multidisciplinary scientific study of the causes and consequences of aging, its history, methods of research, major theoretical approaches, and empirical findings.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 276 Global Climate Change 3.0 Credits
This course will examine the environmental issue of global warming from a number of disciplinary perspectives. The course starts with an overview of the scientific evidence for global warming. It then provides an overview of the impacts of global warming on natural systems, biodiversity, and human health. It also defines the notion of "dangerous anthropogenic climate change, and the possibilities for preventing this from occurring. It explores policy options regarding both the mitigation of CO2 emissions and adaptation of societal practices and infrastructure to a continually warming globe. The course then examines the political and cultural dynamics of society's response to global warming. The course concludes with a consideration of the political actions now underway by social movements to mobilize politica.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 313 Sociology of Global Health 4.0 Credits
This course introduces students to a sociological perspective for understanding global health, healing, and medicine from individual experiences in local circumstances to practices that affect communities and societies throughout the world. It situates health and health care within cultural, social, historical, economic and political circumstances and addresses these topics in settings that are primarily outside the United States.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

SOC 315 HIV/AIDS and Africa 4.0 Credits
This course focuses on the social construction of HIV/AIDS – it explores the culture, social, epidemiologic, political, psychological, philosophical, economic, public health, and public policy dimensions of HIV/AIDS on a global level, especially in sub-Saharan Africa. Students examine case studies, interviews and documentaries on HIV/AIDS in Africa.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: SOC 101 [Min Grade: D]

SOC 318 Social Networks and Health 4.0 Credits
This course introduces social network analysis to undergraduate students, emphasizing its theoretical, substantive, and methodological foundations. It shows how social networks (types, manner, size and strength, and other dimensions of interpersonal connections) affect a wide array of health outcomes including, illness (flu, STDs, depression), access to and utilization of health information and resources. Students will acquire a sufficient grasp of both the classical and the contemporary network literatures to enable them pursue independent advanced study in social network analysis.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 320 Sociology of Deviance 4.0 Credits
Examines theories of deviance and social control, focusing on their attribution of causation and the implications for control at both the individual and societal levels. Includes study of the social construction and maintenance of deviant identities and forms of deviance such as mental disorders, alcohol use, and crime.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

SOC 330 Development and Underdevelopment in the Global South 4.0 Credits
Focuses on the ways in which the international economy affects the class structure, politics, and development of developing nations. Focuses particularly on multinational corporations and on the successes and failures of import-substitution and export-oriented industrialization programs.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

SOC 335 Sociology of Education 3.0 Credits
Provides a general introduction to the sociology of education through the study of social, political, and cultural forces operating on public education in the United States and Britain. Examines theories, methods, and case studies to explore issues of identity formation, inequality, and class reproduction in an attempt to understand the role of schooling in contemporary life.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 340 Globalization 4.0 Credits
This course investigates the causal factors for the emergence of what is known as globalization, global economy, global village, etc. It covers the effects of global changes on national political systems, on ecology and on local cultures. The role of the US and reactions to the new world order will also be considered.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

SOC 341 Environmental Movements in America 4.0 Credits
Focuses on key collective actors and institutions that are involved in the creation of U.S. environmental policies, including historical and cultural processes of change involving social movements, environmental advocacy organizations, foundations, and the media.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

SOC 346 Environmental Justice 4.0 Credits
Focuses on the political economy of environmental injustice and the impact of social movements addressing it; impact of chemical pollutants on human health; and the scientific and legal issues surrounding the study and regulation of pollutants.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 349 Sociology of Disasters 4.0 Credits
Focuses on social aspects of disasters, such as: collective behaviors (panic, crime, improvisation); warning, evacuation and perception of risk; social responses to natural and technical disasters; scientific uncertainties and technical disasters; social produced age, gender, racial/ethnic and social class vulnerabilities to disaster; terrorism-caused disasters; and disaster preparedness and prevention.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

SOC 355 [WI] Classical Social Theory 4.0 Credits
Critically examines the ideas of the classical sociological theorists (e.g., Marx, DuBois, Durkheim, and Weber). This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 356 [WI] Contemporary Social Theory 4.0 Credits
Covers a broad range of theories that guide contemporary sociological thought. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: SOC 355 [Min Grade: D] or SOC 260 [Min Grade: D]

SOC 370 Practicum in Applied and Community Sociology 4.0 Credits
This course is central to the newly adopted emphasis of the sociology major on participatory research. These courses are intended as the practicum and supervised project-oriented research work for community organizations and agencies.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

SOC 405 Medicine, Technology and Science 3.0 Credits
This seminar focuses on the social dimensions of medicine, health and illness. In this seminar, we will explore how definitions and experiences of health and illness are shaped by technology use, cultural contexts, institutional practices, health care policies, and inequalities. We will examine social trends in medical technology and science as well as how illness categories are created, negotiated, and resisted. Participants in this course will gain the ability to assess the changing role of science and technology in medicine as well as think critically about the sociological dimensions of the experience of health and illness.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 406 Housing and Homelessness 4.0 Credits
This course examines how housing shapes individual, family, and neighborhood dynamics. Students will be introduced to housing policy in the United States, and will gain an in-depth understanding of homelessness and unstable housing. Other course topics include the meaning of home; the significance of homeownership in the United States; residential segregation; gated neighborhoods; and housing in transnational contexts. Students will learn how to think critically about the role of housing in enduring forms of race, class, and gender-based inequalities and to assess current policy for improving access to stable housing in Philadelphia.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SOC 410 Imagining Multiple Democracies 4.0 Credits
This course will explore the multitude of democratic theories and democracies in practice that have developed during the last several decades. There have been profound changes to our conceptions of 'democracy' during the past 40 years driven by social movements around the globe seeking to change their societies. What kind of society do we imagine when we talk about 'democracy'? We will examine fundamental questions and dilemmas surrounding contemporary democratic culture and we will explore in depth several contemporary democratic movements including feminist, identity based, religiously based, radical, environmentalist, anti-globalization and media activism movements.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

SOC 420 Love, Rage & Debt: The Debt Society 4.0 Credits
This course will explore the sociological implications of debt, on a personal, local, national and international level. Using our own debt as an ethnographic point of departure, we will collectively analyze personal debt, and through this analysis, link our debt to national debt, to historic debt, to reparations, to dispossession, to austerity, both historic and current, to the International Monetary Fund, the World Bank, and to alternative strategies to ameliorate debt, such as Jubilee or debt strikes. We will consider our emotional relationships and political commitments to debt, on both a personal level as well as the societal level. Consideration will focus on how gender, race, nationality, and class intersect with debt, and we will use feminist and critical race theories lenses to frame our discussions.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: SOC 356 [Min Grade: C]

SOC 430 Politics of Life 4.0 Credits
This course will explore the sociological implications of advancements that have been made in genetic engineering, biotechnologies and other areas of biomedical research. Starting with earlier examples of "power over life" from the 18th and 19th centuries, it will explore themes, dilemmas and complications embedded in the scientific control over life. Topics to be explored include biopower and biocapital, eugenics, race and class, stewardship and bioengineering, new reproductive technologies and reproductive choice, among much, much more. Consideration to feminist, queer and critical race theories will frame much of class discussion.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

SOC 444 Social Movements 4.0 Credits
Focuses on movements for social change through the lens of sociological theory and research. Topics include the rise of social movements; the dynamics of mobilization, organization, commitment and collective identity; movement opponents and targets; violent and terrorist social movements; the role of governments and political elites it repressing or facilitating movement activity; and how movements change society.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

SOC 450 Capstone in Sociology 4.0 Credits
This seminar is intended for students majoring or minoring in sociology. Students will reflect on their experiences as a sociology student, connect these with issues in the discipline, and consider how they plan to use their sociological skills and imagination after college.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore
Prerequisites: SOC 101 [Min Grade: C] and (SOC 115 [Min Grade: C] or SOC 210 [Min Grade: C] or SOC 215 [Min Grade: C] or SOC 220 [Min Grade: C] or SOC 221 [Min Grade: C] or SOC 222 [Min Grade: C] or SOC 230 [Min Grade: C] or SOC 235 [Min Grade: C] or SOC 240 [Min Grade: C] or SOC 241 [Min Grade: C] or SOC 242 [Min Grade: C] or SOC 268 [Min Grade: C] or SOC 271 [Min Grade: C] or SOC 276 [Min Grade: C] or SOC 313 [Min Grade: C] or SOC 315 [Min Grade: C] or SOC 320 [Min Grade: C] or SOC 330 [Min Grade: C] or SOC 335 [Min Grade: C] or SOC 340 [Min Grade: C] or SOC 341 [Min Grade: C] or SOC 345 [Min Grade: C] or SOC 346 [Min Grade: C] or SOC 349 [Min Grade: C] or SOC 355 [Min Grade: C] or SOC 356 [Min Grade: C] or SOC 370 [Min Grade: C] or SOC 410 [Min Grade: C] or SOC 420 [Min Grade: C] or SOC 430 [Min Grade: C] or SOC 444 [Min Grade: C])

SOC 490 Sociology Research Seminar I: Research Design 4.0 Credits
An in-depth exploration of selected topics. Projects are selected by students in consultation with a faculty member.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Junior or Senior.
Prerequisites: SOC 241 [Min Grade: D] and SOC 242 [Min Grade: D]

SOC 491 Sociology Research Seminar II: Data Acquisition and Analysis 4.0 Credits
Continuation of SOC 490.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.
Prerequisites: SOC 490 [Min Grade: D]

SOC 492 Sociology Research Seminar III: Practicum in Sociological Research 4.0 Credits
Continuation of SOC 491.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: SOC 491 [Min Grade: D]

SOC I199 Independent Study in SOC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

SOC I299 Independent Study in SOC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

SOC I399 Independent Study in SOC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

SOC I499 Independent Study in SOC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

SOC T180 Special Topics in Sociology 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

SOC T280 Special Topics in Sociology 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

SOC T380 Special Topics in SOC 0.0-12.0 Credits
This course will explore current issues and debates in Sociology. It will be
conducted as a seminar. The topic will vary each term.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

SOC T480 Special Topics in Sociology 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Software Engineering

Courses

**SE 181 Introduction to Software Engineering and Development 3.0
Credits**
Introduces advanced software development fundamentals including
memory management, typing and scoping, datastores, software testing,
and security, as well as user-centric design and user experience.
This course will be taught using a specified programming language of
instruction.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 172 [Min Grade: C]

SE 210 Software Specification and Design I 3.0 Credits
Study of the principles, practices, and techniques used to gather system
requirements and document them in a requirements specification.
Includes techniques for requirements discovery such as user interviews
and prototyping. Introduces approaches for organizing and expressing
software requirements in a requirements specification.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: SE 103 [Min Grade: C] or CS 133 [Min Grade: C] or CS
172 [Min Grade: C] or CS 176 [Min Grade: C]

SE 211 Software Specification and Design II 3.0 Credits
Continues study of requirements with increasing emphasis on converting
requirements into a software system design. Presents alternate
approaches, techniques for evaluating specifications, specification and
design tools, and use of specifications to develop system-level tests.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: SE 210 [Min Grade: C]

SE 310 Software Architecture I 3.0 Credits
Study of macro-level software system architectures with an emphasis on
approaches to interconnection and distribution of current and emerging
architectural styles.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 265 [Min Grade: D] and CS 260 [Min Grade: D]

SE 311 Software Architecture II 3.0 Credits
Continues discussion of software architecture with a focus on micro-
level architecture including patterns, frameworks, and component-based
software engineering, and commercial off-the-shelf software.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: SE 310 [Min Grade: D] or CS 350 [Min Grade: D]

SE 320 Software Verification and Validation 3.0 Credits
Presents theory and practice of software testing. Covers structural testing
including such topics as path testing, dataflow testing, logic based testing,
syntax testing, program slicing, mutation testing, fault injection, program
perturbation, and testing tools. Discusses techniques for test construction
and test suite evaluation, and validation against requirements and design
models. Also covers methods of inspection and review at various phases
of the software lifecycle.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 260 [Min Grade: D]

SE 410 Software Evolution 3.0 Credits
Covers issues related to change in software systems. Addresses
principles and techniques of corrective software maintenance, software
enhancements, and software product family. Introduces students to
issues of change in large software systems including configuration control,
change and product management.
College/Department: College of Computing and Informatics
Repeat Status: Not repeatable for credit
Prerequisites: CS 260 [Min Grade: D]

SE I199 Independent Study in SE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

SE I299 Independent Study in SE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

SE I399 Independent Study in SE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

SE I499 Independent Study in SE 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

SE T280 Special Topics in Software Engineering 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

SE T480 Special Topics in Software Engineering 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Computing and Informatics
Repeat Status: Can be repeated multiple times for credit

Spanish

Courses

SPAN 101 Spanish I 4.0 Credits
Introductory Spanish. Includes listening, speaking, reading, and writing. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SPAN 102 Spanish II 4.0 Credits
Continues SPAN 101. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: SPAN 101 [Min Grade: C]

SPAN 103 Spanish III 4.0 Credits
Continues SPAN 102. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: SPAN 102 [Min Grade: C]

SPAN 201 Spanish IV 4.0 Credits
Intermediate Spanish. Includes grammar review, listening, speaking, and reading. Recommended for students who wish to attain oral competence. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: SPAN 103 [Min Grade: C]

SPAN 202 Spanish V 4.0 Credits
Continues SPAN 201. Offered all terms.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: SPAN 201 [Min Grade: C]

SPAN 310 Advanced Writing and Speaking 4.0 Credits
This course provides advanced practice in written and oral communication including journalistic, professional, and creative writing. Examines contemporary cultural contexts through media and news. This course has a community-based component that will require students to work with members of our community including, but not restricted to Spanish-speaking communities in the area. Taught in Spanish.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: SPAN 202 [Min Grade: C]

SPAN 320 Introduction to Language for the Professions 3.0 Credits
This course covers Introduction to Spanish communication skills in areas such as contemporary business, health, and law in a culturally sensitive fashion. The content of this course may change every term it is offered and is repeatable for credit. Taught in Spanish.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: SPAN 310 [Min Grade: C]

SPAN 330 Introduction to Identities and Communities 3.0 Credits
This course provides an introduction to the analysis of individual and collective identities, including issues of gender, sexual orientation, race, ethnicity, class, nationality, and religion. The content of this course may change every term it is offered and is repeatable for credit. Taught in Spanish.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: SPAN 310 [Min Grade: C]

SPAN 340 Introduction to Power and Resistance 3.0 Credits
This course provides an introduction to the analysis of power relations and issues of (in)equality rooted in contemporary political and socio-economic systems. The content of this course may change every term it is offered and is repeatable for credit. Taught in Spanish.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: SPAN 310 [Min Grade: C]

SPAN 350 Introduction to Language, Media, and Society 3.0 Credits
This course provides an introduction to the role of language and media in society, including sociolinguistics, gender, media studies, and communication. The content of this course may change every term it is offered and is repeatable for credit. Taught in Spanish.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: SPAN 310 [Min Grade: C]

SPAN 410 Advanced Grammar and Translation 3.0 Credits
This course provides advanced grammar instruction and fosters translation and communication skills within a contemporary cultural context. The content of this course may change every term it is offered and is repeatable for credit. Taught in Spanish.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: SPAN 310 [Min Grade: C] and (SPAN 320 [Min Grade: C] or SPAN 330 [Min Grade: C] or SPAN 340 [Min Grade: C] or SPAN 350 [Min Grade: C])

SPAN 420 Advanced Studies in Language for the Professions 3.0 Credits
Spanish 420 provides advanced communication skills in areas such as contemporary business, health, and law in a culturally sensitive fashion. The content of SPAN 420 may change every term it is offered and is repeatable for credit. Taught in Spanish.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: SPAN 310 [Min Grade: C] and (SPAN 320 [Min Grade: C] or SPAN 330 [Min Grade: C] or SPAN 340 [Min Grade: C] or SPAN 350 [Min Grade: C])

SPAN 430 Advanced Studies in Identities and Communities 3.0 Credits
This course provides an advanced analysis of individual and collective identities, including issues of gender, sexual orientation, race, ethnicity, class, nationality, and religion. The content of this course may change every term it is offered and is repeatable for credit. Taught in Spanish.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: SPAN 310 [Min Grade: C] and (SPAN 320 [Min Grade: C] or SPAN 330 [Min Grade: C] or SPAN 340 [Min Grade: C] or SPAN 350 [Min Grade: C])

SPAN 440 Advanced Studies in Power and Resistance 3.0 Credits
This courses provides an advanced analysis of power relations and issues of (in)equality rooted in contemporary political and socio-economic systems. The content of this course may change every term it is offered and is repeatable for credit. Taught in Spanish.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: SPAN 310 [Min Grade: C] and (SPAN 320 [Min Grade: C] or SPAN 330 [Min Grade: C] or SPAN 340 [Min Grade: C] or SPAN 350 [Min Grade: C])

SPAN 450 Advanced Studies in Language, Media, and Society 3.0 Credits
This course provides an advanced analysis of the role of language and media in society, including sociolinguistics, gender, media studies, and communication. The content of this course may change every term it is offered and is repeatable for credit. Taught in Spanish.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 8 times for 27 credits
Prerequisites: SPAN 310 [Min Grade: C] and (SPAN 320 [Min Grade: C] or SPAN 330 [Min Grade: C] or SPAN 340 [Min Grade: C] or SPAN 350 [Min Grade: C])

SPAN 480 Spanish Minor Thesis Course 0.5-4.0 Credits
Independent research study on a topic selected by the student. Independent study is supervised by a faculty member and guided by a plan of study. At the end of the course, the student is required to produce a paper and oral defense on the topic of his paper.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

SPAN I199 Independent Study in SPAN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

SPAN I299 Independent Study in SPAN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

SPAN I399 Independent Study in SPAN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

SPAN I499 Independent Study in SPAN 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

SPAN T180 Special Topics in Spanish 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

SPAN T280 Special Topics in Spanish 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

SPAN T380 Special Topics in Spanish 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

SPAN T480 Special Topics in Spanish 0.5-12.0 Credits
Recommended for Spanish minors and for students with proficiency status. Offered all terms. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Special Education

Courses

EDEX 142 Special Education Foundations: Referral and Assessment 3.0 Credits
This course is an introduction to special education with specific emphasis placed on the history of special education, legal and ethical means of assessment, translating data into the Multi-Disciplinary Evaluation (MDE) and Individualized Education Program (IEP) processes and critical legal issues related to special education.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDEX 344 Inclusionary Practices for Exceptional Students 3.0 Credits
This course will introduce how to manage instruction for students with diverse learning and behavioral profiles in the inclusive classroom. It will address curricular, instructional, environmental adaptations/modifications and the use of technology to address students' needs. Other topics explored include collaboration, co-teaching and practical/philosophical approaches to inclusion. Field observation hours are required.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDEX 142 [Min Grade: B]

EDEX 345 Teaching STEAM in an Inclusive Pre-K to 8 Environment 3.0 Credits
The focus of this course is the teaching of science, technology, engineering, art and mathematics to all students in an inclusive environment. STEAM is an educational approach that uses content for guiding students in inquiry, dialogue and critical thinking. This course will teach instructional interventions and strategies for improving student understanding of complex concepts and fostering experiential and creative learning opportunities. Field experience hours are required for this course.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDEX 142 [Min Grade: B] and EDEX 344 [Min Grade: B]

EDEX 346 Literacy and Content Skill Development PreK-8 3.0 Credits
This course offers a developmental approach for early identification of at-risk individuals and proceeds through literacy stages. Also, research, theory and practical research-supported instructional strategies will be provided for working with students. Literacy skills related to content areas will also be explored. Field observation hours are required.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDEX 142 [Min Grade: B] and EDEX 344 [Min Grade: B]

EDEX 347 Special Education Processes PreK-8 3.0 Credits
This course focuses on special education processes available for students with disabilities in pre-kindergarten through grade 8. Specifically, this course provides an overview of child find, evaluation and education and IEP/IFSP development, implementation and monitoring concepts, as mandated by IDEA and Section 504 of the Rehabilitation Act of 1973. Students will apply special education process strategies such as collaboration, problem solving, progress monitoring and early dispute resolution techniques. Specific legal cases will be reviewed throughout the term.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDEX 142 [Min Grade: B] and EDEX 344 [Min Grade: B]

EDEX 348 Emotional and Behavioral Support of Individuals with Disabilities 3.0 Credits
This course focuses on both low and high-incidence emotional and behavioral problems encountered in general and special education environments. Specific emphasis will be on an understanding of characteristics and interventions that support these types of students. Field experience hours are required for this course.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDEX 142 [Min Grade: B] and EDEX 344 [Min Grade: B]

EDEX 349 High Incident Disabilities 3.0 Credits
This course focuses on high-incidence disabilities, specifically learning disabilities and language disorders encountered in general and special education environments. Additional emphasis is placed on an understanding of characteristics and interventions that support these types of students. Field observation hours are required.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDEX 142 [Min Grade: B] and EDEX 344 [Min Grade: B]

EDEX 350 Teaching Individuals with Low Incident Disabilities 3.0 Credits
The focus of this course is on curriculum development approaches, instructional strategies, and accommodations for students with low incident and moderate/severe disabilities such as: low vision and blindness, hearing impairments and deafness, deaf-blindness, severe health and physical disabilities, and traumatic brain injuries. Field experience hours are required for this course.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDEX 142 [Min Grade: B] and EDEX 344 [Min Grade: B]

EDEX 351 Pervasive Developmental Disorders 3.0 Credits
The focus of this course will be pervasive developmental disorders (PDD), specifically understanding characteristics, instructional strategies and effective interventions. The course will also emphasize behavior reduction strategies that are consistent with a positive behavioral support approach for students with PDD. Field observation hours are required.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDEX 142 [Min Grade: B] and EDEX 344 [Min Grade: B]

EDEX 352 Integrating Technology for Learning & Achievement 3.0 Credits
This course is designed to teach educators how to integrate technology into instruction in general education and special education classes, specifically to support reading, writing and mathematics achievement. It also focuses on the use of technology for universal design for learning and using assistive technology with students with disabilities. Field observation hours are required.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDEX 142 [Min Grade: B] and EDEX 344 [Min Grade: B]

EDEX 353 Special Education: Methods & Practices PreK-8 3.0 Credits
This course will focus on effective instructional strategies to meet the learning needs of students with disabilities. Specific emphasis will be placed upon lesson planning, unit planning, grouping strategies and collaboration with other teachers and staff in all delivery settings. Field experience hours are required for this course.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDEX 142 [Min Grade: B] and EDEX 344 [Min Grade: B]

EDEX 363 Special Education Methods & Practices 7-12 3.0 Credits
The focus of this course is on instructional strategies to meet the unique learning needs of secondary students with disabilities. Lesson planning, unit planning and grouping strategies are key elements in this course. Collaboration with other teaching and non-teaching staff members in all delivery settings is emphasized. Students choose, evaluate, construct and implement instructional materials. Emphasis will be placed on student transition post high school. Field experience hours are required for this course.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDEX 142 [Min Grade: B] and EDEX 344 [Min Grade: B]

EDEX 365 Teaching Secondary Mathematics in an Inclusive Environment 3.0 Credits
The focus of this course is the teaching of mathematics to all students in an inclusive environment. Mathematics and problem-solving are critical life skills and students with disabilities often struggle to master these key skills. This course will teach instructional interventions and co-teaching strategies for improving student understanding of mathematics and fostering problem-solving learning. Field experience hours are required for this course.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDEX 142 [Min Grade: B] and EDEX 344 [Min Grade: B]

EDEX 366 Literacy and Content Skill Development 7-12 3.0 Credits
The focus of this course is literacy skill development of adolescents at-risk for reading disabilities and adolescents currently identified with reading disabilities. The course will teach a variety of instructional interventions and strategies for improving student comprehension in the content areas. The course will also focus on improving vocabulary, fluency, and motivation in adolescents who struggle with reading. Writing strategies and common core standards will be addressed. The course ends with progress monitoring tools in order to determine the success of the interventions and strategies. Field experience hours are required for this course.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDEX 142 [Min Grade: B] and EDEX 344 [Min Grade: B]

EDEX 367 Special Education Processes 7-12 3.0 Credits
This course focuses on the special education processes available for students with disabilities in grades 7 through 12. Specifically, the course provides an overview of the child find system, evaluation, education and transition processes in the development of an Individualized Education Program (IEP), and implementation and monitoring concepts as mandated by IDEA and Section 504 of the Rehabilitation Act of 1973. Students will apply special education process strategies such as collaboration, problem solving, progress monitoring and early dispute resolution techniques. Specific legal cases will be reviewed.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDEX 142 [Min Grade: B] and EDEX 344 [Min Grade: B]

EDEX 414 [WI] Special Education Field Placement Seminar 9.0 Credits
This course is designed to develop special education teaching knowledge, skills and abilities through field placement, supervision and reflective practice. Activities include journaling, best practice workshops and reflecting on relevant case studies.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDEX 348 [Min Grade: B] and EDEX 349 [Min Grade: B] and EDEX 350 [Min Grade: B] and EDEX 351 [Min Grade: B] and EDEX 352 [Min Grade: B] and EDEX 142 [Min Grade: B] and EDEX 244 [Min Grade: B] and (EDEX 353 [Min Grade: B] or EDEX 363 [Min Grade: B]) and (EDEX 347 [Min Grade: B] or EDEX 367 [Min Grade: B]) and (EDEX 246 [Min Grade: B] or EDEX 266 [Min Grade: B])

EDEX I199 Independent Study in EDEX 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDEX I299 Independent Study in EDEX 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDEX I399 Independent Study in EDEX 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDEX I499 Independent Study in EDEX 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDEX T180 Special topics in EDEX 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDEX T280 Special topics in EDEX 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDEX T380 Special topics in EDEX 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDEX T480 Special topics in EDEX 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

Sport Coaching Leadership

Courses

SCL 101 Principles of Coaching 3.0 Credits
This course will include setting performance goals in coaching, the various roles of the coach, ethical conduct in coaching, the psychology of coaching, coach-athlete compatibility, coaching burnout, personality of the coach, and coaching youth sports. An emphasis is places on conducting practices and competitions to enhance the social-emotional growth of athletes.
College/Department: School of Education
Repeat Status: Not repeatable for credit

SCL 102 Principles of Coaching II 3.0 Credits
This course will examine the administrative side of coaching by approaching the profession from a business manager's standpoint. Students will be introduced to the business concepts and techniques applicable to coaching athletics.
College/Department: School of Education
Repeat Status: Not repeatable for credit

SCL 201 Sport-Based Youth Development 3.0 Credits
This course is designed to provide students with an understanding of the field of sport-based youth development (SBYD). Students will learn about sport-based youth development best practices, establishing program goals, key components to successful programs, strategies for financially supporting SBYD programs, and established guidelines for program assessment and growth.
College/Department: School of Education
Repeat Status: Not repeatable for credit

SCL 203 Sports Conditioning 3.0 Credits
This course will take a multi-faceted approach to the general science of strength training and sports conditioning. Students will gain a basic understanding behind training principles by covering the following topics: exercise physiology concepts and applications, testing and evaluation, flexibility and exercise techniques, program design, periodization, aerobic and anaerobic training considerations. This course will provide a practical challenge to the students to apply scientific concepts and principles to the development of a sport specific program in a sport of their choice. Developing and administering a training plan is a key component to coaching and students will become adept at this skill after completing this course.
College/Department: School of Education
Repeat Status: Not repeatable for credit

SCL 210 Prevention and Care of Athletic Injuries 3.0 Credits
This course is designed to introduce the student to the care and prevention of athletic injuries. The course content will include a review of pertinent anatomical structures and their relationship to injuries. The course will also cover mechanisms of injuries, intrinsic and extrinsic variables of injuries, and basic preventative and treatment measures for common sports related injuries. In addition, students will complete the requirements of American Sport Education Program (ASEP) curriculum for Sport First Aid certification and complete the on-line Sport First Aid Test.
College/Department: School of Education
Repeat Status: Not repeatable for credit

SCL 280 Kinesiology 3.0 Credits
This course provides an introduction and overview to the science of human movement. Identifies uses of the field of kinesiology in relation to science, medicine, human behavior, athletics, and overall fitness. Applies knowledge and concepts to the areas of physical activity, athletics, and recreation/fitness. Students will actively participate in and observe human movement in human performance labs.
College/Department: School of Education
Repeat Status: Not repeatable for credit

SCL 314 Sport Performance and Energy Systems 3.0 Credits
This course covers nutrient categories and how they function in the body, with a particular emphasis on how to instill in athletes the advantages of healthy eating, and how to impart good information regarding food and food choices to a group of athletes in a team environment.
College/Department: School of Education
Repeat Status: Not repeatable for credit

SCL 315 Athletic Recruiting 3.0 Credits
This course is designed to provide students with the necessary tools to become effective recruiters of athletic talent. Students will learn how to identify and recruit talent that will have a high impact within their athletic programs. Students will understand how to be compliant with NCAA, NAIA, and NJCAA rules when recruiting. A major deliverable of this course will be a comprehensive recruiting plan.
College/Department: School of Education
Repeat Status: Not repeatable for credit

SCL 325 Athlete Leadership Development 3.0 Credits
This course is designed to provide students with an understanding of athlete leadership development and its importance in sport programming. Various athlete leadership models at the youth, scholastic, collegiate, and professional levels will be reviewed and students will have the opportunity to create their own athlete leadership development program.
College/Department: School of Education
Repeat Status: Not repeatable for credit

SCL 345 Evaluating Athletes and Teams 3.0 Credits
This course is designed to provide students with the necessary tools to become effective evaluators of athletes, teams, and coaches. Students will learn how to create a comprehensive evaluation strategy and to communicate and share this strategy with key constituents to effectively manage overall improvement. A major deliverable of this course will be a comprehensive evaluation plan.
College/Department: School of Education
Repeat Status: Not repeatable for credit

SCL 401 Professional Coaching Portfolio 3.0 Credits
The professional portfolio is a capstone course that provides Sport Coaching Leadership majors with an opportunity to demonstrate achievement in their major and to engage in self-reflection. Components include reflective essays and carefully chosen samples of academic and relevant professional work completed during the college experience.
College/Department: School of Education
Repeat Status: Not repeatable for credit

SCL 419 Global Coaching Seminar 3.0 Credits
This course is designed to expose coaches to a variety of international coaching methods and concepts via a study abroad experience for 7-10 days. This seminar is offered each summer and locations vary by year. Each student in the Sport Coaching Leadership program will attend this study abroad experience. An emphasis is placed on athlete interaction and engagement, practice planning, recruiting, and sport for development.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: SCL 101 [Min Grade: C] and SCL 102 [Min Grade: C]

SCL 495 Coaching Practicum I 3.0 Credits
The practicum is designed to develop greater breadth and depth of students' understanding and experience within the coaching industry. This course provides an opportunity for students to apply the knowledge and skills acquired in the Sport Coaching Leadership program in a practical setting. This is the first practicum in a series of three coaching practicums. This practicum experience will focus on using basic coaching theory and principles under the guidance of the current coaching or administrative staff.
College/Department: School of Education
Repeat Status: Not repeatable for credit

SCL 496 Coaching Practicum II 3.0 Credits
The practicum is designed to develop greater breadth and depth of students' understanding and experience within the coaching industry. This course provides an opportunity for students to apply the knowledge and skills acquired in the Sport Coaching Leadership program in a practical setting. This is the second practicum in a series of three coaching practicums. This practicum experience will focus on gaining experience in the administrative aspects of coaching under the guidance of the current coaching or administrative staff.
College/Department: School of Education
Repeat Status: Not repeatable for credit

SCL 497 Coaching Practicum III & Project 6.0 Credits
The practicum is designed to develop greater breadth and depth of students' understanding and experience within the coaching industry. This course provides an opportunity for students to apply the knowledge and skills acquired in the Sport Coaching Leadership program in a practical setting. This is the final practicum in a series of three coaching practicums. This practicum experience will focus on designing and completing a coaching project for a particular team under the guidance of the current coaching or administrative staff.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: SCL 495 [Min Grade: CR] and SCL 496 [Min Grade: CR]

SCL I199 Independent Study in SCL 0.0-12.0 Credits
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

SCL I299 Independent Study in SCL 0.0-12.0 Credits
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

SCL I399 Independent Study in SCL 0.0-12.0 Credits
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

SCL I499 Independent Study in SCL 0.0-12.0 Credits
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

SCL T180 Special Topics in SCL 0.0-12.0 Credits
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

SCL T280 Special Topics in SCL 0.0-12.0 Credits
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

SCL T380 Special Topics in SCL 0.0-12.0 Credits
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

SCL T480 Special Topics in SCL 0.0-12.0 Credits
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

Sport Management

Courses

SMT 110 The Business of Sport 4.0 Credits
This course will introduce students to the billion-dollar international sports industry and identify the vast, creative, and substantial role business plays in professional, collegiate and amateur sports. Sports business applications are explored in the following areas: sponsorship, promotions, marketing, fundraising, finance, media, ticketing, public relations, law, facilities, and sport careers.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

SMT 200 Introduction to Sport Facility and Event Management 3.0 Credits
Introduction to Sport Facility and Event Management. An introduction to the planning, running, maintaining and evaluating of sporting facilities and events. This course will introduce students to topics pertinent to the operation of sports facilities and to the management and organization of sports events. Financial considerations for both the private and public sector will be emphasized.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: SMT 110 [Min Grade: D]

SMT 201 Sports Marketing, Promotion, and Public Relations 4.0 Credits
Students will build an integrated marketing plan for a sporting event by first describing how the four Ps of marketing are applied in sports. Students learn about the uses of the essential elements of marketing. Students will be able to identify the conventions of sport promotions and public relations.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: SMT 110 [Min Grade: D] and MKTG 201 [Min Grade: D]

SMT 205 Sport Media Relations 4.0 Credits
This course is an overview of media relations and its role in the field of sport management. This course will cover skill sets and roles a media relations specialist must demonstrate in order to be successful. There will be emphasis on writing, communication, planning, and organizational skills.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: SMT 110 [Min Grade: D]

SMT 215 Sports Ticket Sales & Operations 3.0 Credits
Course will examine the diverse and changing environment of ticket and operation sales in the sport industry. Course will expose students to the standards, principles and practices that can be applied to multitude of areas that ticketing touches within the sports industry.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is SMT.
Cannot enroll if classification is Freshman
Prerequisites: SMT 110 [Min Grade: D]

SMT 220 Recreation, Wellness & Society 3.0 Credits
This course chronicles the history and trends in recreation in modern society. It identifies the major operations of the recreation industry and demonstrates its economic impact; compares and contrasts the purposes and practices of recreation, leisure, and sport. Emphasis will be placed on asking to what degree increased recreation impacts the health and wellness of a society.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

SMT 225 Sports Budgeting 3.0 Credits
Basic theory in finance and accounting applied to managerial control of sport organizations. Includes forms of ownership, taxation, financial analysis, capital budgeting, and economic impact studies.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is SMT.
Cannot enroll if classification is Freshman
Prerequisites: ACCT 110 [Min Grade: D]

SMT 227 Sport Entrepreneurship 4.0 Credits
This course will introduce students to the field of sport entrepreneurship by coupling entrepreneurship as a generic activity with the many opportunities the sports industry presents. It explores the challenges faced by individuals starting up new ventures and the probable paths of career development for students pursuing entrepreneurship.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

SMT 230 Sports and the Law 4.0 Credits
Reviews the legal and regularity aspects, elements, and relationships for all constituents participating in sports: administrators, coaches, athletes, agents, vendors, sponsors, faculty managers and owners, and spectators. Seminal court cases are discussed. Students examine the inextricable links between the law and business ethics.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

SMT 235 Sports Administration and Governance 3.0 Credits
Sports create governance structures, policies, and procedures, even at the most rudimentary level. This course examines the purpose and practice of sports governance and how it relates to sports administration from little league, to the Olympic Games, to international federations, to professional sports.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: SMT 110 [Min Grade: D]

SMT 240 Olympic Games 4.0 Credits
Provides an overview of modern Olympic Games focusing on the organization, politics, economic implications and the bidding process of the Games. Topics of sponsorship, media coverage and ethical considerations will be discussed. The course will also address how the spirit of the Olympic Games has changed over time.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

SMT 245 NCAA Compliance 4.0 Credits
This course will overview basic regulatory, legal and due process rules that govern NCAA competition. Course will cover elements of NCAA regulations, rules interpretations, enforcement decisions and sanctions. An understanding of NCAA rules compliance will be gained through legal cases and actual NCAA enforcement proceedings.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

SMT 250 [WI] Technology and Sport 3.0 Credits
Students will identify the major areas where technology has enhanced the performance of athletes and the participation in sports spectatorship. They will be introduced to the essential technologies used in sport management with an emphasis on communication technology.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: SMT 110 [Min Grade: D]

SMT 254 Women & Minority Opportunities in Sport 3.0 Credits
This course chronicles the major events and strategies used for women and minorities to have equal opportunities to participate in sports at all levels. It pOints out the social and legal issues surrounding the dramatic rise in women and minority participation at all levels of play.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

SMT 255 Legal Foundations of Title IX 4.0 Credits
This course will overview the basic legal concepts surrounding Title IX and its applications to intercollegiate athletics programs. The basic elements of Title IX and how various tests are applied by the court system will be included. Course will focus on actual legal cases, investigations and remedial plans.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: SMT 230 [Min Grade: D]

SMT 260 Sports Agents & Labor Relations 4.0 Credits
This course examines the controversial nature of being a sports agent. Students will be exposed to legal and ethical issues that surround sports agents. Additionally, students will review the labor relations laws and collective bargaining agreements that govern professional sports through a variety of lectures, readings and assignments.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: SMT 230 [Min Grade: C-] or BLAW 201 [Min Grade: C-]

SMT 262 Digital Sports Storytelling 4.0 Credits
This course is designed to introduce students to digital storytelling in sports. Topics will include locating and defining a sports story, framing a sports story for audience and platform, and storyboarding. Students will learn the power behind stories and how to use them to enhance and develop fan engagement, drive attendance and increase sponsorship. Students will write, produce and edit digital stories on mobile platforms.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: SMT 110 [Min Grade: D]

SMT 270 Sports Facility Planning & Management 4.0 Credits
This course is designed to provide learning experiences in managing sport facility operations, planning new sport facilities, and renovating and maintaining new facilities. An understanding of sports facilities, their design, and management will be gained through field study, speakers, and standard classroom material.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

SMT 275 Sports Event Management 4.0 Credits
This course provides the student with exposure to comprehensive event planning, funding and managing sports events including those for professional, amateur and collegiate sports events, and commercial, recreational, and club sports.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

SMT 285 Sport, Industry, and Society 4.0 Credits
The focus of this course is on the social forces that shape the sport industry in the United States and internationally and the influence the sport industry has on society. Students are encouraged to critically examine common understandings of sport from economic, historical, political, and sociological perspectives.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: SMT 110 [Min Grade: D]

SMT 290 Digital Media in Sport 4.0 Credits
This course is designed to introduce students to the digital landscape of sport business. Topics include current issues in digital sports media, digital media and sports facilities, digital media and professional sports teams, mobile applications in sport, and selling digital sport products and services.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: SMT 110 [Min Grade: D]

SMT 300 Quantitative Analysis and Statistics for Sports 3.0 Credits
This is an intensive course presented for the non-specialist in statistical analysis and statistical models applicable in the sports industry. The emphasis is on proper application of classical descriptive and inferential techniques to design-making using sample data. Covers statistical techniques that can be applied to further studies in the sports.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: SMT 110 [Min Grade: D] and (MATH 101 [Min Grade: D] or MATH 181 [Min Grade: D])

SMT 305 Fundraising in Sports 4.0 Credits
Fundraising in Sports will examine the skills, strategies and techniques needed for successful annual and major gift solicitation in the field of athletic development. Areas to be addressed include: understanding annual fund and major gift fundraising, examining booster club: organization structure and benefits, priority seating programs, the importance of donor research in the fundraising process, capital campaigns in sport, and the use of special events to achieve fundraising success.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: SMT 110 [Min Grade: D]

SMT 307 Corporate Sponsorship in Sports 4.0 Credits
Course will examine marketing strategy and techniques used by industry professionals to increase revenues for sports properties. Students will gain an understanding of sponsorship sales terminology, cold calling and prospecting techniques, marketing proposal presentation guidelines and relationship building strategies to increase overall sales.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

SMT 309 Capital Campaigns in Athletics 3.0 Credits
Course will examine strategies organizations use to develop and launch successful athletic capital campaigns. Areas addressed include understanding a capital campaign and setting fundraising goals. Organizational readiness, feasibility study and campaign failures will also be addressed.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is SMT.
Cannot enroll if classification is Freshman
Prerequisites: SMT 110 [Min Grade: D] and SMT 201 [Min Grade: D]

SMT 310 Sports Contracts 4.0 Credits
Course will cover basic legal issues and strategies surrounding contract issues in sports. Students will be introduced to basic elements of contract law and see it applied by the court system in the context of the sports industry.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: SMT 230 [Min Grade: C-] or BLAW 201 [Min Grade: C-]

SMT 315 Sports Publications & Graphics 3.0 Credits
Course will examine sports publications such as tickets, fund raising and marketing brochures, media guides, annual reports and website publications. Students will submit writings to the sport management online digest.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is SMT.
Cannot enroll if classification is Freshman
Prerequisites: SMT 205 [Min Grade: D]

SMT 320 Sport Economics 4.0 Credits
An introduction to the economics of sports. Topics include sports markets: demand, supply and pricing; organization, monopoly power and market failure; labor relations, labor market problems and remedies, public finance of sports, the law and economics of sports, and the economics of college sports.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: ECON 201 [Min Grade: C-]

SMT 321 Money, Power, Politics: College Sports in America 4.0 Credits
Students will examine the dynamics that drive college athletics departments today. Looking through the lens of divisional and conference affiliation, students will begin to understand internal and external forces that drive athletics outcomes.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

SMT 325 Business of Sports Media 4.0 Credits
This course examines the media companies' financial relationships with sports franchises both nationally and internationally. Students will assess the technology shifts over time and learn how those broadcasters who control sports programming have been aided by favorable Federal policies and interpretations, as well as (at times) Congressional intervention. Included in this course is an examination of how the NFL, Major League Baseball, the NBA and College Conference Networks structure their media rights deals. Students will research how to value a media deal.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

SMT 333 Sports Gambling 4.0 Credits
This course will review and examine the history, policies, economics, and regulation of sports gambling in the United States. The emphasis will be on assisting the student in understanding the concepts related to the relatively new area of legalized sports betting in the United States. Class sessions will be devoted to examining and discussing the reading assignments and current issues in the field of sports gambling. Real world examples will be used to illustrate the concepts and principles.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

SMT 335 Sport Governance & Policy 4.0 Credits
Basic theories of organization and leadership applied to sport organizations. Included are professional team-sport leagues, intercollegiate athletics, the Olympic movement, and international sport associations.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: (ORGB 300 [Min Grade: D])

SMT 337 Risk Management in Sports 3.0 Credits
Course will cover basic issues and strategies surrounding risk management in athletics. Students will be introduced to types of legal obligations and liability exposure inherent in sports and the tools used to minimize risk. Emphasis will be on safety review and risk assessment.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is SMT.
Cannot enroll if classification is Freshman
Prerequisites: SMT 230 [Min Grade: D] and BLAW 201 [Min Grade: D]

SMT 340 [WI] International Aspects of Sport 4.0 Credits
International sport should be understood within and outside the culture of a country in which it is being played or viewed. This course will allow students to develop an appreciation of non-American sporting cultures across the world, learn about potentially unfamiliar sports and sporting events and contrast different aspects of the sports industry with those within the US. Globalization and its implications for the sporting world will also be investigated, as will trans-national companies and organizations that impact the sport marketplace.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: SMT 110 [Min Grade: D]

SMT 345 Fan Experience Management 3.0 Credits
Course will explore impact of fan experience on the sports industry. Course will examine customer service philosophies and techniques to improve overall experience of consumers. Course will also review research methods used to measure fan/ sponsor experience and determine impact on retention, entertaining spend and per capita spending.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: SMT 110 [Min Grade: D] and SMT 201 [Min Grade: D]

SMT 347 Sport Tourism 3.0 Credits
Students will investigate international sport tourism organizations and their services, and analyze issues including: Sport tourism facility and event financing; sport tourism impacts; and globalization and sport tourism.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: SMT 110 [Min Grade: D]

SMT 360 Sport Ticket Operations 3.0 Credits
This course will introduce students to the discipline of ticket operations by studying policy development, ticket distribution, customer service, ticketing technology, priority systems, legal issues in ticketing, ticket pricing, and the secondary ticket market.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: SMT 110 [Min Grade: D]

SMT 362 Sport Ticket Sales 4.0 Credits
This course provides training in all aspects of ticket sales including networking, prospecting and qualifying, creating sales proposals, overcoming objections, and closing sales. Specific techniques such as role playing will be used to prepare students for careers in sport ticket sales.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: SMT 110 [Min Grade: D]

SMT 365 Operations Management in Sport 3.0 Credits
This course tracks the growing network of media outlets devoted to sports coverage and shows the essential conventions of sports coverage. Students discover how sports news is gathered, designed, and disseminated to many audiences and observe the dynamics between and among athletes, athletic events, businesses of sports, and the media.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: SMT 110 [Min Grade: D] and SMT 250 [Min Grade: D] and ORGB 300 [Min Grade: D]

SMT 372 Sport Business Consulting 4.0 Credits
Students act as consultants to local, national and global companies working on real sports business issues. Student teams, with the support of advisors and faculty, focus on helping clients achieve new insights to business challenges through data driven decisions. Projects integrate various sport industry sectors. Students will define conceptual and theoretical issues, conduct research, design surveys, and analyze data central to for profit firms and non-profit organizations. Students will present plans and recommendations to help resolve clients' business challenges. Clients and projects vary each term. Client team meetings may occur during business hours.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

SMT 375 Sport Finance 4.0 Credits
Basic theory in finance applied to managerial decision making in sport firms and organizations. Includes forms of ownership, financial analysis, risk analysis and portfolio evaluation, and capital budgeting techniques, all as applied to sports. The finance of sports facilities including taxation and subsidization and methods for evaluating publicly financed projects.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: FIN 301 [Min Grade: C-]

SMT 380 Sports Analytics 4.0 Credits
Theory, development, and application of analytics in sport. The application of analytics in sport for purposes of evaluating player performance, managerial decisions, pricing, and other areas in sport industry operations.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: STAT 201 [Min Grade: C]

SMT 382 Decision Making in Sport Business 3.0 Credits
This course introduces students to the decision-making process they will face in policy making and policy enforcement while working as an administrator in the sports field.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: SMT 110 [Min Grade: D]

SMT 401 Professional Portfolio 3.0 Credits
The professional portfolio is a capstone course that provides sport management majors an opportunity to demonstrate achievement in their major and engage in self-reflection. Components include reflective essays and samples of relevant professional work completed during the college experience.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is SMT and classification is Senior.

SMT 475 Sports Industry Practicum 4.0 Credits
The practicum is designed to develop greater breadth and depth of students' understanding and experience within the industry. The practical application of knowledge and skill acquired in class will help students extend their expertise by working in a sport management related organization. Suggested for non-co-op students.
College/Department: LeBow College of Business
Repeat Status: Can be repeated 2 times for 6 credits

SMT I199 Independent Study in SMT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

SMT I299 Independent Study in SMT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

SMT I399 Independent Study in SMT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if major is SMT.

SMT I499 Independent Study in SMT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

SMT T180 Special topics in SMT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

SMT T280 Special topics in SMT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

SMT T380 Special topics in SMT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

SMT T480 Special topics in SMT 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

Statistics

Courses

STS 345 Statistics for the Health Sciences 4.0 Credits
This course is designed to provide students with a foundation of basic statistical knowledge to aid in reading and understanding research results in the health science literature. Topics will include: variable types, sampling, scales of measurement, reliability and validity of measurement, study designs, descriptive statistics, classical statistical inference, correlation, chi-square, parametric and nonparametric tests for group comparisons.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit

STS 350 Advanced Statistics for the Health Sciences 4.0 Credits
This course is designed to provide students with an understanding of advanced statistical procedures and their applications to research designs in the health science literature. Topics include: one-way, two-way, repeated measure, and mixed factorial analyses of variance (ANOVAs); analysis of covariance (ANCOVA); multivariate analysis of variance (MANOVA); correlation; bivariate, multivariate, and logistic regressions; odds/risk ratios; exploratory factor analysis; and meta-analytic techniques.
College/Department: College of Nursing Health Professions
Repeat Status: Not repeatable for credit
Prerequisites: STS 345 [Min Grade: D]

Systems Engineering

Courses

SYSE 488 Systems Engineering Analysis 3.0 Credits
Introduces multiple System Engineering Analysis practices used to execute systems engineering processes. Provides foundation to execute, monitor, and manage the traditional practices and also develops ability to modify and establish new practices based on this massive foundation. Instills confidence so student can contribute, lead, monitor or manage any systems effort.
College/Department: College of Engineering
Repeat Status: Not repeatable for credit

TV Industry & Enterprise

Courses

TVIE 180 TV Industry Overview 3.0 Credits
The TV industry (broadcast, cable, satellite and internet) is explored. Topics examined include station and network relations, production, support systems, sales and promotion, revenue streams (advertiser, subscriber and hybrid), financial and legal systems that control TV, and program formats including TV content distributed by Internet, Wifi and mobile.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

TVIE 250 TV Sports Program Strategies 3.0 Credits
The course will analyze the "big 4" major sports franchises (NFL, MLB, NBA, NHL) by looking at the rights holders, the marketing, the ratings, and the coverage. We will also examine the creation and growth of Regional and National Sports Networks, and study the innovators and their contributions to the business of sports on television. We will examine how sports teams generate revenue with television, how advertising and sponsor-ships are bought and sold, and how television rights are negotiated and awarded.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

TVIE 280 Research, Sales and Programming 3.0 Credits
Research, sales and programming are the core of the TV industry. Students examine the selling environment; the research process; the meaning of "audience"; metrics; the sales process; market analysis; program pomotion; and broadcast, cable, radio, and interactive media sales. Formats, day parts, scheduling, linkages and promotions are also explored.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

TVIE 285 Media Law and Ethics 3.0 Credits
This course studies the intersection of media law and ethics. Included are: current legal issues in old and new media industries, the First Amendment, Congress and the FCC, licensing and regulation of media businesses, intellectual property and rights acquisition, and the foundation for ethical actions that result from multiple cross-pressures.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: TVIE 180 [Min Grade: D] or EAM 130 [Min Grade: D]

TVIE 290 Introduction to Money and the Media 3.0 Credits
This course focuses on the economics of various segments of the media business, with an emphasis on television through its past, present and future incarnations. Instruction will focus on the business models for various media, and case studies of financial decisions faced by media companies.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

TVIE 390 Practicum: Promotions 3.0 Credits
Students learn the art of promotions through industry placements, including DUTV. Students will produce promos for TV shows, create on-air branding elements for stations, design promotion materials, and complete other tasks related to promotions.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 6 times for 18 credits
Prerequisites: FMVD 110 [Min Grade: D] and FMVD 115 [Min Grade: D] and FMVD 120 [Min Grade: D] and TVIE 180 [Min Grade: D] and TVIE 280 [Min Grade: D]

TVIE 480 TV Professions and Business 3.0 Credits
An exploration of professions and opportunities for entrepreneurship in the TV industry through readings and guest lectures. After student assess their research, skills, and talents, they will research professional and business opportunities that match their future aspirations.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

TVIE I199 Independent Study in TV Industry & Enterprise 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVIE I299 Independent Study in TV Industry & Enterprise 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVIE I399 Independent Study in TV Industry & Enterprise 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 6 times for 18 credits

TVIE I499 Independent Study in TV Industry & Enterprise 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVIE T180 Special Topics in TV Industry & Enterprise 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVIE T280 Special Topics in TV Industry & Enterprise 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVIE T380 Special Topics in TV Industry & Enterprise 1.0-3.0 Credit
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 6 times for 21 credits

TVIE T480 Special Topics in TV Industry & Enterprise 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TV Information & Technology

Courses

TVIT I199 Independent Study in TV Information & Technology 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVIT I299 Independent Study in TV Information & Technology 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVIT I399 Independent Study in TV Information & Technology 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVIT I499 Independent Study in TV Information & Technology 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVIT T180 Special Topics in TV Information & Technology 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVIT T280 Special Topics in TV Information & Technology 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVIT T380 Special Topics in TV Information & Technology 3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 6 times for 18 credits

TVIT T480 Special Topics in TV Information & Technology 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TV Production

Courses

TVPR 100 TV Studio: Basic Operations 3.0 Credits
This course will focus on developing operational skills for all studio production facilities including camera operations and composition, microphones and audio mixers, basic lighting, teleprompter, video switcher and graphics playback.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

TVPR 200 TV Studio: Live Directing 3.0 Credits
This course is an Introduction to directing live and taped multi-camera television productions in a studio setting. The emphasis will be on developing solid, basic directing technique that will be built upon in subsequent additional directing courses. Students will direct simple programs in almost every class.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: TVPR 100 [Min Grade: D] or FMTV 130 [Min Grade: D]

TVPR 201 TV Studio: Comedy 3.0 Credits
This course gives students instruction and experience in producing, interpreting, staging, directing, shooting, and live-cutting scenes in a studio. Students also experience the challenge of managing a cast and crew while simultaneously dealing with the kind of time, resource, and technical limitations that exist in the professional world.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: TVPR 100 [Min Grade: D] or FMTV 130 [Min Grade: D]

TVPR 202 TV Studio: Drama 3.0 Credits
This course gives students instruction and experience in producing, interpreting, staging, directing, shooting, and live-cutting and producing dramatic scenes in a studio. Students also experience the challenge of managing a cast and crew while simultaneously dealing with the kind of time, resource, and technical limitations that exist in the professional world.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: TVPR 100 [Min Grade: D] or FMTV 130 [Min Grade: D]

TVPR 205 TV Studio: Advanced Live Directing 3.0 Credits
This course is designed to build on skills acquired in TVPR 200 TV Studio: Live Directing. Students will direct increasingly more complex programs, primarily news and information shows. Additional directing opportunities for the production of programming for DUTV will be offered to students taking this course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (TVPR 100 [Min Grade: D] or FMTV 130 [Min Grade: D]) and TVPR 200 [Min Grade: D]

TVPR 210 TV Studio: Narrative 3.0 Credits
This course gives students instruction and experience in producing, interpreting, staging, directing, shooting, and live-cutting scenes in a studio. Students will experience the challenge of managing a cast and crew while simultaneously dealing with the kind of time, resource, and creative challenges that exist in the professional world.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

TVPR 212 TV Commercials and Promos 3.0 Credits
Students will analyze and produce a wide varity of television commercials and promos. Fundamental concepts of brand marketing will be presented and utilized in the production of student's own script-to-screen commercials and promos. This history of commercials, both in the United States and worlwide, will also be studied.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (FMVD 110 [Min Grade: D] and FMVD 115 [Min Grade: D] and FMVD 120 [Min Grade: D]) or (FMTV 110 [Min Grade: D] and FMTV 115 [Min Grade: D] and FMTV 120 [Min Grade: D])

TVPR 220 TV News Writing 3.0 Credits
This is a basic introduction to writing for television news broadcasts. Students will learn to conceptualize, confirm and write stories on deadline, and develop basic interviewing skills. Issue of journalistic ethics will be presented and discussed. Weekly story assignments will be given to augment classroom work.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

TVPR 221 TV News Production 3.0 Credits
This course is an introduction to single camera field production for TV news, exposing students to the basics of writing, shooting, field lighting and remote news production logistics. Students will learn techniques of video and audio acquisition as well as satellite, microwave and STL type operations.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: FMVD 110 [Min Grade: D] or FMTV 110 [Min Grade: D]

TVPR 230 Scripted TV Production 3.0 Credits
This course gives students instruction and experience in scouting, prepping, producing, interpreting, staging, directing, and shooting dramatic scenes on location. Students also experience the challenge of managing a cast and crew while simultaneously dealing with the kind of time, resource and technical limitations that exist in the professional world.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (FMVD 110 [Min Grade: D] or FMTV 110 [Min Grade: D]) and (FMVD 115 [Min Grade: D] or FMTV 115 [Min Grade: D]) and (FMVD 120 [Min Grade: D] or FMTV 120 [Min Grade: D])

TVPR 236 Reality TV Production 3.0 Credits
This course gives students instruction and experience in doing Reality TV shows in the field.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 2 times for 9 credits
Prerequisites: (FMVD 110 [Min Grade: D] and FMVD 115 [Min Grade: D] and FMVD 120 [Min Grade: D]) or (FMTV 110 [Min Grade: D] and FMTV 115 [Min Grade: D] and FMTV 120 [Min Grade: D])

TVPR 240 Producing for Television 3.0 Credits
This course introduces students to the art and craft of producing for television and examines every aspect of the producer's role in the developing, selling, pre-production, production, post-production, delivery, and marketing of a show. Students will also learn the functions of all other jobs involved in a producation.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

TVPR 242 TV On-Camera Performance 3.0 Credits
Students will receive practical experience in all aspects of television performance, including anchoring, reporting, announcing, hosting, and acting. This class is designed specifically for those production students with little or no acting or on-camera experience, but who will benefit from a greater understanding of the performance process.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

TVPR 291 Television Internship 1.0-3.0 Credit
The student does a non-paying internship in the field of television for academic credit, working a minimum of 100 hours in a 10-week term for 3 credits. The student provides an initial informational sheet on the internship and submits a final paper on the experience. May be repeated for credit. The first time the course may be taken for 3 credits. After that, the course may be repeated, but for 1 credit each time. Department permission required.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 12 credits

TVPR 300 TV Series Editing 1.0-6.0 Credit
This course moves beyond the technical aspects of editing to introduce students to the process of communication that is at the heart of the relationship between editors and the directors and producers of a television series.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: TVPR 100 or FMTV 130

TVPR 315 Episodic Webisode Production 3.0 Credits
The students will experiment with many options for developing programming for streaming on the web. They will then create finished episodes that can run on Drexel's website, other on-line outlets or podcasts. The students will also develop viral marketing strategies to promote their work.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: (FMVD 110 [Min Grade: D] and FMVD 115 [Min Grade: D] and FMVD 120 [Min Grade: D]) or (FMTV 110 [Min Grade: D] and FMTV 115 [Min Grade: D] and FMTV 120 [Min Grade: D])

TVPR 340 Remote TV Production 3.0 Credits
Students will learn all of the skills necessary to become effective crewmembers on remote multi-camera shoots produced by the Paul F. Harron Studios and DUTV. Relevant electrical, electronic and video engineering subjects will also be covered. Safety procedures will be taught, stressed and required of all class participants.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: TVPR 100 [Min Grade: D] or FMTV 130 [Min Grade: D]

TVPR 354 TV Series I 0.5-6.0 Credits
Students will start with scripts for multiple episodes written in SCRP 353. They will do all pre-production including casting, location scouting, budgeting, scheduling, and production design. They will then shoot every page of script, getting all the coverage needed to produce finished episodes for DUTV.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (FMVD 110 [Min Grade: D] and FMVD 115 [Min Grade: D] and FMVD 120 [Min Grade: D]) or (FMTV 110 [Min Grade: D] and FMTV 115 [Min Grade: D] and FMTV 120 [Min Grade: D])

TVPR 355 TV Series II 0.5-6.0 Credits
This course is a continuation of "TV Series I" and will focus on post-production of the episodes. The students will log, organize, and prep the raw footage for editing. Teams of students will then work together to edit each episode. Completed episodes will be broadcast on DUTV.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: (FMVD 110 [Min Grade: D] and FMVD 115 [Min Grade: D] and FMVD 120 [Min Grade: D]) or (FMTV 110 [Min Grade: D] and FMTV 115 [Min Grade: D] and FMTV 120 [Min Grade: D])

TVPR 356 DNews 0.5-6.0 Credits
This course takes students through the experience of producing a 30 minute version of "60 Minutes" style magazine program, including studio segments, bumpers, field pieces, and final assembly. Special emphasis will be given to aspects of time management.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 2 times for 18 credits

TVPR 357 DNews II 0.5-6.0 Credits
DNews takes students through the experience of producing a 30 minute style magazine program. Students complete packages for the show and put together field and studio transitional elements. Selected programs may be shown on DUTV.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 2 times for 18 credits

TVPR 495 Senior Project: TV Production I 3.0 Credits
Both production tracks in the Television major, TV Comedy & Drama Production and TV News & Nonfiction Production, take this first course in a 3-course sequence for senior project. Students will take on significant roles, such as producer, writer, director, videographer, or editor in the production of television programs.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is TELE and classification is Senior.
Prerequisites: FMTV 340 [Min Grade: D]

TVPR 496 Senior Project: TV Production II 3.0 Credits
Both production tracks in the Television major, TV Comedy & Drama Production and TV News & Nonfiction Production, take this second course in a 3-course sequence for senior project. Students will take on significant roles, such as producer, writer, director, videographer, or editor in the production of television programs.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is TELE and classification is Senior.

TVPR 497 Senior Project: TV Production III 3.0 Credits
Both production tracks in the Television major, TV Comedy & Drama Production and TV News & Nonfiction Production, take this third course in a 3-course sequence for senior project. Students will take on significant roles, such as producer, writer, director, videographer, or editor in the production of television programs.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is TELE and classification is Senior.

TVPR I199 Independent Study in TV Production 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVPR I299 Independent Study in TV Production 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVPR I399 Independent Study in TV Production 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVPR I499 Independent Study in TV Production 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVPR T180 Special Topics in TV Production 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVPR T280 Special Topics in TV Production 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVPR T380 Special Topics in TV Production 0.5-6.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 6 times for 18 credits

TVPR T480 Special Topics in TV Production 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TV Studies

Courses

TVST 105 TV History 3.0 Credits
This course explores the history of television as art and communication. Topics include: the origins and development of television programming, the regulatory environment and the history of the business of television. Television programs, both fictional and non-fictional, will be viewed from the fifties through the present time.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

TVST 260 History of Television 3.0 Credits
This course explores the history of television as art and communication. Topics include: the origins and development of television programming, the regulartory environment and the history of the business of television. Television programs, both fictional and non-fictional, will be viewed from the fifties through the present time.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

TVST 261 History of TV Journalism 3.0 Credits
This course presents a history of broadcast introduction in the United States. It includes an introduction to the origins, portocals, and principles of journalism on television. It also acquaints students with the prominent trends, programs, and reporting styles throught the decades leading to present-day norms and motivations.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

TVST 361 Art of TV Comedy 3.0 Credits
This course explores the history of television comedy and examines its role as both programming staple and artistic form. By examining how sitcoms reflect our society and its most important social issues, the course seeks to enable students to gauge where both culture and the sitcom are headed.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

TVST 362 Art of TV Drama 3.0 Credits
Students will view and analyze prime-time, hour-long, dramatic TV shows, starting with television's golden age of the fifties and moving to television's "second golden age" starting in the eighties. Students will examine the relationship of the series to other programs, contemporary culture, and television history.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

TVST 363 Science Fiction Television 3.0 Credits
Students will view a progression of science fiction television shows from the fifties to the present time. Students will examine how each show uses an imagined world as a vehicle for exploring facets of our own world. The concepts and the production values will be discussed for each show.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

TVST 364 Teen Television 3.0 Credits
This course looks at acclaimed television programs from the fifties to the present, which present the experience of teenagers as central to the overall show. Students will discuss the content and form of each show, in terms of the directing, the cinematography, the editing, the production design, the sound track, as well as the acting.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

TVST 368 Supernatural Fantasy TV Shows 3.0 Credits
We will examine television shows from the 1950's to the present that include vampires, werewolves, witches, ghosts, demons, monsters, and other beings with unusual abilities that arise from myths, legends, fairytales, and folktales (and not from scientific fact.) We will explore a variety of supernatural themes in television drama, including those that reflect our fears of the unknown and our desires to be more than we are. We will also discuss what goes into creating a high-caliber supernatural drama television show, looking at both the content and the form. We will discuss the writing, the directing, the production design, the camerawork, the sound, the editing, and the special effects.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

TVST 399 Independent Project: TVST 0.5-12.0 Credits
This course offers students the opportunity to do an Independent Project in Television Studies.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVST I199 Independent Study in TV Studies 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVST I299 Independent Study in TV Studies 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVST I399 Independent Study in TV Studies 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVST I499 Independent Study in TV Studies 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVST T180 Special Topics in TV Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVST T280 Special Topics in TV Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

TVST T380 Special Topics in TV Studies 3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 6 times for 18 credits

TVST T480 Special Topics in TV Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

Taxation

Courses

TAX 341 Individual Income Taxes 4.0 Credits
Surveys the tax structure of the United States, with emphasis on those portions of the Internal Revenue Code that affect the federal income tax liabilities of individuals. Considers the tax impact on individuals relating to compensation, portfolio income and business investments.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ACCT 115 [Min Grade: C]

TAX 342 Business Income Taxes 4.0 Credits
Considers the tax impact on business entities including corporations, partnerships, and S corporations of property acquisitions and dispositions, formation of a business, taxable income, redemption of ownership interest, liquidation of the entity and dividends and distributions.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.

TAX 353 Personal Income Taxes 4.0 Credits
Non-accounting majors only. Introduces the federal tax system, with emphasis on the individual income tax. Uses tax preparation software.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if major is ACCT or classification is Freshman

TAX 360 State and Local Taxation 4.0 Credits
This course provides a basic introduction to state and local taxation, with an emphasis on income and franchise taxes imposed on businesses. The course is designed to encompass all of the major topics relevant to multistate taxation, including recent legislative developments and state tax policy trends.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

TAX 390 Financial Planning and Taxes 4.0 Credits
The Financial Planning and Tax course introduces students to increase personal wealth due to the influence of tax on business and personal decision making. Thin influence of tax illustrated through class discussions and case assignments, which are real world personal financial and investments opportunities.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit
Prerequisites: TAX 341 [Min Grade: C]

TAX I199 Independent Study in TAX 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

TAX I299 Independent Study in TAX 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

TAX I399 Independent Study in TAX 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

TAX I499 Independent Study in TAX 0.5-4.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

TAX T180 Special Topics in TAX 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

TAX T280 Special Topics in TAX 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

TAX T380 Special Topics in TAX 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

TAX T480 Special Topics in TAX 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: LeBow College of Business
Repeat Status: Can be repeated multiple times for credit

Teacher Education

Courses

EDUC 101 Foundations in Education I: A Historical and Philosophical Perspective 3.0 Credits
In this course students are introduced to pedagogical and philosophical concepts, theories, methods and procedures in the historical context of education in America. Students develop an understanding of how schools work and of the teaching/learning dynamic through required mentoring activities.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 102 Foundations in Education II: Contemporary Issues 3.0 Credits
In this course students continue their exploration into the pedagogical and philosophical concepts, theories, methods and procedures in the context of contemporary education in America. Students develop an understanding of how schools work and of the teaching/learning dynamic through required mentoring activities.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 105 Freshman Pedagogy Seminar 1.0 Credit
Education majors only. Addresses observation skills focusing on classroom dynamics, i.e., what is teaching/learning, changing roles of teachers, learning styles, study skills, mentoring, journal writing/analysis, and the use of portfolios.
College/Department: School of Education
Repeat Status: Can be repeated 4 times for 4 credits
Restrictions: Can enroll if major is EDUC and classification is Freshman.

EDUC 112 Integrative Instruction: Focus on World Geography 3.0 Credits
Through the study of geography, encourages students to find a meaningful framework for understanding the system of human culture as it exists over the surface of Earth. Explores the use of technology in education.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is EDUC.

EDUC 113 Organizational Structure of Secondary Schools 3.0 Credits
Students will explore the organizational structure of high school programs and acquire competence in designing learner-oriented communities of practice in the classroom to foster student achievement and overall well-being.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDUC 123 [Min Grade: D]

EDUC 120 Child Development I: Typical Development 3.0 Credits
This course addresses the multifaceted complexities of child development, through discussion of classic and emerging theories. Students will recognize and apply developmental domains of theory and research in the field of child development.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 121 Child Development II: Atypical Development 3.0 Credits
Students will apply knowledge of typical growth and development in childhood to those children whose development is atypical. Key topics include newborn screening, patterns in development and cognitive testing. This course requires additional field experience hours.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDUC 120 [Min Grade: D]

EDUC 123 Adolescent Development 3.0 Credits
This course addresses the complexities of adolescent development, through discussion of theories. It uses research-based, real-world, and cross-cultural examples. It aims to foster the student's ability to recognize and apply connections among developmental domains, theory, and research with the field of human development. This course requires additional field experience hours.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 201 Instructional Issues 3.0 Credits
This course explores and offers in-depth analysis of relevant theories relating to contemporary application of instructional issues, systems and design. The purpose is to provide theoretical, experimental and critical perspectives on instructional issues and design as it is applied in a number of educational venues.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 205 Sophomore Pedagogy Seminar 1.0 Credit
Education majors only. Builds on the freshman seminar and incorporates service learning as an instructional strategy.
College/Department: School of Education
Repeat Status: Can be repeated 3 times for 4 credits
Restrictions: Can enroll if major is EDUC and classification is Pre-Junior or Sophomore .

EDUC 210 Early Language Development 3.0 Credits
Provides preservice teachers an overview of language development in the early years of a child's life from birth to age five, in the home and school settings. Topics include; phonological awareness, acquisition of phonetic knowledge, semantic understanding and syntactic use. This course requires additional field experience hours.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 216 Diversity and Today's Teacher 3.0 Credits
This course explores major issues related to the increasing diversity of students in elementary and secondary classrooms in the United States. The multifaceted challenges of teaching heterogeneous student populations.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 223 Teaching the Middle School Child 3.0 Credits
This course will explore the middle school environment, developmentally appropriate middle school programs, strategies for supporting students through the transition to middle school, and the impact of peer pressure on the middle school child. The course requires the candidate to apply theories learned in EDUC 123: Adolescent Development to the classroom setting.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDUC 123 [Min Grade: D]

EDUC 236 Early Literacy I 3.0 Credits
This course examines research-validated literacy instruction and literacy interventions. Topics will include phonics, fluency, comprehension, vocabulary, and the reading-writing connection. Emphasis is placed on the scio-cultural aspects of reading. Focus is also placed on literacy instruction across the curriculum.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 258 Reading in the Content Areas 3.0 Credits
This introductory course is designed to help all (7-12) teacher candidates improve their students' reading, writing, research and discussion skills in school and for lifetime learning. The course will focus on important formats and strategies for learning to read and write well and to learn in any subject.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 305 [WI] Junior Pedagogy Seminar 1.0 Credit
Education majors only. Continues further exploration of relationships among service learning, content knowledge, pedagogy knowledge, learner characteristics utilizing generic influences, special needs students, and motivation techniques.
College/Department: School of Education
Repeat Status: Can be repeated 2 times for 3 credits
Restrictions: Can enroll if major is EDUC and classification is Junior.

EDUC 306 Assessment of Young Children I 3.0 Credits
Students will gain an understanding of the role of the assessment process in early education. Students will explore evaluation procedures and classroom-based data collection strategies for young children in inclusive education settings. Course covers 3 major functions of assessment: program planning, program monitoring and program evaluation.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 308 Creating a Positive Classroom Climate 3.0 Credits
This course focuses on the practical aspects of classroom management, school safety and other critical social issues that relate to providing a positive and productive learning environment, particularly in under-served classroom settings. Specific focus in this course will be dedicated "knowing the learner", identifying individual student needs, building rapport and constructing a "democratic classroom". Additional emphasis will be placed on teacher leadership and how each pre-service candidate will develop his/her own approach to leading and managing a PK-12 classroom.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 310 Computer Applications in Teaching 3.0 Credits
Studies the unique characteristics of the microcomputer as an instructional tool in elementary and secondary school instruction. Provides students with an understanding of the instructional versatility and limitations of microcomputing through hands-on experience with applications in their subject-matter fields. Addresses issues concerning techniques for integrating computing into instruction.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 311 Computer Applications in Curriculum Development 3.0 Credits
This course presents major instructional design concepts that students will use in developing their own curricular materials. It describes various kinds of teacher-developed instructional tools in relation to appropriate instructional task or learning environment.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDUC 310 [Min Grade: B]

EDUC 312 Educational Policy, Law & Advocacy 3.0 Credits
This course introduces students to the complexities of the law and policy that shape public schooling in the U.S. Emphasis is placed on how education law and policy impact and are impacted by teachers' evolving roles, relationships, and practices. Additionally, the course provides students with foundational information and tools they will need in order to advocate, as teachers, for students and for themselves.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 314 Science Teaching Methods 3.0 Credits
This course bridges theory and practice, providing hands-on experience in the application of constructivist learning theory to designing and delivering effective classroom experiences in the area of science.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 315 Secondary Science Teaching Methods 3.0 Credits
Methods for teaching middle and secondary school science are explored including strategies and technologies to support student learning as defined by the state and national science standards. Inquiry-based model of learning and assessment emphasized. Theory and practice bridged to provide hands-on experiences in application of constructivist learning theory and effective classroom experiences.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 316 Teaching in Urban Contexts 3.0 Credits
This course enables students to understand the complex conditions that have led to issues that impact urban education. The course will explore recent reform efforts focused on changing the organizational structure and curriculum. Specific emphasis will be placed on the teacher's disposition towards the learner, the impact of racism and knowledge and skills related to teaching in urban settings. This course will introduce historical references for the current condition of urban schools as well as the aspects of teaching that lead to a classroom of respect and rapport for the urban learner and his/her family.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 322 Evaluation of Instruction 3.0 Credits
Permits students to acquire competence in new evaluation techniques, including portfolios, journals, performance assessments, individual and collaborative projects, and presentations. Covers qualitative and quantitative assessment used in measuring student achievement. Teaches techniques for grading and reporting pupils' classroom performance in cognitive, affective, and (where appropriate) motor tasks. The course is directed toward instruction in elementary and high school settings.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

EDUC 324 Current Research in Curriculum & Instruction 3.0 Credits
Examines the theories and assumptions underlying various approaches to instruction for elementary and high school teaching. Included are areas such as a) knowledge acquisition and critical reasoning in mathematics and science, b) teaching general and specific skills as related to content material, c) study skills and abilities to learn, and d) the roles of memory and metacognition in learning. Explores these processes of human cognition and learning with particular attention to how conditions that foster them might be built into materials, pedagogy, and learning environments.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 325 Multimedia in Instructional Design 3.0 Credits
Imparts skills in selecting, using, and evaluating a range of instructional media, including interactive multimedia formats, in relation to educational goals and learner characteristics. Emphasizes presentation skills when using a variety of media to deliver instruction. Students design and write a software prototype as a group design project.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: EDUC 310 [Min Grade: B]

EDUC 326 [WI] Language Arts Processes 3.0 Credits
Studies the nature of language, including phonetic, semantic, and syntactic aspects of language development, and theories of language development. Applies contemporary research to processes and problems in teaching oral and written communication. Assumes that listening, speaking, writing, and reading in the content area are integrated processes and should be taught as such. This is a writing intensive course.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

EDUC 328 Language Arts Processes 4-8 3.0 Credits
This course develops knowledge and competencies for teaching adolescent literacy in grades 4-8. Students will use supportive contexts, diverse texts, ongoing assessments, and technology to engage learners in developing self-directed, life-long literacy skills across all disciplines.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 335 Engaging the Learner 3.0 Credits
This course provides multiple approaches to the critical linked processes of assessment, curriculum development, and inclusive instruction of all young children. Topics of study include: planning and preparation, using appropriate materials, scope and sequence and strategies for student-centered assessments.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 336 Early Literacy II 3.0 Credits
This course focuses on teaching strategies that are effective in developing students' writing abilities within a literacy rich environment. The interrelationship between reading and writing will be emphasized. Additional field experience hours are required for this course.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDUC 236 [Min Grade: D]

EDUC 338 Expressive Arts for PK-4 3.0 Credits
The focus of this course is to teach educators to develop and incorporate relevant curriculum for the expressive arts (dance, music, theatre and visual arts) into the PK-4 classroom(s). Students will explore instructional strategies, modern technologies, stages of artistic development and multicultural art forms.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 355 Social Studies Teaching Methods 3.0 Credits
This course focuses on the effective, responsible and ethical teaching of social studies in the elementary classroom. Topics include; perspectives of social studies, curriculum standards, unit development, assessment design, integrated curriculum and technology, and teacher decision-making.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 356 Secondary Social Studies Methods 3.0 Credits
Students will be able to identify content and appropriate pedagogy strategies for the various National Council for the Social Studies disciplinary standards for history, geography, civics, economics and psychology. Major curriculum movements and teaching diverse learners are also explored. Classroom-based experiences are required.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 358 English Teaching Methods 3.0 Credits
This course is designed to support the development of pre-service teachers in the middle and secondary English/Language Arts classroom. Students will be provided opportunities to integrate and apply theories of learning, curriculum and pedagogy to instruction of English/Language Arts. Students will also be required to make connections between theory and current research to classroom instruction and examine best practices in working with struggling readers and writers in the secondary classroom. Classroom-based experiences are required.
College/Department: School of Education
Repeat Status: Can be repeated 1 times for 6 credits
Prerequisites: EDUC 101 [Min Grade: B]

EDUC 360 English/Language Arts Teaching Methods for the Middle Years 1.5 Credit
The course prepares pre-service teachers to teach reading and writing to adolescents in middle years classrooms by providing knowledge of the literacy needs of middle level learners with emphasis on reading and writing development, methodology, assessment and accountability. The latest research findings are reflected in studies of how middle level learners require instructors to be adept at a breadth of instruction. Strategies and methods for assisting adolescents are provided as they become fluent readers and writers.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 361 Middle Years Science Methods 1.5 Credit
This course examines the many aspects of the teaching of science in elementary schools today. The role of national and state standards (e.g., National Science Education Standards, the Next Generation of Science Standards, and the Pennsylvania State Standards) in curriculum development and reform is explored in depth. Topics covered include planning science instruction to include inquiry and integrated concepts, developing authentic assessments involving a variety of tools, creating and maintaining a safe laboratory and learning environment that meets the needs of diverse learners, and the integration of technology into science education. Classroom-based field hours will be required.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 362 Middle Years Social Studies Methods 1.5 Credit
This course prepares pre-service teachers with the skills to plan, design and teach adolescents a social studies curriculum with appropriate assessments based on national and state standards related to middle year social studies (e.g., National Council for Social Studies, PA Department of Education) encompassing geography, history, civics and government, and economics. Preparation includes exploration of adolescent development, subject matter pedagogy, assessment and intervention for students with disabilities and English Language Learners. Classroom-based field hours will be required.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 363 Middle Years Mathematics Methods 1.5 Credit
This course focuses on critical knowledge and skills for teaching mathematics in middle years, including learning theories and psychology in mathematics education, mathematics curricula, teaching mathematics, technology, assessment, and meeting individual student needs. The major goal is to provide prospective middle school teachers the opportunity to develop concepts, skills, and pedagogical procedures for effective teaching of mathematics in middle years. Additionally, we will consider important social and cultural aspects of teaching math that impact student learning, as well as reflect on how teaching mathematics can be made exciting, intriguing, and understandable for students.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 365 Foundations in Instructing English Language Learners 3.0 Credits
This course explores principles and theory of second language and literacy acquisition, billingualism, academic language competence and linguistics, and instructional approaches based on these principles. This course requires additional field experience hours.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 405 Senior Pedagogy Seminar 1.0 Credit
Education majors only. Focuses on the teacher as a researcher. Presents descriptions of collaborations between university faculty and faculty from K-12 schools and discusses student involvement in learning and pedagogy issues.
College/Department: School of Education
Repeat Status: Can be repeated 2 times for 3 credits
Restrictions: Can enroll if major is EDUC and classification is Senior.

EDUC 407 Student Teaching Seminar 1 3.0 Credits
This seminar course is designed to compliment the Student Teaching capstone, field experience by developing the pre-service teacher's teaching knowledge and strengths throughout their field placement, supervision, and reflective practice. The goal of the seminar is to create reflective practitioners by providing a forum for collaborative, critical inquiry based on the field experience.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDUC 408 Student Teaching Seminar 2 3.0 Credits
This seminar course is designed to compliment the second Student Teaching capstone, field experience for by pre-service teacher's participating in a Teacher Residency model. The seminar develop's the pre-service teacher's teaching knowledge and strengths through field placement, supervision, and reflective practice. The goal of the seminar is to create reflective practitioners by providing a forum for collaborative, critical inquiry based on the field experience.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit
Prerequisites: EDUC 407 [Min Grade: B]

EDUC 409 Student Teaching Seminar I 9.0 Credits
This course is part one of a two-course requirement specifically aligned with the teacher candidate's full-time, twenty-four week Student Teaching experience. The course is designed to develop one's teaching knowledge and strengths through classroom practice, supervision and reflective practice. In this seminar, students will share experiences through reflective journaling, discuss best practices in instruction, learn about resources, reflect on what is being encountered in the field and begin to construct professional teaching portfolios. Through this course candidates will be evaluated according to the four domains of effective teaching and learning, which include; planning and preparation, instructional delivery, the classroom environment and professionalism.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 410 [WI] Student Teaching 9.0 Credits
A 12-week field experience that approximates full time classroom teaching and related activities; it is designed to allow the candidate to demonstrate competencies necessary for certification. This is a writing intensive course.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

EDUC 411 Family and Community Partnerships 3.0 Credits
This course focuses on the process of family assessment and intervention, issues of family and professional collaboration and diversity, and methods of promoting adult communication and management strategies. It applies knowledge of socio-cultural and political contexts as they relate to the family, culture and society.
College/Department: School of Education
Repeat Status: Not repeatable for credit

EDUC 414 Special Education: Field Placement Seminar 9.0 Credits
This course is designed to develop special education teaching knowledge, skills and abilities through field placement, supervision and reflective practice. Activities include; journaling, best practice workshops and reflecting on relevant case studies.
College/Department: School of Education
Repeat Status: Not repeatable for credit
Prerequisites: EDUC 142 [Min Grade: D] and EDUC 244 [Min Grade: D] and EDUC 346 [Min Grade: D] and EDUC 347 [Min Grade: D] and EDUC 348 [Min Grade: D] and EDUC 349 [Min Grade: D] and EDUC 350 [Min Grade: D] and EDUC 351 [Min Grade: D] and EDUC 352 [Min Grade: D] and EDUC 353 [Min Grade: D]

EDUC I199 Independent Study in EDUC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDUC I299 Independent Study in EDUC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDUC I399 Independent Study in EDUC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDUC I499 Independent Study in EDUC 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit
Restrictions: Cannot enroll if classification is Freshman

EDUC T180 Special topics in EDUC 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDUC T280 Special topics in EDUC 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDUC T380 Special topics in EDUC 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

EDUC T480 Special topics in EDUC 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: School of Education
Repeat Status: Can be repeated multiple times for credit

Theatre

Courses

THTR 110 Voice and Articulation 3.0 Credits
A beginning course in speech for the stage. The study of standard American speech, techniques for vocal projection, oral interpretation and the effective use of the voice on stage.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

THTR 115 Theatrical Experience 3.0 Credits
This course explores the Theatrical Experience from a non-practitioner's perspective. Through lectures, demonstrations, slides and videos students will examine the roles of theatre artists and how they combine their efforts in creating a unique Theatrical Experience.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

THTR 116 Philadelphia Theatre Let's Go! 3.0 Credits
Philadelphia Theatre Let's Go! exposes students to the variety of theatrical opportunities available in the Philadelphia region. Through research, discussion and attendance at theatrical productions, students will enhance their abilities to discuss, evaluate and enjoy theatre.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

THTR 121 [WI] Dramatic Analysis 3.0 Credits
Through the reading of play-scripts, this course will expose students to a variety of methods of play analysis that can be applied to the various theatre disciplines (production, performance, and design). It will also provide students with the methodology to be used in the Theatre History and upper theatre courses. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

THTR 130 Introduction to Theater Production Practicum 1.0 Credit
Provides an introduction to the tools, equipment and basic procedures required to enable students to participate in the technical aspects of a theatrical production.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

THTR 131 Theatre Performance Practicum 1.0 Credit
Provides practical experience in acting for the stage. Requires student to play a role in a Department of Performing Arts theatre production. May be repeated for credit.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

THTR 132 Theatre Production Practicum 1.0 Credit
Provides practical experience in theatre production. Requires students to participate in planning, preparation, and completion of a realized production as a crew head or crew member. May be repeated for credit.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Prerequisites: THTR 130 [Min Grade: D]

THTR 133 Theatre Management Practicum 0-1 Credits
This class provides practical experience in Theatre Management including Production Management, Stage Management, Box Office Management, and other Administrative Management areas for live theatrical events. Students are required to participate in a production for the Theatre Program.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

THTR 134 Open Mic Management Practicum 0-1 Credits
Students will gain hands on experience running a performance venue on campus. Students are responsible for daily operations of Late Night Series Productions including: financial operations, strategic planning, artistic management, volunteer coordination, strategic partnerships, artist recruitment and management, marketing, and internet presence. Also all production elements including: sound design and operation, light design and operation, and stage management and run crew.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

THTR 141 Theatre Performance Ensemble 0-1 Credits
The Theater Performance Ensemble focuses on a specific area of performance training, creation, and research to supplement the standard theater curriculum in performance. Each quarter focuses on a specific area with emphasis on learning as an ensemble and a priority on developing new skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

THTR 142 Director's Lab Practicum 0-1 Credits
This course provides practical experience in acting for the stage through participation in a student directed one-act play in conjunction with the Play Directing Class.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

THTR 143 Musical Theatre Cabaret 0-1 Credits
An introductory course for singers and non-singers emphasizing applying acting techniques to the performance of a song. Focus will be placed on lyrics, and advancing dramatic action through the song. The class will conclude with a public performance of the material students have worked on in class.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

THTR 144 NewWorks Festival Performance Practicum 0-1 Credits
This course provides practical experience in acting and dramaturgy for the stage through the participation, development, and performance of student written plays.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

THTR 209 Improvisation for the Theatre 3.0 Credits
This course is designed to develop spontaneity and increase listening skills. It will begin with exercises in trust building, listening and ensemble building. It will then progress to scenes to increase skill, and by the end of the quarter students will learn long form work that will lead to performance.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

THTR 210 Acting: Fundamentals 3.0 Credits
Introductory acting course. Covers basic exercises, improvisations, fundamentals of voice production, and stage movement.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

THTR 211 Acting: Scene Study 2.0 Credits
Continues THTR 210. Intermediate course in acting, focusing on application of the techniques of acting through scene study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 5 times for 10 credits
Prerequisites: THTR 210 [Min Grade: D]

THTR 212 Sketch Comedy 3.0 Credits
This course explores the various techniques employed by sketch comedians to imagine and create scripts which spring from a specific point of view. Through exercises and assignments, sketch comedy will be explored as it relates to collaborates writing, improvisation, character development and the rehearsal process.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

THTR 221 [WI] Theatre History I 3.0 Credits
This course will expose students to the origins of drams from antiquity through the Jacobean period. Through the reading of plays and text, students will explore the relationship of the drama to the social, political, and trends within a given period and how they influenced one another. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: THTR 121 [Min Grade: D] or HUM 103 [Min Grade: D] or HUM 105 [Min Grade: A] or HUM 108 [Min Grade: D] or ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: A] or ENGL 103 [Min Grade: D]

THTR 222 [WI] Theatre History II 3.0 Credits
This course continues the study of drama beginning with the Restoration and continuing through the modern era. Through the reading of plays and texts, students will explore the relationship of the drama to the social, political, and economic trends within a given period and how the influenced one another. This is a writing intensive course.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

THTR 231 Introduction to Musical Theatre 3.0 Credits
The Musical is one of America's greatest contributions to the world of theatre. Through class discussions, viewing live performance, audio/video examples, and readings students will explore the development of the American Musical from the Minstrel show through the Golden Age of the Musical.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

THTR 232 Contemporary Musical Theatre 3.0 Credits
The Musical is one of America's greatest contributions to the world of theatre. Through class discussions, viewing live performance, audio/video examples, and readings students will analyze the changes in the American Musical form beginning in the 1960s to the present and predict its future direction.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

THTR 240 Theatre Production I 3.0 Credits
Uses lectures, discussions, and practical experience to introduce the processes and equipment used in the production of plays, including scenery construction, lighting, sound, and costuming.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

THTR 241 Theatre Production II 3.0 Credits
Covers advanced applications of techniques of stagecraft, including drafting, stage machinery, lighting, painting, and property construction.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: THTR 240 [Min Grade: D]

THTR 260 Production Design 3.0 Credits
This course will allow students to expand on principles learned in Dramatic Writing enabling them to develop and communicate, through a variety of means, a unified production concept for a playscript. Students will present their designs in the areas of scenery, costumes and lighting demonstrating their ability to translate their production concept into theatrical reality.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

THTR 320 Play Direction 3.0 Credits
Introduces the art of directing, including play analysis, interpretation, rehearsal procedures, techniques of blocking, composition, picturization, and director-actor communications.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: THTR 211 [Min Grade: D] and THTR 121 [Min Grade: D]

THTR 360 Lighting Design 3.0 Credits
This course provides students with a complete introduction to the Theatrical Lighting Design, including discussions of color, composition, movement and electricity. Students apply the principles discusses in a theatre laboratory setting and are prepared to create innovative and practical designs for the stage.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

THTR 380 Special Topics in Theatre 0.5-12.0 Credits
Covers selected topics in theatre. May be repeated for credit if topics vary.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

THTR 495 Directed Studies in Theatre 0.0-12.0 Credits
Provides supervised individual study of special subjects in theatre. May be repeated for credit.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

THTR I199 Independent Study in THTR 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

THTR I299 Independent Study in THTR 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

THTR I399 Independent Study in THTR 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

THTR I499 Independent Study in THTR 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

THTR T180 Special Topics in Theatre 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

THTR T280 Special Topics in Theatre 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

THTR T380 Special Topics in Theatre 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

THTR T480 Special Topics in Theatre 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

University - Wide Courses

Courses

UNIV R101 The Drexel Experience 0.0-2.0 Credits
This course introduces first year students to university life, his/her major, our community, and Co-op.
College/Department: School of Biomedical Engineering, Science Health Systems
Repeat Status: Can be repeated 5 times for 4 credits

University - Wide Courses

Courses

UNIV H101 The Drexel Experience 0.0-2.0 Credits
This course introduces first year students to university life, his/her major, our community, and Co-op.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 5 times for 4 credits

UNIV H201 Looking Forward: Academics and Careers 1.0 Credit
Just as UNIV 101 introduces students to the University and the major, UNIV 201 prepares students for their post-college future. Through developing a portfolio of work, creating reflections on the undergraduate experience and coop, learning about job and graduate school opportunities, and preparing for the senior year, students prepare for graduation and beyond.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

UNIV S101 The Drexel Experience 0.0-2.0 Credits
This course introduces first year students to university life, his/her major, our community, and Co-op.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 5 times for 4 credits

UNIV S201 Looking Forward: Academics and Careers 1.0 Credit
Just as UNIV 101 introduces students to the University and the major, UNIV 201 prepares students for their post-college future. Through developing a portfolio of work, creating reflections on the undergraduate experience and coop, learning about job and graduate school opportunities, and preparing for the senior year, students prepare for graduation and beyond.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

University - Wide Courses

Courses

UNIV G101 The Drexel Experience 0.0-2.0 Credits
This course introduces first year students to university life, his/her major, our community, and Co-op.
College/Department: GC-3690
Repeat Status: Can be repeated 5 times for 4 credits

University - Wide Courses

Courses

UNIV E101 The Drexel Experience 0.0-2.0 Credits
This course introduces first year students to university life, his/her major, our community, and Co-op.
College/Department: College of Engineering
Repeat Status: Can be repeated 5 times for 4 credits

University - Wide Courses

Courses

UNIV A101 The Drexel Experience 0.0-2.0 Credits
This course introduces first year students to university life, his/her major, our community, and Co-op.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 5 times for 4 credits

University - Wide Courses

Courses

UNIV 241 Great Works Symposium 3.0 Credits
The Great Works Symposium is a series of team-taught, interdisciplinary courses, designed to develop into a foundation curriculum for all Drexl undergraduates. Each course is focused on a great human achievement, which may be literary, technological or social, such as The Atomic Bomb, The Internet, The Bhagavad-Gita, The Brooklyn Bridge, or Christmas.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit

UNIV PE101 The Drexel Experience 0.0-2.0 Credits
This course introduces first year students to university life, his/her major, our community, and Co-op.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated 5 times for 4 credits

University - Wide Courses

Courses

UNIV 181 Freshman Academic Seminar I 1.0 Credit
The Freshman Academic Seminar (FAS) classes are what give the Freshman Academic Seminar Program its name. The goal of this course is to help students better adjust to their first year at Drexel and navigate the campus, as well as the city of Philadelphia. Students will be paired with a student mentor who is an alumnus of this program. Classes will be facilitated by FAS staff, program mentors, and guest lecturers.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Freshman.

UNIV 182 Freshman Academic Seminar II 0.5 Credits
This course is part two of three. The Freshman Academic Seminar (FAS) classes are what give the Freshman Academic Seminar Program its name. The goal of this course is to help students adjust to their first year at Drexel as both a student and as an individual. Classes will be facilitated mainly by guest lecturers, but may also include FAS staff. Students will be required to participate in group activities which may include additional time spent outside of the classroom exploring Philadelphia.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Freshman.

UNIV 183 Freshmen Academic Seminar III 0.5 Credits
This course is part three of three. The Freshman Academic Seminar (FAS) classes are what give the Freshman Academic Seminar Program its name. The goal of this course is to provide students with knowledge beyond the scope of the classroom by listening to talks and engaging in activities that broaden students' experiences. Students will participate in group activities aimed at enhancing global competence and responsible citizenship. Guest speakers will discuss communication skills, ethical reasoning, professional practice and growth.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Freshman.

UNIV 241 Great Works Symposium 3.0 Credits
The Great Works Symposium is a series of team-taught, interdisciplinary courses, designed to develop into a foundation curriculum for all Drexl undergraduates. Each course is focused on a great human achievement, which may be literary, technological or social, such as The Atomic Bomb, The Internet, The Bhagavad-Gita, The Brooklyn Bridge, or Christmas.
College/Department: Pennoni Honors College
Repeat Status: Can be repeated multiple times for credit

UNIV 320 Writing and Peer Tutoring Workshop 3.0 Credits
This is a writing intensive course.
College/Department: University Courses
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore
Prerequisites: HUM 103 [Min Grade: D] or HUM 105 [Min Grade: A] or HUM 108 [Min Grade: D] or ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: A]

UNIV T180 Special Topics-University Wide 0.0-3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: University Courses
Repeat Status: Can be repeated multiple times for credit

UNIV T280 Special Topics-University Wide 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: University Courses
Repeat Status: Can be repeated multiple times for credit

UNIV T380 Special Topics-University Wide 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: University Courses
Repeat Status: Can be repeated multiple times for credit

UNIV T480 Special Topics-University Wide 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: University Courses
Repeat Status: Can be repeated multiple times for credit

UNIV X101 The Drexel Experience 0.0-2.0 Credits
College/Department: University Courses
Repeat Status: Can be repeated 1 times for 8 credits

University - Wide Courses

Courses

UNIV B101 The Drexel Experience 1.0 Credit
This course introduces first year students to university life, his/her major, our community, and Co-op.
College/Department: LeBow College of Business
Repeat Status: Not repeatable for credit

UNIV B201 [WI] Career Management 1.0 Credit
This is a career capstone course for LeBow seniors. At the completion of this course, students will be able to clearly articulate relevant knowledge, skills, abilities and strategies for reaching professional goals, post-graduation.
College/Department: LeBow College of Business/General Business
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if classification is Senior.

UNIV SM101 The Drexel Experience 0.0-2.0 Credits
This course introduces first-year students to university life, his/her major, our community, and co-op.
College/Department: LeBow College of Business
Repeat Status: Can be repeated 3 times for 8 credits

University - Wide Courses

Courses

UNIV T101 The Drexel Experience 0.0-2.0 Credits
This course introduces first year students to university life, his/her major, our community, and Co-op.
College/Department: School of Education
Repeat Status: Can be repeated 5 times for 4 credits

UNIV T180 Special Topics-University Wide 0.0-3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: University Courses
Repeat Status: Can be repeated multiple times for credit

UNIV T280 Special Topics-University Wide 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: University Courses
Repeat Status: Can be repeated multiple times for credit

UNIV T380 Special Topics-University Wide 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: University Courses
Repeat Status: Can be repeated multiple times for credit

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UNIV T480 Special Topics-University Wide 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: University Courses
Repeat Status: Can be repeated multiple times for credit

Visual Studies

Courses

VSST 100 Introduction to Art & Design 3.0 Credits
In this course students will explore the main concepts and principles of design and color through studio assignments, lectures and field trips. What is Design? How does it relate to your major, and how can it be applied to your daily life? We will study visual theory and learn how to organize visual information. The importance of using visual knowledge/perception to make decisions will be stressed.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

VSST 101 Design I 0.0-4.0 Credits
Focuses on two-dimensional space, black and white, and appropriate tools and materials.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

VSST 102 Design II 4.0 Credits
Expands the visual vocabulary to include color theory. Continues the process of discovery and visual decision-making.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 101 [Min Grade: D] or VSST 104 [Min Grade: D] or VSST 108 [Min Grade: D]

VSST 103 Design III 0.0-4.0 Credits
Covers the perception and ordering of three-dimensional space. Includes new methods and materials in the continuing process.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 102 [Min Grade: D] or VSST 105 [Min Grade: D] or VSST 109 [Min Grade: D]

VSST 104 Accelerated Design I 2.0 Credits
This is an accelerated course offered as a substitute for VSST 101. The work concentrates on two-dimensional space with a primary focus in black and white. The course is 8 hours per week delivered in three weeks.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

VSST 105 Accelerated Design II 2.0 Credits
This is an accelerated course offered as a substitute for VSST 102. The work concentrates on color, expanding the two-dimensional vocabulary. The course is 8 hours per week delivered in three weeks.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 101 [Min Grade: D] or VSST 104 [Min Grade: D] or VSST 108 [Min Grade: D]

VSST 106 Accelerated Design III 2.0 Credits
This is an accelerated course offered as a substitute for VSST 103. The work concentrates on three-dimensional space with a primary focus on materials and craftsmanship. The course meets 8 hours per week delivered in four weeks.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 102 [Min Grade: D] or VSST 105 [Min Grade: D] or VSST 109 [Min Grade: D]

VSST 107 Introduction to Design for Media 3.0 Credits
This is an introductory course in which students will learn and use the essential concepts and language associated with design employing a variety of both black and white and color media combining hand and computer approaches.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

VSST 108 Design I for Media 3.0 Credits
Design for Media I is a hybrid studio and digital course, introducing the visual language of two-dimensional design. Students will be given a series of visual problems in black and white to solve through the combination of studio media (including paint, collage, cut paper, and mixed media) and digital media (including pixel, vector, and motion based software.) With the completion of these integrated projects, students will gain an understanding of the elements and principals of design in relation to media-based disciplines and have the basic skill sets to guide them into Design for Media II.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

VSST 109 Design II for Media 3.0 Credits
Introductory color design course for media majors combining hand and computer approaches. Builds on the design lesions of VSST 108 Design I for Media.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is ANFX or major is GDAP or major is IDM.
Prerequisites: VSST 108 [Min Grade: D]

VSST 110 Introductory Drawing 3.0 Credits
Provides basic understanding of the perceptual problems in drawing, including how three-dimensional objects can be represented on a two-dimensional surface.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

VSST 111 Figure Drawing I 3.0 Credits
Introduces drawing of the human figure, with emphasis on composition and shape-area relationships.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 110 [Min Grade: D]

VSST 112 Figure Drawing II 3.0 Credits
Continues VSST 111. Covers developing mass and form in the human figure.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 111 [Min Grade: D]

VSST 113 Figure Drawing for Fashion 3.0 Credits
This is an advanced figure drawing class that bridges observational figure drawing and fashion illustration. While focusing on the structure of the body and its rhythms, students will also be introduced to elements of stylization of the figure.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 110 [Min Grade: D] and VSST 111 [Min Grade: D]

VSST 114 Tablet Drawing 3.0 Credits
An introductory course to digital visual note-taking and painting. Observation is emphasized, as is visual organization, experimentation and conceptualization. The class will meet at various locations on the Drexel campus as well as locations throughout the city.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

VSST 201 Multimedia: Performance 4.0 Credits
Investigates 4D design (the organization of space over time) using objects, light, sound, movement, gesture, and language in solo and group presentations. Incorporates conceptualization, experimentation, perception and analysis.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

VSST 202 Multimedia: Space 0.0-4.0 Credits
Concentrates on environment and spatial concepts. Expands previous concern with the object and personal space to envision space and the action within. Requires students to work individually or in groups to create works at this new scale.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: VSST 102 [Min Grade: D] or VSST 105 [Min Grade: D]

VSST 203 Multimedia: Materials 4.0 Credits
This course augments the design studio experiences by introducing the influence of material characteristics and fabrication techniques. Students learn how to design projects, reduce them to the specific parts, make the parts and assemble the work in a coordinated sequence. Work is done in the Visual Studies Arts Annex woodshop.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: VSST 102 [Min Grade: D] or VSST 105 [Min Grade: D] or VSST 109 [Min Grade: D]

VSST 210 Painting Basics 3.0 Credits
Painting Basics explores the fundamentals of making representational paintings. Working from direct observation, students learn the hands-on practices, materials and concepts of painting applicable to digital representation. Projects that use still life, interior and landscape subjects address design, composition and proportion as well as the effective use of color contrasts to create illumination and spatial depth. Water-based media will be used.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 108 [Min Grade: D]

VSST 301 Painting I 4.0 Credits
New techniques, materials, and terminology, are introduced through a series of assignments based on observations of still life's and life models. Emphasis is placed on the application of color to articulate space and the development of individual expression.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: VSST 102 [Min Grade: D] or VSST 105 [Min Grade: D] or VSST 109 [Min Grade: D]

VSST 302 Painting II 4.0 Credits
Expands the techniques, methods and materials covered in Painting 1. Representational and abstract styles are explored. Using techniques of observation and imagination, new approaches to painting are encouraged.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 301 [Min Grade: C]

VSST 303 Painting III 4.0 Credits
Painting 3 expands on the ideas, methods, and materials, covered in Painting 1 and 2. Students formulate a self-styled project that focuses on a particular approach to painting. Emphasis is placed on mastering technical ability, and inventing imaginative solutions to challenges that arise in the project's completion.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 302 [Min Grade: C]

VSST 304 Materials Exploration 4.0 Credits
This course examines the relationship of materials and design principles as they relate to wearable art forms.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 103 [Min Grade: D] or VSST 106 [Min Grade: D]

VSST 310 Sculpture: Metal Fabrication 4.0 Credits
This specialized course teaches welding and metal fabrication techniques that students use to develop a series of projects. Students also experiment with alternative material combinations and investigate the use of metal in contemporary sculpture.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 2 times for 8 credits
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: VSST 102 [Min Grade: D] or ARCH 102 [Min Grade: D] or VSST 109 [Min Grade: D]

VSST 311 Sculpture I 4.0 Credits
This course focuses on idea development, the creative application of materials and process, and introducing basic wood and metal working tools and techniques. Projects bring these elements together with an emphasis on investigating new media and developing critical dialogue as it pertains to discussing and evaluating artwork.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: VSST 103 [Min Grade: D] or VSST 106 [Min Grade: D]

VSST 312 Sculpture II 0.0-4.0 Credits
Continues VSST 311.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: VSST 311 [Min Grade: D]

VSST 313 Sculpture III 0.0-4.0 Credits
Continues VSST 312.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: VSST 312 [Min Grade: D]

VSST 321 Screenprint I 4.0 Credits
Water based and photographic techniques are combined to create painterly and precise imagery in the building of a body of work. Techniques may include stencil-making, digitizing, mono-printing and color exploration. This course introduces the foundations of technical skills, language and theories used by the artist as printmaker.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: VSST 102 [Min Grade: D] or VSST 105 [Min Grade: D] or VSST 109 [Min Grade: D]

VSST 322 Printmaking I 4.0 Credits
Explores various printmaking techniques including but not exclusive of photographic lithography, relief block printing and screen-printing. Drawing processes and mixed media are emphasized. The foundations of technical skills, language and theories used by the artist as printmaker are introduced.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 102 [Min Grade: D] or VSST 105 [Min Grade: D] or VSST 109 [Min Grade: D]

VSST 323 Printmaking II 4.0 Credits
A continuation of Printmaking I, exploring techniques to a greater depth. Drawing, photographic processes and mixed media are emphasized. The foundations of technical skills, language and theories used by the artist as printmaker are introduced.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 322 [Min Grade: D]

VSST 324 Advanced Printmaking 4.0 Credits
Explores combination-printmaking, portfolio development and building a cohesive body of work. Techniques may include mixed media printmaking, digital and alternative media. Students will document their work and develop an artistic statement. The foundations of technical skills, language and theories.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 321 [Min Grade: D] or VSST 322 [Min Grade: D]

VSST 325 Screenprint II 4.0 Credits
A continuation of Screenprinting I, exploring techniques to a greater depth. Techniques may include stencil-making, digitizing, mono-printing and color exploration. This course introduces the foundations of technical skills, language, and theories used by the artist as printmaker.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VSST 321 [Min Grade: D]

VSST 350 Painting Special Studies 4.0 Credits
Special Studies expands on the ideas, methods and materials covered in Painting 1, 2 & 3. Students formulate a project that will be the focus of their study over the term. The project will provide the motivation for the research, technical and conceptual development of a new body of work and be accompanied by an artist statement regarding the work.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 1 times for 8 credits
Prerequisites: VSST 303 [Min Grade: C]

VSST 399 Independent Study: Visual Studies 0.5-12.0 Credits
Provides individualized study in visual studies in a specialized area of study. May be repeated for credit. Department permission required.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit
Restrictions: Can enroll if classification is Junior or Senior.

VSST I199 Independent Study in Visual Studies 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

VSST I299 Independent Study in Visual Studies 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

VSST I399 Independent Study in Visual Studies 0.5-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

VSST I499 Independent Study in Visual Studies 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

VSST T180 Special Topics in Visual Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

VSST T280 Special Topics in Visual Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

VSST T380 Special Topics in Visual Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

VSST T480 Special Topics in Visual Studies 0.0-3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

VR and Immersive Media Design

Courses

VRIM 100 Digital Tools for VR/AR Media 3.0 Credits
Students will learn fundamentals of digital tools used for creating
Immersive Media including Virtual Reality (VR) and Augmented Reality
(AR) content. Tools introduced include pixel based image manipulation
tools (such as Photoshop), video and animation compositing tools (such
as Nuke), 3D CGI tools (such as Maya) and immersive 3d interactive
engines (such as Unity).
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

VRIM 110 Digital Imaging for VR/AR Media 3.0 Credits
Students learn foundational image acquisition, lighting and processing
techniques and principles utilized for creating Immersive Media including
Virtual Reality (VR) and Augmented Reality (AR) content. Topics covered
include digital still and video imaging and lighting fundamentals and image
processing.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: ANIM 100 [Min Grade: D] or DIGM 100 [Min Grade: D] or
VRIM 100 [Min Grade: D] or PHTO 141 [Min Grade: D] or VSCM 200 [Min
Grade: D] or FMVD 110 [Min Grade: D] or VSST 104 [Min Grade: D]

VRIM 120 VR/AR Production Lab I 3.0 Credits
Students learn to integrate principles of color, design, story telling, three
dimensional layout, and a users' sense of presence within Immersive
Media by working in small teams to iterate through a number of design
and production projects, producing a variety of prototype immersive
experiences using readily available components and assets.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VRIM 110 [Min Grade: D]

VRIM 215 History of Immersive Media 3.0 Credits
Students learn the pre-cursors to modern Immersive Media forms and
the evolution of the art spanning centuries of aesthetic, social and
technological development. Concepts in 2D, 3D, VR, AR, Fulldome and
other forms of Immersive Media will be covered.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

VRIM 220 VR/AR Production Lab II 3.0 Credits
Students learn to integrate principles of color, design, story telling, three
dimensional layout, and a users' sense of presence within Immersive
Media by working in small teams to iterate through a number of design
and production projects, producing a variety of prototype immersive
experiences by implementing their own custom created assets.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VRIM 120 [Min Grade: D]

VRIM 250 Professional Practices for Immersive Media 3.0 Credits
Provides a professional orientation to the Immersive Media industry
through an exploration of a variety of projects and studies. In addition to
lecture and discussions, students learn to take active part in role plays
and presentations to achieve an understanding of the importance of team
building, team work, and team management in all phases of animation
and visual effects productions from proposals to final delivery, as well
as personal development and promotion through personal learning,
development of work demonstration materials.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VRIM 120 [Min Grade: D]

VRIM 310 Immersive Media Workshop I 3.0 Credits
This course examines the roles of the executive producer and the
development team in taking an Immersive Media project from concept to
design document through prototype while maintaining close connection to
story and communication. Students will work in small teams to research
and plan a production effort that results in a pre-production prototype.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VRIM 220 [Min Grade: D] and ANIM 212 [Min Grade: D]

VRIM 320 Immersive Media Workshop II 3.0 Credits
This course provides an environment in which the pre-production of
VRIM 310 Immersive Media Workshop I can be taken through a full
production effort. Students work in small teams to bring a selected
prototype to completion.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: VRIM 310 [Min Grade: D]

VRIM I199 Independent Study in Immersive Media 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation
with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

VRIM I299 Independent Study in Immersive Media 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

VRIM I399 Independent Study in Immersive Media 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

VRIM I499 Independent Study in Immersive Media 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

VRIM T180 Special Topics in Immersive Media 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

VRIM T280 Special Topics in Immersive Media 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

VRIM T380 Special Topics in Immersive Media 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

VRIM T480 Special Topics in Immersive Media 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

WEST Studies

Courses

WEST 100 Introduction to Digital Design Tools 3.0 Credits
This introductory level course will provide the technical background for creative and professional digital communication on several platforms. Students will examine basic elements of design through the use of print and web based programs including Illustrator, Photoshop, InDesign, Acrobat, Powerpoint, Word Press and Constant Contact. Students will explore the current potentials, limitations, and issues related to the use of computer software for design application.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

WEST 105 Deciding Design & Media 3.0 Credits
This course concentrates on the observation and exlploration of majors in Media Arts & Design as explored in the class offerings at Westphal College. Students will record personal observations and will use reflective writing to develop more informed impressions of disciplines.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

WEST 107 Maker Workshop 3.0 Credits
This course is an introduction to making, the composing and decomposing of physical artifacts and digital technologies to suit a variety of purposes – from practical to whimsical. Students will learn to take things apart, explore tools and materials, and build wondrous, wild art that's part science and part technology.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

WEST 210 Innovative Problem Solving 4.0 Credits
A seminar course that examines different methods of problem solving and its role across disciplines. The intention is to give the student a basis with which interdisciplinary projects can be approached in an innovative way and problem solving can be examined from multiple viewpoints.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

WEST 220 Multimodal Research 4.0 Credits
This course will develop student's critical thinking skills through examining research and information gathering models. The topics around which students will gather, analyze and synthesize information include: Systems and the Environment, Community Interaction, Technology and Problem Solving.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit

WEST 310 Active Learning and Exploration 4.0 Credits
Provides faculty guidance to enable students to identify and investigate an aspect of an interdisciplinary problem that they have identified. May include establishment of philosophical base, data collection, study of comparable or similar problems, writing of a project program, and preliminary project development. Includes interdisciplinary panel presentation.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: WEST 210 [Min Grade: D] and WEST 220 [Min Grade: C]

WEST 320 Active Engagement Projects 4.0 Credits
Students will explore, with faculty guidance an interdisciplinary problem solving based project that will be related to an area of interest and broader goals that they have identified as part of WEST 310 Active Learning and Exploration. The students will thoroughly explore the subject and execute the project through a variety of media and platforms.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Prerequisites: WEST 315 [Min Grade: C]

WEST 399 Independent Study Westphal 0.5-12.0 Credits
Provides individualized study in an area related to a major within the Antoinette Westphal College of Media Arts & Design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 7 times for 21 credits

WEST 465 Special Topics in Media, Arts and Design 0.5-12.0 Credits
Interdisciplinary course involving topics that cross department boundaries in the College of Media Arts & Design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 7 times for 21 credits

WEST I199 Independent Study in WEST 0.0-12.0 Credits
Provides individualized study in an area related to a major within the Antoinette Westphal College of Media Arts & Design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

WEST I299 Independent Study in WEST 0.0-12.0 Credits
Provides individualized study in an area related to a major within the Antoinette Westphal College of Media Arts & Design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

WEST I399 Independent Study in WEST 0.5-12.0 Credits
Provides individualized study in an area related to a major within the Antoinette Westphal College of Media Arts & Design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 7 times for 21 credits

WEST I499 Independent Study in WEST 0.0-12.0 Credits
Provides individualized study in an area related to a major within the Antoinette Westphal College of Media Arts & Design.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

WEST T180 Special Topics in WEST Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

WEST T280 Special Topics in WEST Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

WEST T380 Special Topics in WEST Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

WEST T480 Special Topics in WEST Studies 0.5-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 7 times for 21 credits

Web & Motion Graphic Design

Courses

WMGD 210 Motion Graphics I 4.0 Credits
This course explores fundamentals of graphics in motion, focusing on the use of word and image for television and web.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is GRDS.
Prerequisites: VSCM 230 [Min Grade: D] and VSCM 240 [Min Grade: D]

WMGD 220 Web Graphics I 4.0 Credits
This course focuses on the concepts, issues and techniques related to the design of Websites. Emphasis is on the design and hierachy of a website. Students will utilize HTML, XHTML, basic JavaScript, dynamic HTML, and Cascading Style Sheets (CSS) skills.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is DIGM or major is GRDS.

WMGD 330 Web Graphics II 4.0 Credits
Continues WMGD 220. Increases the complexity and scope of the art direction and design for web graphics. Students will focus on professional quality web pages using dedicated software that adheres to current industry standards.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is DIGM or major is GRDS.
Prerequisites: WMGD 220 [Min Grade: D]

WMGD 421 Motion Graphics II 4.0 Credits
This course focuses on applying aesthetics and skills learned in the first level to real-world applications that emphasize the graphics design of moving images.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is GRDS.
Prerequisites: WMGD 210 [Min Grade: D]

WMGD I199 Independent Study in WMGD 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

WMGD I299 Independent Study in WMGD 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

WMGD I399 Independent Study in WMGD 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

WMGD I499 Independent Study in WMGD 0.0-12.0 Credits
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

WMGD T180 Special Topics in Web & Motion Graphic Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

WMGD T280 Special Topics in Web & Motion Graphic Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

WMGD T380 Special Topics in Web & Motion Graphic Design 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated multiple times for credit

WMGD T480 Special Topics in Web & Motion Graphic Design 3.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: Antoinette Westphal College of Media Arts Design
Repeat Status: Can be repeated 3 times for 12 credits

Women's and Gender Studies

Courses

WGST 101 Introduction to Women's and Gender Studies 3.0 Credits
Women's and Gender Studies is a field that takes as its themes the study of women and gender, utilizing multi-disciplinary approaches from fields such as history, psychology, philosophy, and sociology. WGST 101 approaches the topics experientially and allows students to explore their own gender and sexuality as living identities.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

WGST 201 Introduction to Feminisms 3.0 Credits
Feminisms are movements to understand and critique gender relations and gender oppression, and also attempts to construct positive visions of human freedom and ethical action in an unjust world. This course is an introduction to the history of feminisms. The major movements that make up feminism in the modern era, in both the U.S. and abroad, will be examined.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

WGST 220 Writing on the Body 3.0 Credits
A study of the female body, since the publication of "Our Bodies Ourselves" to the present, dealing with such themes as the body as sexual object or reproductive womb, the body as social construct and the tyranny of the look, and related issues in politics, violence, sexism, fashion, peer-pressure, illness, age, etc.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

WGST 225 Women & Human Rights Worldwide 3.0 Credits
Women's human rights emerged in the 1980 as a special area, distinct from existing human rights norms. They are intended to better defend women's rights throughout the world. This class will consider women's human rights in a global context, looking at all parts of the world. We will examine women's rights around various topics such as health, social position, exile, war, censorship, childhood, and work. Academic literature, fiction, and film will all contribute to an understanding of the topic.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

WGST 230 Arab Women Writers 3.0 Credits
From Maghrebian Algeria and Morocco to Middle Eastern Egypt and Iraq and Lebanon, Arab women writers depict life in their countries or an unnamed desert state, from the 1940's to the Iraq War, raising critical questions about society, politics, economics and woman's place in doing so.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

WGST 235 African Francophone Women Writers: Displacement. From One Continent To Another 3.0 Credits
An introduction to the writing of some Francophone women writers from West and Sub-Saharan Africa. With each writer, the status, roles and challenges of women in their respective countries and societies will be examined.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

WGST 240 Women and Society in a Global Context 3.0 Credits
Studies women in a global society with one major area covered during each offering. Offered each year to accommodate one major world area.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 2 times for 9 credits
Restrictions: Cannot enroll if classification is Freshman

WGST 255 Gender and Black Popular Culture 3.0 Credits
This course critically examines the media's role in the social construction of "Blackness." Paying particular attention to images of race, culture and gender, this course examines representations of Black women and men in "popular culture" (film, television, music, advertising, etc.).
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

WGST 260 Gender and Judaism 3.0 Credits
An exploration of gender in Jewish religion and tradition. How has Judaism historically understood gender? Is Judaism a traditional or progressive religion where gender is concerned? What is the future of gender in Judaism?.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

WGST 265 Sexuality and Dictatorship 3.0 Credits
The class studies two different dictatorship governments in South America in the twentieth century: Chile and Uruguay through their victims' literary production. Male and female writers reacted differently towards these totalitarian systems. Female writers, especially Uruguayan, explored their sexuality in their writings to rebel against these dictatorships.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

WGST 270 Cigarettes and High Heels 3.0 Credits
The class introduces students to basic notions of semiotics that help to understand how humans create meanings according to a complex interplay of conventions of which we are normally unaware. The class explores the interpretations of two common social practices in modern societies: smoking and wearing high heels. It mainly concentrates on Spanish speaking societies in the Western hemisphere.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

WGST 275 Women's Health and Human Rights 3.0 Credits
This course explores the relationships between women's health and human rights under political and socially constructed influences. Health and well being are intricately associated with fundamental rights. We will conduct a comprehensive overview of women's health by engaging in lectures, class discussions, readings, journaling, group work, interviews and in-class activities.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

WGST 301 Sex, Gender, Feminism: A Seminar in Feminist Theories 3.0 Credits
What does it mean to call oneself a feminist in the twenty-first century? This class explores the history of feminism from the perspective of sex and gender. In it, students ask and answer the question, "What kind of feminist am I?".
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

WGST 308 Queer Theory 3.0 Credits
In an attempt to theorize the meaning of "queer" (and, in turn, its counterparts - "normal" and "straight") and to articulate what "queer theory" is/does, this course will examine major attempts to challenge the concept of "normal" and explicate the meaning and use of the concept "queer".
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman

WGST 320 Masculinities 3.0 Credits
An exploration of how masculinity is lived its multiple forms, traditional and alternative, in contemporary Western society. This course aims to arrive at a theory of masculinity – what does it mean to be "masculine"?.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

WGST 324 Retail Intersections: Social & Cultural Issues 3.0 Credits
Those who participate in the business of fashion such as retailers, merchants, designers, manufacturers and stylists must evolve in order to sell to customers. Throughout their lives, students are exposed to retailing, merchandising, buying, design, sales, branding, promotions, manufacturing and other such fields. For those interested in the study of retailing, fashion and merchandising, it is essential to understand landmark research and theoretical concepts behind the influences of this field and how social change, innovations and with the evolution of a multicultural marketplace, shifts have occurred over generations, and into the 21st century. This conceptual and theoretical course will expose students to a diverse range of clients and consumers.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

WGST I199 Independent Study in Women's and Gender Studies 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

WGST I299 Independent Study in Women's and Gender Studies 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

WGST I399 Independent Study in Women's and Gender Studies 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

WGST I499 Independent Study in Women's and Gender Studies 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

WGST T180 Special Topics in Women's and Gender Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

WGST T280 Special Topics in Women's and Gender Studies 1.0-6.0 Credit
Gives students an opportunity to apply the interdisciplinary methodology of women's studies to a focused topic. Topics to be announced. May be repeated for credit.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 24 credits

WGST T380 Special Topics in Women's and Gender Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

WGST T480 Special Topics in Women's and Gender Studies 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Writing

Courses

WRIT 195 Threshold Concepts in Writing 3.0 Credits
This course introduces students to threshold concepts in writing studies. Threshold concepts are "concepts critical for continued learning and participation in an area or within a community of practice" (Adler-Kassner and Wardle 2). In this course, we will explore how threshold concepts in writing studies provide insight into writing and writing process, using them to analyze texts and our own experiences as writers.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit

WRIT 200 Language Puzzles and Word Games: Issues in Modern Grammar 3.0 Credits
In this course, we will investigate how grammar is presented, debated, and viewed in our culture. While you will learn about grammar along the way, this is not a hard-core course about learning grammatical correctness. Rather, we will examine the consequences of grammar in how we think about language and, thus, how we think about one another.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D]

WRIT 210 [WI] The Peer Reader in Context 3.0 Credits
This course focuses on reading and writing practices. Students engage in autobiographical explorations and examine writing center theory and practice. After successful completion, students may apply to become a Drexel Writing Center Peer Reader.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: (ENGL 101 [Min Grade: C] and ENGL 102 [Min Grade: C])

WRIT 211 Advanced Composition 3.0 Credits
This course exposes students to theories and practices that shape how we think about composition. Students will have the opportunity to research topics related to their own writing experiences and interests, particularly in terms of disciplines in which they participate or are interested.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D]

WRIT 212 Argument and Rhetoric 3.0 Credits
In this course we will examine foundations of argument: what we find persuasive, and what strategies help us to best generate arguments, expand our understanding of the issues, and support our goals. We will also look at how some of the staples of argument – stories, comparisons, generalizations, and statistics – may help us make a point but can also lead us astray. We will explore these topics through your own work as you write about contemporary issues that matter to you as students.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D]

WRIT 215 [WI] Story Medicine 3.0 Credits
Students go to Children's Hospital of Philadelphia (CHOP) to perform in the Ryan Seacrest T.V. studio. Students host, write scripts and lead imagination activities for patients. Students will also write fiction. Subjects covered include: character, plot, setting, and sensory writing. All exercises are suitable for beginning and intermediate fiction writers.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] (Can be taken Concurrently)ENGL 101 [Min Grade: D] and ENGL 102 [Min Grade: D]

WRIT 220 [WI] Creative Nonfiction Writing 3.0 Credits
A writing workshop in which students will read and write nonfiction; emphasis is placed on experimenting with different forms such as the personal essay, literary journalism, nature writing, science writing and editing, and preparing manuscripts for publication. This is a writing-intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

WRIT 225 [WI] Creative Writing 3.0 Credits
A workshop course in composing imaginative forms of personal expression, including poems, short stories, and personal essays. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

WRIT 226 Writing in Public Spaces 3.0 Credits
This introductory-level creative writing course asks students to write descriptively about objects in museums and public spaces around the city. The class meets mostly in public spaces. The last two classes will be held on campus to workshop the short stories we will produce over the term.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 1 times for 6 credits
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D]

WRIT 250 "Mistakes Were Made": Truth, Writing, and Responsibility 3.0 Credits
Examines ways that writing—and writers—can represent and misrepresent through exploration of topics such as metaphor, representation of facts and events in nonfiction writing, and even use (and misuse) of the verb to be.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D]

WRIT 295 Forms Seminar 3.0 Credits
Introduces students to concepts and terminology that allows them to describe formal qualities of creative texts. Supports creative writers by helping them consider how formal features contribute to the meaning or effect of a text, as well as how to communicate about this to other writers (in order to help enhance workshop and collaborative writing situations). This variable topics course may focus on fiction/prose writing, poetry, or sentence-level style.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 2 times for 9 credits
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D]

WRIT 301 [WI] Writing Poetry 3.0 Credits
A writing workshop in which students will read and write poetry; emphasis is placed on experimenting with different forms of poetry, editing, and manuscript preparations for publication. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: A]

WRIT 302 [WI] Writing Fiction 3.0 Credits
A creative writing workshop course focusing on fiction. Students read and write short stories. Students develop skills by creating complete fictional works and critiquing the work of other students. Emphasis placed on narrative structure, prose style, pacing, voice and tone, appropriate material, character, plot, description, dialogue, and editing.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: D]

WRIT 303 Writing Humor and Comedy 3.0 Credits
A creative writing course focusing on humor and comedy. Students read and write satire, essays, social commentary and special forms. Students develop skills by creating complete works and critiquing the work of other students. Emphasis is placed on writing for specific audiences, narrative structure, prose style and editing.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: A]

WRIT 305 Life is Beautiful 3.0 Credits
This community partnership course links memoir with life, story-telling, and dying. Specifically, the course partners students with local hospice patients to co-create a life-story for the patient and his or her family. Students learn interviewing, listening, and writing techniques as well as skills in analysis and presentation. Additionally, the course facilitates interactions with the community and helps students to see themselves as linked to a community outside of college.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 12 credits

WRIT 306 Writing About the Media 4.0 Credits
This course teaches students how to write about media events and artifacts (books, movies, theatre, music, etc.), both as individual works and in a larger cultural context. It also teaches them about the kinds of media outlets which publish reviews and the style of writing these outlets favor.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: (ENGL 101 [Min Grade: D] and ENGL 102 [Min Grade: D] and ENGL 103 [Min Grade: D]) or ENGL 105 [Min Grade: D]

WRIT 310 Literary Editing & Publication 3.0 Credits
A course focusing on the techniques of editing, copyediting, proofreading, graphic selection and placement, the development of qualitative standards in manuscript selection for literary texts as well as connecting useful editorial/publication practice and social concerns in the fields of literary production.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: A]

WRIT 311 Writing and Reading the Memoir 3.0 Credits
Students will explore the problems and thrills of self-representation and self-expression through memoir. Deconstructing the work of other memoirists will show students how to develop themselves as flawed, yet likable protagonists. By the end of the course, students will be able to effectively analyze the elements of successful memoir, demonstrate an understanding of narrative theory, memory, and changing conceptions of "the self," and articulate and implement these skills through analysis of literary texts and in construction of their own creative works.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Prerequisites: ENGL 101 [Min Grade: C] and ENGL 102 [Min Grade: C] and ENGL 103 [Min Grade: C]

WRIT 312 [WI] Writing for Target Audiences 3.0 Credits
This course is structured as a writing workshop in which students will read and write in various rhetorical modes; emphasis is placed on experimenting with different forms such as review, proposal,and feature article writing as well as how to target various publications and therefore, various audiences. Students will read, discuss, and deconstruct published examples of many rhetorical modes, then write their own. Students will develop interview, review, research and persuasive writing skills.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

WRIT 315 Writing for Social Change 3.0 Credits
Guides students through a sequence of writing situations and activities central to writing for purposes of social change. Focusing on a current social issues, students will identify and define an issue, write to persuade the public and call for action, and attempt to gather support to address the issue.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 1 times for 6 credits
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D]

WRIT 400 [WI] Writing in Cyberspace 4.0 Credits
Students explore the world of cyberspace, learning about cyberpunk, hyperfiction and the literary theory related to them, operating in a MOO, and developing a website for a specific audience. Students consider these online environments critically and reflect on their significance. No previous computer experience required.
College/Department: College of Arts and Sciences
Repeat Status: Not repeatable for credit
Restrictions: Cannot enroll if classification is Freshman or Sophomore

WRIT 401 Advanced Poetry Workshop 3.0 Credits
Advanced Poetry Workshop will focus on continuing to develop students' poetry writing, editing, and criticism skills introduced in WRIT 225 (Creative Writing) and/or WRIT 301 (Poetry Writing). This class will concentrate on the art and skill of workshopping one another's poems as well as using the critiques gained in workshops to revise and improve one's poems.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 1 times for 6 credits
Prerequisites: WRIT 295 [Min Grade: C] and WRIT 301 [Min Grade: C]

WRIT 402 Advanced Fiction Writing 3.0 Credits
The Advanced Fiction Workshop allows students to continue to develop as a fiction writer, building on writing, editing, and response skills introduced in WRIT 225 Creative Writing, WRIT 302 Writing Fiction, and other writing experiences.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 1 times for 6 credits
Prerequisites: WRIT 295 [Min Grade: C] and WRIT 302 [Min Grade: C]

WRIT 405 Internship in Publishing 3.0 Credits
Internship in Publishing offers students practical experience in the publishing industry through the Drexel Publishing Group. Students work on The 33rd, (an academic journal); 5027mac.org (an online news and culture blog); and Painted Bride Quarterly (a literary magazine).
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 12 credits
Prerequisites: ENGL 103 [Min Grade: D] or ENGL 113 [Min Grade: D] or ENGL 105 [Min Grade: A]

WRIT I199 Independent Study in WRIT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

WRIT I299 Independent Study in WRIT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

WRIT I399 Independent Study in WRIT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

WRIT I499 Independent Study in WRIT 0.0-12.0 Credits
Self-directed within the area of study requiring intermittent consultation with a designated instructor.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

WRIT T180 Special Topics in Writing 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

WRIT T280 Special Topics in Writing 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

WRIT T380 Special Topics in Writing 3.0 Credits
A variable topics course in writing in which students will read and write in different genres, according to the specific topic (i.e., Writing Fiction; Joking, Comedy and Laughter: Memoir and Autobiography: Nature Writing); emphasis is places on editing and manuscript preparation for publication. This is a writing intensive course.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated 3 times for 9 credits
Restrictions: Cannot enroll if classification is Freshman or Sophomore

WRIT T480 Special Topics in Writing 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: College of Arts and Sciences
Repeat Status: Can be repeated multiple times for credit

Semester

- Graduate (http://catalog.drexel.edu/coursedescriptions/semester/grad/)
- Undergraduate (p. 1152)

Undergraduate

College of Medicine (MS)

Emergency Medicine (EMMD) (p. 1152)
Family Medicine (FAMD) (p. 1152)
Medicine (MEDI) (p. 1153)
Neurology (NEUL) (p. 1153)
Obstetrics & Gynecology (OBGY) (p. 1153)
Office of Medical Education (OMED) (p. 1153)
Orthopedics (ORTH) (p. 1153)
Otolaryngology (OTOL) (p. 1153)
Pathology (PATH) (p. 1153)
Pediatrics (PEDS) (p. 1153)
Pre-Medical (PMED) (p. 1154)
Psychiatry (PSYC) (p. 1155)
Surgery (SURG) (p. 1155)

COM School of Biomedical Sciences & Professional Studies (QQ)

Biochemistry (BIOC) (p. 1152)
Medical Science Preparatory (MSPP) (p. 1152)
Pre-Medical (PMED) (p. 1154)

Biochemistry

Courses

BIOC 400S Biochemistry 4.0 Credits
Biochemistry is the essential basis for understanding metabolic and disease processes at the biochemical and molecular levels. Because of its importance as a foundation to medicine, biochemistry is going to be a major focus of the MCAT, beginning with the test in the summer of 2015. The course, which will be taught at Drexel University College of Medicine, by College of Medicine faculty, will cover the topics in general biochemistry, with a particular focus on those topics that are to be included on the new MCAT.
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit

BIOC T480S Special Topics in Biochemistry 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Can be repeated multiple times for credit

Emergency Medicine

Courses

EMMD S124S Advance Emergency Medicine 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

Family Medicine

Courses

FAMD S224S REPRODUCTIVE HEALTH 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

FAMD S244S REPRODUCTIVE HEALTH 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

FAMD S444S Environmental & Occup Hlth 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

Medical Science Preparatory

Courses

MSPP 400S Advanced Topics in Chemistry I 4.0 Credits
This review course in general and organic chemistry will contain a review of chemical calculations and theory in topics such as stoichiometry, gas laws, thermodynamics, electrochemistry, equilibria, and pH. Atomic theory and bonding will also be reviewed. The semester ends with a discussion of the stereochemistry of organic molecules.
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit

MSPP 401S Advanced Topics in Chemistry II 4.0 Credits
This review course in organic chemistry will investigate reaction mechanisms, spectroscopy, qualitative organic chemistry, and laboratory techniques.
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit

MSPP 402S Advanced Topics in Physics I 4.0 Credits
This course covers classical physics as applied to the kinematics and dynamics of static and of moving bodies.
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit

MSPP 403S Advanced Topics in Physics II 4.0 Credits
This course covers classical physics as applied to: fluids, vibrations, waves,electricity, magnetism and optics.
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit

MSPP 404S Concepts in Science and Verbal Reasoning I 6.0 Credits
This is a didactic course with weekly preparations for the Verbal Reasoning and Writing, Physical Sciences and Biological Sciences of the Medical College Admissions Test. Incorporated into the course are approximately six mock MCAT exams for practice.
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit

MSPP 405S Concepts in Science and Verbal Reasoning II 6.0 Credits
This is a didactic course with weekly preparations for the Verbal Reasoning and Writing, Physical Sciences and Biological Sciences of the Medical College Admissions Test. Incorporated into the course are approximately six mock MCAT exams for practice.
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit

MSPP T480S Special Topics in Medical Science Preparatory 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Can be repeated multiple times for credit

Medicine

Courses

MEDI S124S INPATIENT MEDICINE 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

MEDI S342S MEDICAL ONCOLOGY - 2 WKS (S/U) 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

MEDI S492S CARDIOLOGY TEACHING LAB-HARVEY 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

Neurology

Courses

NEUL S132S NEUROLOGY ELECTIVE-2WKS 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

Obstetrics & Gynecology

Courses

OBGY S154S High Risk Obstetrics 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

Office of Medical Education

Courses

OMED S112S Strategic& Finanical Mgmt 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

Orthopedics

Courses

ORTH S134S Adult Orthopaedics 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

ORTH S192S Orthopaedic Trauma*** 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

ORTH S242S Orothpedics: Spine Surgery*** 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

Otolaryngology

Courses

OTOL S114S Adult&Pediatric Otolaryngology 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

OTOL S124S Otorhinolaryngology 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

Pathology

Courses

PATH S184S PEDIATRIC PATHOLOGY 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

Pediatrics

Courses

PEDS S204S Pediatric Rehabilitation 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

PEDS S492S PEDIATRIC NEUROSURGERY 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

Pre-Medical

Courses

PMED 111S General Chemistry I 3.0 Credits
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PMED.

PMED 112S General Chemistry I Lab 1.0 Credit
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PMED.

PMED 114S CONCEPTS IN CHEMISTRY I 4.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PMED.

PMED 121S General Physics I 3.0 Credits
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PMED.

PMED 122S General Physics I Lab 1.0 Credit
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PMED.

PMED 131S General Chemistry II 3.0 Credits
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit

PMED 132S General Chemistry II Lab 1.0 Credit
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PMED.

PMED 141S General Physics II 3.0 Credits
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit

PMED 142S General Physics II Lab 1.0 Credit
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit

PMED 151S College Algebra & Trigonometry 3.0 Credits
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PMED.

PMED 211S General Biology I 3.0 Credits
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PMED.

PMED 212S General Biology I Lab 1.0 Credit
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PMED.

PMED 221S Organic Chemistry I 3.0 Credits
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PMED.

PMED 222S Organic Chemistry I Lab 1.0 Credit
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PMED.

PMED 231S General Biology II 3.0 Credits
This course is the second semester of the PMED general biology series. This course delves into the concepts of genetics, inheritance, evolution, and biodiversity. Specifically, we will learn about the molecular basis of inheritance, how genes encode proteins, the principles of genetics, and some of the techniques used to study molecular biology. We will then study the principles of evolution and biodiversity. Additionally, plants, photosynthesis and vertebrate evolution will also be explored.
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PMED.

PMED 232S General Biology II Lab 1.0 Credit
This course will introduce students to important concepts and laboratory techniques commonly used immunology, molecular biology and genetics. It will also allow students to further develop their skills in formulating hypotheses, experimental design, proper lab technique, and collecting and analyzing data. An additional goal is to continue to develop and refine the student's scientific writing skills. The emphasis in this course will be on active learning through the participation of all group members in each of the laboratory projects.
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PMED.

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PMED 240S Conceptual Reviews in General and Organic Chemistry 3.0 Credits
The intention of the course shall be to serve as a course concentrating on select topics in general chemistry and organic chemistry as required for the current MCAT requirements. The instruction shall be covered by the instructor along with input by a TA(s) to bridge the gap between biology, physics and chemistry. In this way, the students leave with a more holistic view of the concepts to be discussed with breadth and depth, and how these different disciplines come together to explain observations. Where possible case studies shall be used to apply the concepts taught to put them into application.
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit
Prerequisites: PMED 111S [Min Grade: C] and PMED 112S [Min Grade: C] and PMED 131S [Min Grade: C] and PMED 132S [Min Grade: C] and PMED 221S [Min Grade: C] and PMED 222S [Min Grade: C] and PMED 241S [Min Grade: C] and PMED 242S [Min Grade: C]

PMED 241S Organic Chemistry II 3.0 Credits
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PMED.

PMED 242S Organic Chemistry II Lab 1.0 Credit
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit
Restrictions: Can enroll if major is PMED.

PMED 250S Molecular Biology & Biochemistry 3.0 Credits
This course will provide an introduction to the principles of biochemistry that will give the student a command of its concepts and language. Major themes will include foundations of biochemistry, structure and catalysis, bioenergetics and metabolism, and information pathways.
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Not repeatable for credit

PMED T180S Special Topics in Pre-Medical 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Can be repeated multiple times for credit

PMED T280S Special Topics in Pre-Medical 0.0-12.0 Credits
Topics decided upon by faculty will vary within the area of study.
College/Department: COM School of Biomedical Sciences Professional Studies
Repeat Status: Can be repeated multiple times for credit

Psychiatry

Courses

PSYC S242S Geropsychiatry - 2wks 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

Surgery

Courses

SURG S114S Surgical Endocrinology/Oncology 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit

SURG S204S GROSS SURGERY SERVICE 0.0 Credits
College/Department: College of Medicine
Repeat Status: Not repeatable for credit