



DREXEL UNIVERSITY
College of
Arts and Sciences

CATALOG

2014-2015

UNDERGRADUATE & GRADUATE



catalog.drexel.edu

College of Arts & 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

The College of Arts and Sciences (<http://drexel.edu/coas>) was established in 1990. The educational objectives encompass a wide range of goals: to provide interdisciplinary study in the arts and sciences for our Bachelor of Science and Bachelor of Arts majors; to offer Master of Science and Doctoral programs in selected areas of faculty and research strength; to promote research, scholarship, and creative activities which expand disciplinary boundaries and enhance faculty expertise and the quality of the University's instruction; to provide general educational courses for the University's undergraduates; and to improve the quality of life for the University's community through co-curricular programming in the arts and sciences.

Each major combines interdisciplinary study with hands-on, experiential learning to prepare students for a variety of careers, as well as graduate or professional school. All undergraduate majors in the College offer co-operative education program options, with special opportunities relating academic study to work experience, or internships. Additionally, students across the College are encouraged to work alongside faculty in research projects that relate to their academic and professional goals.

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About the Curriculum

The College of Arts and Sciences is committed to providing high-quality education in the humanities, social sciences and sciences.

Bachelor of Arts Degree Programs

The Bachelor of Arts degree provides a broad-based liberal education while allowing students the option to apply their studies through Drexel's well-established co-operative education program.

The BA degree continues the Drexel focus on critical reasoning, a strong grounding in arts and sciences, and effective development of communication skills. The degree is intended to provide a solid liberal arts background for graduate study as well as for professional degrees in such areas as law, public policy, international relations, education, psychology, social work, public health, and medicine.

While the BA degree requires more liberal arts courses than the Bachelor of Science degree, it also allows more varied choices in the fulfillment of math and science requirements and requires study of a foreign language. The BA degree prepares students for an ever-changing and culturally diverse world, and provides them with the tools needed to be leaders in industry, arts, government, and human services.

Bachelor of Science Degree Programs

The College offers Bachelor of Science degrees in many of its majors. The BS degree is similar to the Bachelor of Arts degree, but requires more focused coursework in the sciences than the BA.

In several majors, both a BS and a BA are available. Both degrees provide the same foundation in the discipline. The BS is a more structured approach, while the BA allows for greater flexibility. Drexel's strong advising program helps students learn more about the degree options and which option matches each student's long-term goals.

Science and Mathematics Curriculum

All students in biology, environmental science, geoscience, chemistry, mathematics, and physics study similar subjects during the freshman year. This recognizes the fundamental knowledge common to those disciplines; it also allows for transfer between majors at the end of the freshman year without loss of time. Upper-class students in those disciplines are given the opportunity to take related electives in liberal, scientific, and technical fields.

The flexibility available in the elective programs, and the opportunity to complete an academic minor, permit students to prepare for continuing studies in graduate or professional school, for work in government or industry, or for a change in educational goals.

Generally the basic requirements in each major are completed prior to the senior year. Thus, for science and mathematics majors, the technical electives in the last year may be selected in some advanced specialty within the specific major, and free electives may be used for enrichment or to prepare for a change of field. Each student's elective program must be approved by an advisor from his or her major department.

Humanities and Social Science Curriculum

Students majoring in the humanities and social sciences complete similar sets of courses in the first two years. Some of these courses may be identical (the freshmen year English sequence) while others will vary by discipline, such as major-specific freshmen courses or the math and science requirements in the BA and BS options.

Students in the communication major will take at least one course in their proposed concentration of public relations, journalism, or technical communication in each term during the freshman year. More intensive

work in the concentration begins in the sophomore year, as do elective options.

All humanities and social science students have a significant degree of flexibility, allowing them to complete disciplinary requirements, and, through free electives, to take a minor or perhaps another major to prepare for entry into graduate or professional school.

Secondary and Elementary Teacher Certification

The School of Education offers innovative curricula that combine academic majors with appropriate coursework to satisfy state requirements for certification in English, and sciences—including biology, chemistry, earth and space sciences, physics—as well as mathematics and elementary education. Students interested in the teacher education programs should contact the School of Education (<http://www.drexel.edu/grad/programs/edu>).

Accelerated Degree Program

The Accelerated Degree Program in the College of Arts and Sciences provides opportunities for highly talented and strongly motivated students to complete both an undergraduate degree and a master's degree in five years. Students generally enroll in a five year co-op program and replace the third co-op with courses to complete the graduate degree requirements; some majors require that students enroll for the four-year one co-op program. Students may be offered preliminary admission to such a program when they start at Drexel or can apply when they have completed 90 credits. In both instances, admission to the dual program must be approved before students complete 120 credits.

Accelerated Preprofessional Degree

The College accepts highly qualified and motivated students into accelerated BS/BA +MD and BS/BA +JD degrees. Students must apply to be admitted into these programs before starting at Drexel. For more information, students should contact the Office of Undergraduate Admissions (<http://www.drexel.edu/undergrad>).

Preprofessional Programs

Students wishing to prepare for admission to professional schools of medicine, veterinary medicine, dentistry, or public health may obtain preprofessional counseling and application assistance at the Steinbright Career Development Center (<http://www.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.

Degree Requirements

Certification for graduation is provided by the individual department or program according to the requirements for each major, which are set forth in subsequent pages. The minimum number of credits required for the degrees of Bachelor of Arts and Bachelor of Science varies from one department and program to another but in no case does it exceed 192 credits of academic work with two to six terms of co-operative experience.

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/engphil/about/drexelwritingcenter/wicourses/course_list) on the Drexel University Writing Center (<http://drexel.edu/writingcenter>) 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.

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.

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 pre-MBA Global Business English program (GLOBE), English for academic purposes, TOEFL and IELTS preparation, and other subjects. Many graduate students begin their studies at Drexel in the English Language Center for a rigorous and supportive environment to develop or enhance their academic English language knowledge and skills. International teaching assistants are oriented through a summer course in the language, culture, and pedagogy of the U.S. classroom. Accepted graduate students have access to free oral communications courses, tutoring, and other academic skills workshops throughout the academic year.

Some graduate programs within the COAS may accept students who are academically admissible but need further English language study. 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

Minor in Africana Studies

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.

Required Courses

AFAS 101	Introduction to Africana Studies	3.0
AFAS 201	Cross Currents in Africana Studies	3.0
Select six of the following: *		18.0
AFAS 250	African American Herstories	
AFAS 260	Race, Politics and Religion	
AFAS 295	Special Topics in Africana Studies	
AFAS 298	Independent Study for Minors	
AFAS 301	Politics of Hip Hop	
AFAS 385	Rum, Rice and Revolution: Caribbean History	
AFAS 395	Special Topics in Africana Studies	
AFAS 401	Urban Social Justice Practicum I	
AFAS 402	Urban Social Justice Practicum II	
ANTH 101	Introduction to Cultural Diversity	
ANTH 310	Societies In Transition: The Impact of Modernization and the Third World	
ENGL 203 [WI]	Post-Colonial Literature I (WI)	
ENGL 204	Post-Colonial Literature II	
ENGL 325	Topics in World Literature **	
HIST 216	Freedom in America	
HIST 215	American Slavery	
MUSC 107	Jazz Ensembles	
MUSC 333	Afro-American Music USA	
PSCI 354	United States & the Third World	
PSCI 372	City in United States Political Development	
WMST 240	Women and Society in a Global Context	
WMST 280	Special Topics in Women's Studies ***	

Total Credits **24.0**

* Students take an additional 18.0 credits including-but not limited to the following courses. (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.

Minor in American Studies

American studies is an interdisciplinary approach to studying American life and culture. Drawing on the expertise and methodologies of a variety

of subjects, American studies offers students the opportunity to examine their world critically and understand their place in it. American studies is an ideal minor for students planning for graduate work or professional careers in business, engineering, and law because it grounds these practical fields in a strong humanistic tradition.

Required Courses

PSCI 110	American Government I *	4.0
Select one of the following:		3.0
HIST 201	United States History to 1815	
HIST 202	United States History, 1815-1900	
HIST 203	United States History since 1900	

Two US History courses

Some examples of US History courses include the following:		6.0
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 220	History of American Business	
HIST 222	History of Work & Workers in America	
HIST 223	Women and Work in America	
HIST 224	Women in American History	
HIST 234	The United States Civil War	

Two US Government or US Politics courses

Some examples of US Government or US Politics courses include the following:		6.0
PSCI 211	American Government II	
PSCI 220	Constitutional Law I	
PSCI 313	State & Local Government	
PSCI 330	Public Opinion & Propaganda	
PSCI 363	Constitutional Law II	
PSCI 364	Constitutional Law III	
PSCI 365	Politics, Law, & Justice	
PSCI 366	Supreme Court and American Politics	

Select two of the following:		6.0
ENGL 205	American Literature I [WI]	
ENGL 206	American Literature II [WI]	
MUSC 336	History of Jazz	
MUSC 338	American Popular Music [WI]	
SOC 210	Race and Ethnic Relations	
SOC 341	Environmental Movements in America	

Total Credits **25.0**

* Or, if a History or Political Science major, PSCI 110 may be substituted with a third course from the PSCI courses listed.

Anthropology

Bachelor of Arts: 182.0 quarter credits

About the Program

Students majoring in anthropology broaden their understanding of the diversity of cultures and ways of life in the global environment through theoretical courses, content area courses, and specialized courses in field techniques and methodology.

The anthropology major is a small, highly specialized program that provides students with an exceptional background in theory, methodology, and field experience for the workplace or graduate training.

Two options exist in the anthropology bachelor of arts degree program: 1) a four year non-co-op program; or 2) a four year program with a single six month co-op in the junior year. The majority of anthropology majors select the four year non-co-op option, but students who select to undertake a co-op are guided by interaction with faculty both inside and outside the classroom. The core of the major is the seminar in ethnography which majors are required to take each spring term for a total of 8.0 credits.

Additional Information

Dr. Wesley Shumar
Anthropology Department Head
Room 117, PSA Bldg #47
215-895-2060
shumarw@drexel.edu

Caroline Chmielewski
Department Administrator
Anthropology Department
Room 118, PSA Bldg #47
215-895-2455
chmielcm@drexel.edu

For more details about the Anthropology major, visit the Anthropology (<http://www.drexel.edu/culturecomm/academics/undergraduate/anthropology>) web site.

Degree Requirements

General Requirements

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
CIVC 101	Introduction to Civic Engagement	1.0
Two Mathematics Courses		6.0-8.0
Two Science Courses		6.0-8.0

Foreign Language Courses

A minimum of two consecutive language courses * 8.0

Humanities and Fine Arts

LING 102	Language and Society	3.0
COM 150	Mass Media and Society	3.0
Two Humanities and Fine Arts Courses		6.0

Social and Behavioral Sciences

ANTH 110	Human Past: Anthropology and Prehistoric Archeology	3.0
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ANTH 330	Media Anthropology	3.0
COM 355	Ethnography of Communication	3.0
SOC 101	Introduction to Sociology	3.0
International Studies		
ANTH 310	Societies In Transition: The Impact of Modernization and the Third World	3.0
International Studies Elective		3.0
Studies in Diversity		
ANTH 101	Introduction to Cultural Diversity	3.0
ANTH 215	Anthropology of Gender	3.0
Anthropology Requirements		
Community Research		
SOC 270	Theory of Applied and Community Sociology	3.0
ANTH 370	Ethnographic Methods	3.0
ANTH 390	Seminar in Ethnography (3-credit course taken 4 terms)	12.0
Methods Sequence		
COM 220	Qualitative Research Methods	3.0
SOC 250	Research Methods I	3.0
SOC 364	Computer-Assisted Data Analysis	3.0
Theory Sequence		
COM 210	Theory and Models of Communication	3.0
SOC 260 [WI]	Classical Social Theory (WI)	3.0
ANTH 410	Cultural Theory	3.0
Anthropology Program Requirements		
Select ten of the following:		30.0
ANTH 120	Biblical Archaeology: The Archaeology of Israel and Jordan	
ANTH 210	Worldview: Science, Religion and Magic [WI]	
ANTH 212	Topics in World Ethnography [WI]	
ANTH 220	Aging In Cross-Cultural Perspective	
ANTH 240	Urban Anthropology	
ANTH 255	Psychological Anthropology	
ANTH 312	Approaches to Intercultural Behavior	
ANTH 355	Anthropology of Cyberspace	
ANTH 360	Culture and the Environment	
ANTH 365	Family and Kinship	
ANTH 380	Special Topics in Anthropology	
COM 345	Intercultural Communication	
COM 360	International Communication	
SOC 125	Sociology of Aging	
SOC 210	Race and Ethnic Relations	
SOC 220	Wealth and Power	
SOC 335	Sociology of Education I	
Electives		
Free Electives		48.0
Total Credits		182.0-186.0

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* At least one foreign language course must be at the 200-level.

Sample Plan of Study

Term 1		Credits
ANTH 101	Introduction to Cultural Diversity	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
UNIV H101	The Drexel Experience	1.0
Math Elective		3.0-4.0
Foreign Language Course		4.0
Term Credits		14.0-15.0
Term 2		
ANTH 110	Human Past: Anthropology and Prehistoric Archeology	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
CIVC 101	Introduction to Civic Engagement	1.0
Math Elective		3.0-4.0
Foreign Language Course		4.0
Term Credits		14.0-15.0
Term 3		
ANTH 390	Seminar in Ethnography	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
SOC 101	Introduction to Sociology	3.0
SOC 260 [WI]	Classical Social Theory	3.0
SOC 270	Theory of Applied and Community Sociology	3.0
Term Credits		15.0
Term 4		
ANTH 215	Anthropology of Gender	3.0
COM 150	Mass Media and Society	3.0
COM 220	Qualitative Research Methods	3.0
Lab Science Elective		3.0
Humanities/Fine Arts Elective		3.0
Term Credits		15.0
Term 5		
ANTH 370	Ethnographic Methods	3.0
COM 210	Theory and Models of Communication	3.0
SOC 250	Research Methods I	3.0
Lab Science Elective		3.0
Humanities/Fine Arts Elective		3.0
Term Credits		15.0
Term 6		
ANTH 310	Societies In Transition: The Impact of Modernization and the Third World	3.0
ANTH 390	Seminar in Ethnography	3.0
LING 102	Language and Society	3.0
SOC 364	Computer-Assisted Data Analysis	3.0
Anthropology Program Requirement*		3.0
Term Credits		15.0
Term 7		
ANTH 330	Media Anthropology	3.0
Free Electives		12.0
Term Credits		15.0

Term 8		
ANTH 390	Seminar in Ethnography	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
	Free Elective	4.0
	Anthropology Program Requirements*	6.0
Term Credits		14.0
Term 9		
	Anthropology Program Requirements*	6.0
	Free Electives	10.0
Term Credits		16.0
Term 10		
ANTH 410	Cultural Theory	3.0
COM 355	Ethnography of Communication	3.0
	Anthropology Program Requirements*	6.0
	Free Electives	6.0
Term Credits		18.0
Term 11		
	Anthropology Program Requirements*	6.0
	Social and Behavioral Sciences Elective	3.0-4.0
	Free Electives	7.0
Term Credits		16.0-17.0
Term 12		
ANTH 390	Seminar in Ethnography	3.0
	Anthropology Program Requirement*	3.0
	Free Electives	9.0
Term Credits		15.0
Total Credit: 182.0-185.0		

* See degree requirements.

Co-op/Career Opportunities

CO-Op Opportunities

In order for majors to take the required seminar in ethnography, all anthropology co-ops are scheduled for the fall/winter cycle. Anthropology co-ops are student initiated and developed through discussions with faculty, rather than being selected from an existing list. Co-op ideas frequently emerge from discussions in the seminar in ethnography as students who have undertaken co-ops report on their experiences. Past co-ops have included: teaching English in Costa Rica; working on an archeological dig in the Yucatan; studying agricultural practices in Hawaii; working with an arts program in Oaxaca. In addition, several majors have collaborated on faculty research, while others have been engaged in community outreach projects.

Post-Graduate Opportunities

Many corporations, schools and health-care institutions are using ethnographic field techniques and qualitative methods in order to understand their markets and clientele, or for that matter, their own organizational structure. The Anthropology major prepares students for employment in these areas, as well as for further graduate work in anthropology, public policy, law and other social and behavioral sciences.

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

Minor in Anthropology

The anthropology minor provides students in other fields with a cross-cultural awareness that will enable them to interact with a variety of people in a wide range of situations. By giving students a respect for and understanding of the basis of cultural variation, the minor can facilitate working in international settings. Even for students working within the United States, anthropology offers increased sensitivity to ethnic and population diversity. Medicine, law, counseling, nursing, and nutrition are only a few of the fields in which clients and professionals may come from different parts of our heterogeneous society.

Please note: No more than three courses that are required for a student's major can count towards fulfilling requirements for the minor.

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	3.0
Select three of the following:		9.0
ANTH 215	Anthropology of Gender	
ANTH 330	Media Anthropology	
ANTH 120	Biblical Archaeology: The Archaeology of Israel and Jordan	
ANTH 212	Topics in World Ethnography [WI]	
ANTH 220	Aging In Cross-Cultural Perspective	
ANTH 240	Urban Anthropology	
ANTH 310	Societies In Transition: The Impact of Modernization and the Third World	
ANTH 312	Approaches to Intercultural Behavior	
ANTH 355	Anthropology of Cyberspace	
ANTH 360	Culture and the Environment	
ANTH 365	Family and Kinship	
ANTH 380	Special Topics in Anthropology	
Total Credits		24.0

Culture and Communication Faculty

Ronald Bishop, III, PhD (*Temple University*). 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*) *Coordinator of the Publication Management Program*. Instructor. Publishing, electronic publishing, publishing and communications, publishing and mass-media.

Robert J. Brulle, PhD (*George Washington University*). Professor. Environmental policy and politics, critical theory, marine risk, social movements, environmental sociology.

Karen Cristiano, PhD (*Temple University*). Associate Teaching Professor. Journalism, medical writing, feature writing, copy editing, mass media and society.

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

Daniela De Pau, PhD (*University of Illinois at Urbana-Champaign*). Assistant Teaching Professor. Italian cinema, relationship between literature, cinema and other arts, traveling literature, women writers, the tradition of the Comic and the tradition of the Fantastic, autobiography, politics of immigration, cultural identity in contemporary Italy.

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*). 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.

Paul Evangelista, PhD (*Temple University*). Assistant Teaching Professor. Public relations, communication theory, new technologies in communication (classroom and online); business communication.

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

Alexander Friedlander, PhD (*Carnegie Mellon University*) Associate Dean, *College of Arts and Sciences*. Associate Professor. Rhetorical theory and practice, document design, writing and technology.

Anthony Glascock, PhD (*University of Pittsburgh*) Coordinator of the *Anthropology Program*. Professor. Aging and health, definitions of functionality and impairment, technology and aging, social organization, Ireland, East Africa.

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

Julia Hall, PhD (*University of Pennsylvania*). Professor. Criminal justice and juvenile justice reform, including community based alternatives to incarceration, correctional education and programming, reentry and reintegration, restorative justice, and issues relating to special needs offenders, including the el

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

Barbara Hornum, PhD (*Bryn Mawr College*) Director of *Center for Academic Excellence (DCAE)*. Associate Professor. Comparative gerontology, planned communities, continuing care communities, retirement, faculty development.

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

Frank Kelley, PhD (*Temple University*). Associate Teaching Professor. Corporate university systems online, power structure of media enterprises, public relations, event planning.

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.

David Kutzik, PhD (*Temple University*) Coordinator of the *Sociology Program*. Professor. Sociology and philosophy of science; applied gerontological research; political economy of health care; microprocessor-based assistive technologies to improve case management and increase independent living among frail populations.

Brent Luvaas, PhD (*UCLA*). Assistant Professor. DIY and independent media production; transnational consumer culture; popular music; new media and mediated subjectivities; youth culture in the US and Indonesia.

Joanna Lyskovicz, MA (*UAM Poznan, Poland*). Instructor. Comparative linguistics, translation, business Spanish, medical Spanish, modern Spanish literature, XXth cent. Spanish poetry, magical realism in Latin American literature.

Diamantino Machado, PhD (*Temple University*). Teaching Professor. Globalization, political economy, political sociology, philosophy of social science, postmodernism and social reflection.

Maria delaluz Matus-Mendoza, PhD (*Temple University*). 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.

Jack Maxwell, MS (*Saint Joseph 's University*). Teaching Professor. Criminal investigations, policing, police administration, domestic violence.

Jordan McClain, PhD (*Temple University*). Assistant Teaching Professor. Media framing and music journalism; relationship between television and music; American popular culture; celebrity, consumerism, and consumer behavior; branding, brand positioning, and advertising criticism.

Margaret McClure, PhD (*University of California at Berkeley*). Assistant Teaching Professor. Research methods, sociology of the family, deviance, military sociology.

Usha Menon, PhD (*University of Chicago*). Associate 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.

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

Anne-Marie Obajtek-Kirkwood, PhD (*University of Pennsylvania*). Associate Professor. French and francophone 20th and 21st century literature, culture and film. Representations of the Occupation (WWII); war; minorities in France; autobiography; feminist issues.

Rakhmiel Peltz, PhD (*Columbia University, Linguistics; University of Pennsylvania, Biological Sciences*) Director of *Judaic Studies Program*. Professor. Sociolinguistics, ethnography of communication, social history

of Yiddish language and culture, Yiddish culture of Eastern Europe, language planning, language and ethnic identity, language and group memory, aging and ethnicity, history of urban neighbors.

Douglas V. Porpora, PhD (*Temple University*). Professor. International political economy, culture, social theory, and philosophy of social science.

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.

Devon Powers, PhD (*New York University*). Assistant Professor. Popular music, cultural intermediaries, promotional culture, 20th-century history, journalism studies.

Rachel R. Reynolds, PhD (*University of Illinois at Chicago*). Associate Professor. Sociolinguistics, ethnography of communication, intercultural communication, globalization and the rhetoric of community, political economy of immigration, race and ethnicity, new African immigrants in the United States, Igbo studies.

Cynthia Reed Rickards, MS (*St. Joseph's University*) *Criminal Justice Program*. Assistant Teaching Professor. On-line pedagogy; service-learning pedagogy; juvenile justice; domestic violence.

David Ridgway, MS (*St. Joseph's University*). Instructor. Deviant behaviors, social problems.

Rosemary Rys, MA (*Glassboro State College (now Rowan University)*). Instructor. Public relations and marketing.

Simone Schlichting-Artur, EdD (*University of Pennsylvania*) *Assistant Department Head, Culture and Communication*. 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.

Mimi Sheller, PhD (*New School for Social Research*) *Director of the Mobilities Research and Policy Center at Drexel University*. 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.

Natsumi Shor Assistant Teaching Professor. Business and professional Japanese; Japanese film and culture; interrelation between Japanese language to the nation's culture and thought.

Wesley Shumar, PhD (*Temple University*) *Department Head, Culture and Communication*. Professor. Ethnography of cyberspace, online learning communities, political economy of higher education, globalization, activity theory, semiotics, critical realism, psychoanalysis, identity and the self.

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.

Lawrence Souder, PhD (*Temple University*). Associate Teaching Professor. Science and technical writing, communication ethics.

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

Judith Storniolo, PhD (*University of Pennsylvania*). Teaching Professor. Historical and comparative linguistics, Mesoamerican languages and culture, applied anthropology, public policy, oral traditions and narratives, ideology and ritual, Mesoamerican ethnohistory; and pre-Columbian literature.

Asta Zelenkauskaitė, PhD (*Indiana University*). Assistant 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.

Interdepartmental Faculty

Tony H. Grubestic, PhD (*The Ohio State University*) *Director of the Center for Spatial Analytics and Geocomputation (CSAG)*. Professor. Geographic information science, spatial analysis, development, telecommunication policy, location modeling.

Michelle Sahl, PhD, MEd, MBA, MBE (*The University of the Sciences in Philadelphia*). Associate Teaching Professor. Health management and policy: management and leadership of health services organizations, urban health, and the history of health care systems.

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 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 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 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 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 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 like 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 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 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 through 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 Anthropology of Cyberspace 3.0 Credits

This course will focus on how the internet and new media have changed the way we think about space and time, 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 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 390 Seminar in Ethnography 3.0 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 12 credits

Restrictions: Can enroll if major is ANTH.

ANTH 410 Cultural Theory 3.0 Credits

Explores controversial issues and questions, such as sociobiology and what it means to be human, as they have been and are being studied by those concerned with human origins and development. Reviews major thinkers in the history and theory of anthropology, including modernists and postmodernists.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

ANTH 499 Directed Studies in Anthropology 12.0 Credits

Provides supervised study of special subjects in anthropology. See department for topics and terms offered.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Minor in Astrophysics

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, students cannot minor in both.

Admission requirements: Consultation with the Physics Department.

Required Prerequisite Courses

PHYS 113 & PHYS 114 & PHYS 115	Contemporary Physics I and Contemporary Physics II and Contemporary Physics III
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OR

PHYS 101 & PHYS 102 & PHYS 201	Fundamentals of Physics I and Fundamentals of Physics II and Fundamentals of Physics III
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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

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, bioscience, 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.

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
INFO 102	Introduction to Information Systems	3.0

Human/Computer Interface Design

CS 337	The Psychology of Human-Computer Interaction	3.0
INFO 110	Human-Computer Interaction I	3.0

Databases

CS 461	Database Systems	3.0
INFO 200	Systems Analysis I	3.0

INFO 210	Database Management Systems	3.0
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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

Biological Sciences

Bachelor of Science: 182.5 quarter credits

About the Program

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 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 most new developments of the new century. In the past two decades, advances in molecular biology and genetics have been rapid, opening many new, exciting career opportunities in the fields of biotechnology and genetic engineering. Biologists can pursue a variety of options including careers in medicine, dentistry, veterinary medicine or other health-related areas; in research or commercial laboratories; in various private and government agencies; and in teaching. In fact, more than 100 different occupations have been listed for biologists.

The biological science major resides in the Department of Biology (<http://www.drexel.edu/bioscience>). 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. Graduates in the biological sciences are in demand and enjoy a high placement rate with competitive salaries. Graduates with a degree in the biological sciences work for pharmaceutical companies, medical research laboratories, or biotechnology companies, or in government laboratories. The course requirements identifies required support courses in chemistry, physics, mathematics, humanities, and science and human affairs. 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/internship employment is an option for biological science students. The major offers three distinct plans:

Five-year option with co-op/internship 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 one co-op/internship experience

The degree includes just one six-month period of full-time 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 taking recommended electives.

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 taking recommended electives.

Requirements

Humanities and Social Sciences

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
COM 230	Techniques of Speaking	3.0
COM 310 [WI] or COM 320	Technical Communication Science Writing	3.0

PHIL 251	Ethics	3.0
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 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	Introduction to Analysis I	
MATH 102	Introduction to Analysis II	
MATH 239	Mathematics for the Life Sciences	
Calculus		
MATH 121	Calculus I	
MATH 122	Calculus II	
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
CHEM 241	Organic Chemistry I	4.0
CHEM 242	Organic Chemistry II	4.0
BIO 311	Biochemistry	4.0
or CHEM 243	Organic Chemistry III	
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
ENVS 212	Evolution	4.0
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
Concentration Courses		28.0-30.0
Free electives		24.0
Total Credits		183.5

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	
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
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Total Credits **28.0**

* Students interested in pursuing a focus area in Neurobiology, Pharmaceuticals, 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 231	Cell Physiology	3.0
BIO 244	Genetics I	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 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 445	Microbial Genetics	3.0
BIO 447	Advanced Genetics and Molecular Biology	3.0
BIO 451	Genetic Reg Development	3.0
BIO 461	Neurobiology of Autism Disorders	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

BIO 498	Independent Study	0.5-12.0
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Organismal/Physiology Electives

BIO 201	Human Physiology I	4.0
BIO 221	Microbiology	3.0
BIO 223	Parasitology	3.0
BIO 256	Vertebrate Morphology and Physiology	5.0
BIO 260	Plant Biology I	4.0
BIO 270	Development Biology	3.0
BIO 284	Biology of Stress	3.0
BIO 310	Comparative Physiology	3.0
BIO 322	Mycology	4.5
BIO 368	Embryology	4.0
BIO 370	Teratology	3.0
BIO 386	Gross Anatomy I	3.0
BIO 412	Biology of Aging	3.0
BIO 420	Virology	3.0
BIO 426	Immunology	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	Human 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 343	Equatorial Guinea: Field Methods	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	Diversity, Evolution and Ecology of Algae	3.0
ENVS 470	Advanced Topics in Evolution	3.0

Laboratory Electives

BIO 202	Human Physiology Laboratory	2.0
BIO 215 [WI]	Techniques in Cell Biology	2.5
BIO 222	Microbiology Laboratory	2.0
BIO 257	Vertebrate Morphology & Physiology Lab	2.0
BIO 271	Developmental Biology Laboratory	2.0
BIO 306	Biochemistry Laboratory	2.0
BIO 313	Comparative Physiology Laboratory	2.0
BIO 387	Gross Anatomy I Laboratory	2.0
BIO 389	Gross Anatomy II Lab	2.0
BIO 406	Computational Biochemistry Laboratory	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 365	Animal Behavior Laboratory	2.0
ENVS 394	Entomology Laboratory	2.0

BIO 498	Independent Study (by permission of the department)	0.5-12.0
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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 BIO 254	Invertebrate Morphology and Physiology	
BIO 203	Human Physiology II	4.0
or BIO 256	Vertebrate Morphology and Physiology	
BIO 270	Development 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	

Organismal Biology/Physiology 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
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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 311	Biochemistry	4.0
BIO 314	Pharmacology	3.0
BIO 318	Biology of Cancer	3.0
BIO 346	Stem Cell Research	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 444	Human Genetics	3.0
BIO 449	Recombinant DNA Laboratory	5.0
BIO 461	Neurobiology of Autism Disorders	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 203	Human Physiology II	4.0
BIO 221	Microbiology	3.0
BIO 223	Parasitology	3.0
BIO 254	Invertebrate Morphology and Physiology	3.0
BIO 256	Vertebrate Morphology and Physiology	5.0
BIO 262	Plant Biology II	4.0
BIO 264	Ethnobotany	3.0
BIO 284	Biology of Stress	3.0
BIO 310	Comparative Physiology	3.0
BIO 320	Microbial Pathogenesis	3.0
BIO 322	Mycology	4.5
BIO 368	Embryology	4.0
BIO 370	Teratology	3.0
BIO 386	Gross Anatomy I	3.0
BIO 388	Gross Anatomy II	2.0
BIO 412	Biology of Aging	3.0
BIO 420	Virology	3.0
BIO 424	Microbial Physiology	3.0
BIO 426	Immunology	3.0
BIO 435	Immunobiology of Disease	3.0
BIO 466	Endocrinology	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	Human 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 343	Equatorial Guinea: Field Methods	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	Diversity, Evolution and Ecology of 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 215 [WI]	Techniques in Cell Biology	2.5
BIO 222	Microbiology Laboratory	2.0

BIO 257	Vertebrate Morphology & Physiology Lab	2.0
BIO 271	Developmental Biology Laboratory	2.0
BIO 306	Biochemistry Laboratory	2.0
BIO 313	Comparative Physiology Laboratory	2.0
BIO 333	Bioinformatics Laboratory	2.0
BIO 387	Gross Anatomy I Laboratory	2.0
BIO 389	Gross Anatomy II Lab	2.0
BIO 406	Computational Biochemistry Laboratory	2.0
BIO 427	Immunology Laboratory	2.0
BIO 434 [WI]	Advanced Cell Biology Laboratory	2.0
BIO 449	Recombinant DNA Laboratory	5.0
ENVS 255	Invertebrate Morphology and Physiology Lab	2.0
ENVS 344	Equatorial Guinea: Field Research	6.0
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	Human Population Genetics	3.0-4.0
or ENVS 230	General Ecology	
Select one of the following:		3.0-5.0
BIO 221	Microbiology	
BIO 223	Parasitology	
BIO 256	Vertebrate Morphology and Physiology	
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	Diversity, Evolution and Ecology of 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 311	Biochemistry	4.0
BIO 314	Pharmacology	3.0
BIO 318	Biology of Cancer	3.0
BIO 346	Stem Cell Research	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 449	Recombinant DNA Laboratory	5.0
BIO 461	Neurobiology of Autism Disorders	3.0
BIO 462	Biology of Neuron Function	3.0
BIO 463	Molecular Mechanisms of Neurodegeneration	3.0
BIO 498	Independent Study (by permission of the department)	0.5-12.0
ENVS 326	Molecular Ecology	3.0

Organismal/Physiology electives

BIO 201	Human Physiology I	4.0
BIO 221	Microbiology	3.0
BIO 223	Parasitology	3.0
BIO 256	Vertebrate Morphology and Physiology	5.0
BIO 260	Plant Biology I	4.0
BIO 284	Biology of Stress	3.0
BIO 310	Comparative Physiology	3.0
BIO 322	Mycology	4.5
BIO 368	Embryology	4.0
BIO 386	Gross Anatomy I	3.0
BIO 388	Gross Anatomy II	2.0
BIO 412	Biology of Aging	3.0
BIO 420	Virology	3.0
BIO 426	Immunology	3.0
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	Human Population Genetics	4.0

ENVS 230	General Ecology	3.0
ENVS 247	Native Plants and Sustainability	3.0
ENVS 284 [WI]	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 336	Terrestrial Ecology	5.0
ENVS 343	Equatorial Guinea: Field Methods	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	Diversity, Evolution and Ecology of 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 215 [WI]	Techniques in Cell Biology	2.5
BIO 222	Microbiology Laboratory	2.0
BIO 257	Vertebrate Morphology & Physiology Lab	2.0
BIO 271	Developmental Biology Laboratory	2.0
BIO 306	Biochemistry Laboratory	2.0
BIO 313	Comparative Physiology Laboratory	2.0
BIO 333	Bioinformatics Laboratory	2.0
BIO 387	Gross Anatomy I Laboratory	2.0
BIO 389	Gross Anatomy II Lab	2.0
BIO 406	Computational Biochemistry Laboratory	2.0
BIO 427	Immunology Laboratory	2.0
BIO 449	Recombinant DNA Laboratory	5.0
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 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 223	Parasitology	3.0
or BIO 420	Virology	
BIO 320	Microbial Pathogenesis	3.0
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 311	Biochemistry	4.0
BIO 314	Pharmacology	3.0
BIO 318	Biology of Cancer	3.0
BIO 346	Stem Cell Research	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 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 449	Recombinant DNA Laboratory	5.0
BIO 462	Biology of Neuron Function	3.0
BIO 463	Molecular Mechanisms of Neurodegeneration	3.0
BIO 465	Neurobiology of Disease	3.0
BIO 498	Independent Study (by permission of the department)	0.5-12.0

Organismal/Physiology electives

BIO 201	Human Physiology I	4.0
BIO 221	Microbiology	3.0
BIO 223	Parasitology	3.0
BIO 256	Vertebrate Morphology and Physiology	3.0
BIO 260	Plant Biology I	4.0
BIO 262	Plant Biology II	4.0
BIO 270	Development Biology	3.0
BIO 284	Biology of Stress	3.0
BIO 310	Comparative Physiology	3.0
BIO 322	Mycology	4.5
BIO 368	Embryology	4.0
BIO 370	Teratology	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 424	Microbial Physiology	3.0
BIO 435	Immunobiology of Disease	3.0
BIO 466	Endocrinology	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	Human 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 343	Equatorial Guinea: Field Methods	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	Diversity, Evolution and Ecology of 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 215 [WI]	Techniques in Cell Biology	2.5
BIO 222	Microbiology Laboratory	2.0
BIO 257	Vertebrate Morphology & Physiology Lab	2.0
BIO 271	Developmental Biology Laboratory	2.0
BIO 306	Biochemistry Laboratory	2.0
BIO 313	Comparative Physiology Laboratory	2.0
BIO 333	Bioinformatics Laboratory	2.0
BIO 387	Gross Anatomy I Laboratory	2.0
BIO 389	Gross Anatomy II Lab	2.0
BIO 406	Computational Biochemistry Laboratory	2.0
BIO 427	Immunology Laboratory	2.0
BIO 449	Recombinant DNA Laboratory	5.0
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 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 231	Cell Physiology	3.0
BIO 244	Genetics I	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 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 445	Microbial Genetics	3.0
BIO 447	Advanced Genetics and Molecular Biology	3.0
BIO 449	Recombinant DNA Laboratory	5.0
BIO 451	Genetic Reg Development	3.0
BIO 462	Biology of Neuron Function	3.0
BIO 465	Neurobiology of Disease	3.0
ENVS 326	Molecular Ecology	3.0
BIO 498	Independent Study (by permission of the department)	0.5-12.0

Organismal/Physiology electives

BIO 201	Human Physiology I	4.0
BIO 203	Human Physiology II	4.0
BIO 221	Microbiology	3.0
BIO 223	Parasitology	3.0
BIO 256	Vertebrate Morphology and Physiology	5.0
BIO 260	Plant Biology I	4.0
BIO 262	Plant Biology II	4.0
BIO 264	Ethnobotany	3.0
BIO 270	Development Biology	3.0
BIO 284	Biology of Stress	3.0
BIO 310	Comparative Physiology	3.0
BIO 320	Microbial Pathogenesis	3.0
BIO 322	Mycology	4.5
BIO 368	Embryology	4.0
BIO 370	Teratology	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 424	Microbial Physiology	3.0
BIO 426	Immunology	3.0
BIO 435	Immunobiology of Disease	3.0
BIO 466	Endocrinology	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	4.0
ENVS 230	General Ecology	3.0
ENVS 247	Native Plants and Sustainability	3.0
ENVS 284 [WI]	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 324	Microbial Ecology	3.0
ENVS 328	Conservation Biology	3.0
ENVS 330	Aquatic Ecology	3.0
ENVS 336	Terrestrial Ecology	5.0
ENVS 343	Equatorial Guinea: Field Methods	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	Diversity, Evolution and Ecology of 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
ENVS 520	Field Methods of Paleoecology	3.0

Laboratory electives

BIO 202	Human Physiology Laboratory	2.0
BIO 215 [WI]	Techniques in Cell Biology	2.5
BIO 222	Microbiology Laboratory	2.0
BIO 255	Invertebrate Morphology and Physiology Laboratory	2.0
BIO 256	Vertebrate Morphology and Physiology	5.0
BIO 271	Developmental Biology Laboratory	2.0
BIO 306	Biochemistry Laboratory	2.0
BIO 313	Comparative Physiology Laboratory	2.0

BIO 333	Bioinformatics Laboratory	2.0
BIO 387	Gross Anatomy I Laboratory	2.0
BIO 389	Gross Anatomy II Lab	2.0
BIO 406	Computational Biochemistry Laboratory	2.0
BIO 427	Immunology Laboratory	2.0
BIO 449	Recombinant DNA Laboratory	5.0
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 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: BIO 449, ENVS 336, ENVS 382 and ENVS 388 have both a lecture and laboratory component.

Sample Plans of Study

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	Composition and Rhetoric I: Inquiry and Exploratory Research	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
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
MATH 122 or 102	Calculus II Introduction to Analysis II	4.0
CIVC 101	Introduction to Civic Engagement	1.0
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: Thematic Analysis Across Genres	3.0
MATH 239 or 123	Mathematics for the Life Sciences Calculus III	4.0
COOP 101	Career Management and Professional Development	0.0
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
PHYS 154	Introductory Physics III	4.0
PHIL 251	Ethics	3.0

Term Credits **15.0**

Term 7

Sci, tech, health & human affairs elective		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
Biology Laboratory Requirement		2.0

Term Credits **14.0**

Term 8

Free Elective		3.0
BIO/ENVS Elective		3.0
COM 230	Techniques of Speaking	3.0
MATH 410	Scientific Data Analysis I	3.0
Free Elective		3.0

Term Credits **15.0**

Term 9

COM 310	Technical Communication [WI]	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
Free Elective		3.0
Humanities/Social Science Elective		3.0

BIO/ENVS Electives	6.0
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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.

Biological Sciences Major: Five-year Co-op

Term 1	Credits
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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
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
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
MATH 122	Calculus II	4.0
or 102	Introduction to Analysis II	
CIVC 101	Introduction to Civic Engagement	1.0

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: Thematic Analysis Across Genres	3.0
MATH 239	Mathematics for the Life Sciences	4.0
or 123	Calculus III	
COOP 101	Career Management and Professional Development	0.0

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
PHYS 154	Introductory Physics III	4.0
PHIL 251	Ethics	3.0

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	Technical Communication [WI]	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.

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

Term 1		Credits
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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
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
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
CHEM 102	General Chemistry II	4.5
MATH 122 or 102	Calculus II Introduction to Analysis II	4.0
CIVC 101	Introduction to Civic Engagement	1.0

Term Credits **17.0**

Term 3

BIO 126	Physiology and Ecology	4.5
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
CHEM 103	General Chemistry III	5.0
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 224	Form, Function & Evolution of Vertebrates	4.0
BIO 225	Vertebrate Biology and Evolution Laboratory	2.0
BIO 311 or CHEM 243	Biochemistry Organic Chemistry III	4.0
PHYS 154	Introductory Physics III	4.0
PHIL 251	Ethics	3.0

Term Credits **17.0**

Term 7

Humanities/Social Science Elective	3.0
MATH 410 Scientific Data Analysis I	3.0
ENVS 212 Evolution	4.0
BIO/ENVS Elective	3.0
Sci, tech, health & human affairs elective	3.0
Term Credits	16.0

Term 8

Humanities/Social Science Elective	3.0
COM 310 Technical Communication [WI]	3.0
MATH 411 Scientific Data Analysis II	3.0
BIO/ENVS Elective	3.0
Term Credits	12.0

Term 9

BIO/ENVS Elective	3.0
Biology Laboratory Requirement Course*	2.0
COM 230 Techniques of Speaking	3.0
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.

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, medical research laboratories, biotechnology companies, or in government laboratories. Many graduates also choose to pursue an advanced degree in the field.

Co-op Opportunities

Past co-op employers of biosciences majors have included:

- GlaxoSmithKline
- AstraZeneca Pharmaceuticals
- Wistar Institute
- Moss Rehab
- ViroPharma, Inc.
- NovaFlora, Inc.
- Wyeth

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 undergraduate or 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:

Krista Featherstone
 Graduate Program Manager
 Department of Biology
 215.895.6374
kaf344@drexel.edu (coless@drexel.edu)

Minor in Biological Sciences

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
BIO 224	Form, Function & Evolution of Vertebrates	4.0
ENVS 212	Evolution	4.0
Total Credits		25.5

* A grade of "C" or better must be earned for each course in this minor for the course to meet the requirement.

Facilities

The Department of Biology 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 microscopes, centrifuges, chromatographs, spectrophotometers, scintillation counters, culture chambers, and densitometers.

Visit the Biology Research Assets (<http://www.drexel.edu/biology/research/researchAssets>) page for more information.

Biology Faculty

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

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

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

Felice Elefant, PhD (*Temple University*). Assistant Professor. Understanding the roles of two classes of chromatin regulatory proteins termed histone acetyltransferases (HATs) and histone demethylases.

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

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

Gail Hearn, PhD (*Rockefeller University*). Professor. The conservation of primate species on Bioko Island in Equatorial Guinea, Africa.

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

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

Karen Kabnick, PhD (*Massachusetts Institute of Technology*). Assistant Teaching Professor. Principles and techniques in molecular biology.

Robert P. Loudon, Ph.D. (*Thomas Jefferson University*). Associate Teaching Professor. Immunology and molecular biology.

Eric M. Morschhauser, PhD (*University of Pennsylvania*). Assistant Teaching Professor. Paleobiology, systematics, biomechanics, applications of high resolution CT scanning.

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

Jerome Ricard, PhD (*University Joseph Fourier-Grenoble, France*). Assistant Research Professor. Parasitology

Valerie Bracchi Ricard, PhD (*University of Grenoble, France*). Assistant Research Professor. Molecular and cell biology

Jacob Russell, PhD (*University of Arizona*). Associate Professor. The functional significance and evolutionary histories of symbioses between insects and bacteria.

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

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

Elizabeth A. Spudich, PhD (*Thomas Jefferson University*). Instructor. Developmental biology, experimental teratology, and cell biology focusing on inflammation and immunology.

Jennifer Stanford, PhD (*Harvard University*). Assistant Professor. Approaches to improve undergraduate and graduate student learning in cell and molecular biology, biochemistry and genetics.

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.

Interdepartmental Faculty

Beth L. Leonberg, MS, MA, RD (*Colorado State University, Rowan University*) Director, Didactic Program in Dietetics . Instructor. Pediatric nutrition.

Donna H. Mueller, PhD (*Temple University*) Registered Dietitian, Nutrition and Foods. Associate Professor. Clinical nutrition; pediatric nutrition; nutrition in pulmonary diseases, especially cystic fibrosis; nutrition in developmental delay; dental nutrition; dietetic education and professional development.

Jennifer Nasser, PhD, RD, FTOS (*Rutgers University*) Director, PhD program. 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.

Michael O'Connor, MD, PhD (*MD, Johns Hopkins University; PhD, Colorado State*). Associate 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.

Jennifer Quinlan, PhD (*North Carolina State University*). Associate Professor. Food microbiology; microbiological quality and safety of produce, dairy and meat products in markets in high vs. low socioeconomic areas, Bacillus and Clostridium spores in food processing.

Vicki S. Schwartz, DCN, MS, RD, CNSC (*Rutgers University*) Nutrition and Foods. Assistant Clinical Professor. Advanced nutrition, clinical nutrition, nutrition support.

Emeritus Faculty

Wayne E. Magee, PhD (*University of Wisconsin*). Professor Emeritus. Biochemistry and microbiology, drug delivery using phospholipid vesicles, membrane-membrane interactions, hybridoma research for monoclonal antibody production, immunotherapy, biochemical virology.

Stanley Segall, PhD (*Massachusetts Institute of Technology*). Professor Emeritus. Flavor evaluation in foods, human organoleptic response, taste and odor, chemistry of sugars in foods, irradiation effects in foods, food science, food safety.

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 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 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.

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.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Corequisite: EXAM 080

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 102 [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. Fall.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if 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, eutrophication, 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 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 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

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 214 Principles of Cell Biology 3.0 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

Prerequisites: BIO 104 [Min Grade: D] or BIO 122 [Min Grade: D] or BIO 141 [Min Grade: D]

BIO 215 [WI] Techniques in Cell Biology 2.5 Credits

A course designed to introduce students to the lab techniques used by cell biologists. Microscopy is used for cell structure and their organelles, phagocytosis, cytoskeletal structure, muscle contraction and cell motility. Other topics include fractional by centrifugation, protein separation and quantification, and gel electrophoresis. This is a writing intensive course.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 104 [Min Grade: D] or BIO 122 [Min Grade: D] or TDEC 122 [Min Grade: D] or BIO 117 [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 expressed and regulated.

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 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 223 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

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: BIO 122 [Min Grade: D] or BIO 124 [Min Grade: D]

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 227 Exploring Parasites 2.0 Credits

Exploring Parasites Laboratory will safely introduce students to hands-on experiences with a vast diversity of human parasites to understand their evolutionary adaptations. Students will learn to culture *Giardia lamblia*, an enteric parasite, and design a term-long research project to study an aspect of *Giardia* biology of student interest.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: BIO 223 [Min Grade: C] (Can be taken Concurrently)

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 231 Cell Physiology 3.0 Credits

Molecular biology of the cell, including regulation of function, genetic mechanisms, chemistry and structure of cellular components, and cell-to-cell interactions.

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 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]

Corequisite: BIO 257

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 224 [Min Grade: D]

Corequisite: BIO 256

BIO 260 Plant Biology I 4.0 Credits

This course provides an understanding of phylogenetic relationships among plant families. Students see the practical results of evolution by examining and comparing the properties of existing plant families.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: BIO 101 [Min Grade: D] or BIO 104 [Min Grade: D] or BIO 109 [Min Grade: D] or BIO 141 [Min Grade: D] or BIO 123 [Min Grade: D] or BIO 124 [Min Grade: D]

BIO 262 Plant Biology II 4.0 Credits

In this course, students learn the structure and function of higher vascular plants as organisms. Plant development, growth and behavior are examined at both the molecular and structural levels to give a comprehensive view of the plant and its environment.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: BIO 260 [Min Grade: D]

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 270 Development 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 214 [Min Grade: D] and BIO 218 [Min Grade: D]) or BIO 211 [Min Grade: D]

BIO 271 Developmental Biology Laboratory 2.0 Credits

Includes observations into development processes in a diverse group of organisms including developmental principles in simple multicellular protists, 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. Please see the department for more information.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 270 [Min Grade: D] (Can be taken Concurrently)

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 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]

BIO 310 Comparative Physiology 3.0 Credits

Provides comparative study of the physiology of vertebrate and invertebrate animals. Examines physiological principles by studying cardiovascular adaptations, water balance, respiratory adaptations, and other homeostatic mechanisms in model systems, including fish, amphibians, mammals, birds, and invertebrates.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: BIO 201 [Min Grade: D] or BIO 224 [Min Grade: D] or ENVS 284 [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]

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 313 Comparative Physiology Laboratory 2.0 Credits

Computational laboratory examining quantitative facets of vertebrate physiology through simulation experiments. Complements BIO 310 Comparative Physiology. Example systems examined include gas and solute exchangers, open vs closed circulations, and thermoregulatory controllers. 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 310 [Min Grade: D] (Can be taken Concurrently)

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 322 Mycology 4.5 Credits

Covers morphology, taxonomy, and physiology of yeasts and molds, with emphasis on species of economic importance; plant and animal pathogens; industrial fermentations; toxin production; decomposition of organic materials; and fungal morphogenesis.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: BIO 221 [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 utilized in the analysis of genes and genomes. Topics include genomic databases, genome annotation, sequence alignment, metagenomic analyses, and phylogenetics.

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 continues the application of computational algorithms for manipulation and analysis of biological information covered in BIO 331 (Bioinformatics I). It covers genomic and proteome informatic approaches and applications for determining evolutionary relationships, discovery of protein structure/function relationships and bioengineering of proteins by molecular modeling by homology.

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 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 discussed.

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 370 Teratology 3.0 Credits

This course will expand on the concepts of developmental biology by examining the agents that interfere with normal development. We will be exploring these agents through presentations and discussion of current peer reviewed literature. The focus will be on an understanding of mechanisms of action and how they are influenced by dose pharmacology and genetics.

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 368 [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 406 Computational Biochemistry Laboratory 2.0 Credits

This course uses kinetic analysis of biochemical data to increase the computational and numerical sophistication used to build sound models of the underlying biological processes. Students start with Excel as the analytical tool. MATLAB is then used as the complexity of the problems demands it.

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 versus 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 and 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 424 Microbial Physiology 3.0 Credits

Covers physiology and metabolism of microorganisms with emphasis on aspects unique to prokaryotes, including envelope structure, transport systems, modes of nutrition, biosynthesis, growth, and mechanisms of action of antibiotics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: BIO 221 [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 Human 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 ENV5 212 [Min Grade: D])

BIO 442 Modeling Methods in Biology I 3.0 Credits

Offers practical experience in the modeling of simple biological systems, including the applications of linear, trigonometric, and exponential functions in biology and the use of differential and integral calculus, simple differential equations, and the Eulerian approach to simulation. Emphasizes practical computational use of such tools in biological problems. Offered in alternate years.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

BIO 443 Modeling Methods in Biology II 3.0 Credits

Offers a practical introduction to the modeling of dynamic biological processes, including deterministic and stochastic processes. Emphasizes the development and construction of working models and the interpretation of results. Discusses both mechanistic and empirical/predictive models. Students develop their own model of a real-world biological process. Offered in alternate years.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: BIO 442 [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 of 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 445 Microbial Genetics 3.0 Credits

Covers genetic organization and regulation in bacteriophage and bacteria, techniques of genetic manipulation of microbial genomes, genetic interactions of microbes under natural conditions and the use of microbial genome modification in industry.

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 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: Can enroll if major is BIO.

Cannot enroll if classification is Freshman

Prerequisites: (BIO 218 [Min Grade: D] or BIO 211 [Min Grade: D]) and BIO 244 [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]

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]

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]

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]

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 from 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] and (BIO 214 [Min Grade: D] and BIO 218 [Min Grade: D]) or BIO 211 [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 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 480 Special Studies Biological Science 12.0 Credits

Covers special topics offered in biology. Current offerings include Biotechnology, Biology of Cancer, Ethnobiology, Neurobiology, and Bioinformatics, as well as other selected topics of interest in molecular biology, genetics, and biotechnology.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

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 498 Independent Study 0.5-12.0 Credits

Provides independent study 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

Minor in Bioscience and Society

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.

Required Courses *

Select one of the following options: 3.0-4.0

BIO 100 Applied Cells, Genetics & Physiology

or

BIO 107 Cells, Genetics & Physiology
& BIO 108 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 Biological Diversity, Ecology & Evolution
& BIO 110 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 116 How Your Body Works-Or Not

BIO 118 Basics of Cancer

BIO 264 Ethnobotany

BIO 284 Biology of Stress

BIO 312 Genetically Modified Foods

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.

Chemistry

Bachelor of Arts Degree: 184.5 quarter credits

Bachelor of Science Degree: 190.5 quarter credits

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 Chemistry Department (<http://www.drexel.edu/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.

About the Accelerated Bachelor's/Master's Dual Degree Program in Chemistry

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

Degree Requirements (BA)

General Education Requirements *

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
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
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		36.0
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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) taking two terms of sequential study of a foreign language (or placement at the exit level of 103 or above); or (2) taking two terms of a computer language or placement out as determined by the Department of Computer Science.

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

Sample Plan of Study (BA)

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
MATH 121	Calculus I	4.0
UNIV S101	The Drexel Experience	1.0
Term Credits		17.5
Term 2		Credits
BIO 124	Evolution & Organismal Diversity	4.5
CHEM 122	Majors Chemistry II	5.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0

MATH 122	Calculus II	4.0
CIVC 101	Introduction to Civic Engagement	1.0
Term Credits		17.5

Term 3

BIO 126	Physiology and Ecology	4.5
CHEM 123	Majors Chemistry III	5.5
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
MATH 123	Calculus III	4.0
Term Credits		17.0

Term 4

CHEM 230*	Quantitative Analysis	4.0
CHEM 231	Quantitative Analysis Laboratory [WI]*	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

CHEM 253	Thermodynamics and Kinetics	4.0
CHEM 367	Chemical Information Retrieval	3.0
CHEM 421	Inorganic Chemistry I	3.0
PHYS 201	Fundamentals of Physics III	4.0
UNIV S201	Looking Forward: Academics and Careers	1.0
Term Credits		15.0

Term 8

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

Term 9

Diversity Studies elective		3.0
Social and Behavioral Sciences elective		3.0
International Studies elective		3.0
Language course		4.0
Term Credits		13.0

Term 10

Social and Behavioral Sciences elective		3.0
Free electives		12.0
Term Credits		15.0

Term 11

Chemistry elective		3.0
Free elective		12.0
Term Credits		15.0

Term 12

Free electives		12.0
Term Credits		12.0

Total Credit: 184.5

* CHEM 230 and CHEM 231 must be taken concurrently.

Degree Requirements (BS)**General Education Requirements**

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
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
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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.

Sample Plans of Study (BS)**Five-year Co-op**

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

		Credits
Term 1		
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
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: The Craft of Persuasion	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	Composition and Rhetoric III: Thematic Analysis Across Genres	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	Quantitative Analysis Laboratory	2.0
[WI]*		
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	Differential Equations	4.0
or 201	Linear Algebra	

Term Credits **18.0**

Term 7

CHEM 270	Software Skills for Chemists	3.0
CHEM 357	Physical Chemistry Laboratory I	2.5
[WI]		
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	Analytical Chemistry II	4.0
[WI]		
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	Free elective	6.0	
CHEM 358	Physical Chemistry Laboratory II	2.5			
Term Credits		15.0	Term Credits	16.5	
Term 11					
BIO 306	Biochemistry Laboratory	2.0	BIO 214	Principles of Cell Biology	3.0
CHEM 493	Senior Research Project	3.0	CHEM 249	Organic Chemistry for Majors III	7.0
Liberal Studies electives		6.0	MATH 210	Differential Equations	4.0
Free electives		6.0	or 201	Linear Algebra	
Term Credits		17.0	Technical elective ***		3.0
Term 12					
CHEM 422	Inorganic Chemistry II	3.0	Term Credits		17.0
CHEM 425	Inorganic Chemistry Laboratory	4.0	Term 6		
CHEM 493	Senior Research Project	3.0	CHEM 253	Thermodynamics and Kinetics	4.0
Free electives		6.0	CHEM 367	Chemical Information Retrieval	3.0
Term Credits		16.0	CHEM 421	Inorganic Chemistry I	3.0
Total Credit: 190.5			CHEM 430	Analytical Chemistry I	3.0
			UNIV S201	Looking Forward: Academics and Careers	1.0
			Term Credits		14.0

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

Term 1		Credits	Term 8			
BIO 122	Cells and Genetics	4.5	CHEM 270	Software Skills for Chemists	3.0	
CHEM 121	Majors Chemistry I	5.0	CHEM 357	Physical Chemistry Laboratory I [WI]	2.5	
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0	CHEM 420	Molecular Symmetry and Group Theory Applied Chemistry	3.0	
MATH 121	Calculus I	4.0	CHEM 431	Analytical Chemistry II [WI]	4.0	
UNIV S101	The Drexel Experience	1.0	Free elective		3.0	
Term Credits		17.5	Term Credits			15.5
Term 2						
CHEM 122	Majors Chemistry II	5.0	Term 9			
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0	Liberal Studies elective		3.0	
MATH 122	Calculus II	4.0	Technical elective ***		3.0	
PHYS 101	Fundamentals of Physics I	4.0	Free electives		9.0	
CIVC 101	Introduction to Civic Engagement	1.0	Term Credits			15.0
Term Credits		17.0	Term 10			
Term 3						
CHEM 123	Majors Chemistry III	5.5	BIO 311	Biochemistry	4.0	
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0	or 404	Structure and Function of Biomolecules		
MATH 123	Calculus III	4.0	CHEM 346	Qualitative Organic Chemistry	5.5	
PHYS 102	Fundamentals of Physics II	4.0	CHEM 355	Physical Chemistry IV	3.0	
Term Credits		16.5	CHEM 493	Senior Research Project	3.0	
Term 4						
CHEM 230*	Quantitative Analysis	4.0	Term Credits			15.5
CHEM 231	Quantitative Analysis Laboratory [WI]*	2.0	Term 11			
CHEM 246	Organic Chemistry for Majors I	6.5	BIO 306	Biochemistry Laboratory	2.0	
PHYS 201	Fundamentals of Physics III	4.0	CHEM 359	Atomic and Molecular Spectroscopy	3.0	
Term Credits		16.5	CHEM 493	Senior Research Project	3.0	
Term 5						
CHEM 248	Organic Chemistry for Majors II	6.5	Liberal Studies elective		3.0	
MATH 200	Multivariate Calculus	4.0	Free elective		3.0	
			Term Credits			14.0
Term 12						
CHEM 358	Physical Chemistry Laboratory II	2.5	Term 12			
CHEM 422	Inorganic Chemistry II	3.0	CHEM 358	Physical Chemistry Laboratory II	2.5	
CHEM 425	Inorganic Chemistry Laboratory	4.0	CHEM 422	Inorganic Chemistry II	3.0	
CHEM 493	Senior Research Project	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		Credits
Term 1		
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
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: The Craft of Persuasion	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	Composition and Rhetoric III: Thematic Analysis Across Genres	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	Quantitative Analysis Laboratory [WI]*	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	3.0
CHEM 249	Organic Chemistry for Majors III	7.0
MATH 210 or 201	Differential Equations or Linear Algebra	4.0
Technical Elective***		3.0
Term Credits		17.0
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
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Term 9		
CHEM 270	Software Skills for Chemists	3.0
CHEM 357	Physical Chemistry Laboratory I [WI]	2.5
CHEM 420	Molecular Symmetry and Group Theory Applied Chemistry	3.0
CHEM 431	Analytical Chemistry II [WI]	4.0
Elective		3.0

Term Credits	15.5
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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
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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
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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
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Total Credit: 190.5

* 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.

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 endothelium 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.

Minor in Chemistry

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

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 an electronic instrument specialist (for NMR and MS- Chemistry Department), a glassblower (Chemistry Department), two electronics specialists (College of Arts & Sciences Electronics Shop), and four machinists (Drexel University Machine Shop).

Chemistry Faculty

Anthony W. Addison, PhD (*University of Kent at Canterbury, England*). Professor. 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.

Joe P. Foley, PhD (*University of Florida*) Associate Department Head. 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.

Monica Ilies, PhD (*Polytechnic University of Bucharest*). Assistant Teaching Professor.

Haifeng Frank Ji, PhD (*Chinese Academy of Sciences*). Associate Professor. Micromechanical sensors for biological and environmental applications; nanomechanical drug screening technology; drug discovery; nanotechnology for energy applications.

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.

Daniel A. Kleier, PhD (*University of Notre Dame*). Associate Teaching Professor.

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*). Assistant Teaching Professor.

Louis Scerbo, PhD (*Oregon State University at Corvallis*). Associate Professor. Membrane structures and function.

Reinhard Schweitzer-Stenner, PhD (*Universität Bremen*) Department Head, Chemistry. 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.

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

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

Jun Xi, PhD (*Cornell University*). Associate Teaching Professor.

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, stoichiometry, 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, organic 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 ¹H 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, ¹H and ¹³C 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, Hecke 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 professional 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 243 [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 480 Special Topics in Chemistry 5.0 Credits

This course covers a selected special topic in chemistry. May be repeated three times for credit.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 3 times for 15 credits

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.

Communication

Bachelor of Science: 182.0 quarter credits

Bachelor of Arts: 182.0 quarter credits

About the Program

The Communication department offers a major in communication, with concentrations in corporate and public relations, journalism, and technical and science communication.

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

All communication majors take a common core of courses that emphasize communication theory and methods. They then specialize in one of three concentrations. Students in the corporate and public relations concentration pursue careers in public relations, corporate training, 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. Journalism students pursue careers in journalism and news. Many communication graduates also go on to law school, to business school for an MBA, or to graduate school.

Students who elect the corporate and public relations concentration have the option of pursuing either a bachelor of arts degree or a bachelor of science degree. Students who elect the technical and science communication concentration must pursue the bachelor of science degree. Students in journalism must complete the requirements for the bachelor of arts degree.

Degree Requirements: Corporate and Public Relations (BA)

The concentration in corporate and 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, financial writing, publication design, employee and customer communication, desktop publishing, and government relations.

Skills in this field run the gamut from written to spoken to visual communication. A corporate communication 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.

General Requirements

ANTH 101	Introduction to Cultural Diversity	3.0
COM 150	Mass Media and Society	3.0
COM 360	International Communication	3.0

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
SOC 101	Introduction to Sociology	3.0
PSY 101	General Psychology I	3.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
CIVC 101	Introduction to Civic Engagement	1.0
Two mathematics courses		6.0-8.0
Two science courses		6.0-8.0
Foreign language courses (at least one must be at the 200-level.)		6.0-16.0
Three humanities/ fine arts courses		9.0
One social/behavioral sciences course		3.0
One international studies elective		3.0
Two studies in diversity electives		6.0

Communication Core Requirements

Theory Sequence

COM 101	Human Communication	3.0
COM 210	Theory and Models of Communication	3.0
COM 400	Seminar in Communication	3.0
SOC 260 [WI]	Classical Social Theory	3.0

Methods Sequence

COM 220	Qualitative Research Methods	3.0
SOC 250	Research Methods I	3.0
SOC 364	Computer-Assisted Data Analysis	3.0

Additional Core Requirements

COM 230	Techniques of Speaking	3.0
COM 240	New Technologies In Communication	3.0
COM 380	Special Topics in Communication Theory	3.0
COM 491	Senior Project in Communication I	3.0
COM 492	Senior Project in Communication II	3.0
PHIL 305	Communication Ethics	3.0

Corporate and Public Relations Concentration Requirements

COM 260 [WI]	Fundamentals of Journalism	3.0
COM 280	Public Relations Principles and Theory	3.0
COM 282 [WI]	Public Relations Writing	3.0
COM 284	Public Relations Research, Measurement and Evaluation	3.0
COM 286	Public Relations Strategies and Tactics	3.0
COM 386	Public Relations Campaign Planning	3.0
MKTG 301	Introduction to Marketing Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
LING 101	Introduction to Linguistics	3.0
or LING 102	Language and Society	

Select one of the following Visual Communication courses: *

COM 335	Electronic Publishing	3.0
COM 340	Desktop Publishing	

Culture and Communication Electives

Culture electives (Any two courses with a SOC, ANTH or CJ rubric. At 6.0 least one course must be at the 200-level or higher.)

Communication electives (Any four courses with a COM or LING rubric at the 200-level or higher) 12.0

Additional Electives

Free electives 24.0

Total Credits 182.0

* Or other courses as appropriate in Communication (COM) or offered by the College of Media Arts and Design.

Sample Plan of Study**Corporate and Public Relations Concentration (BA)**

Term 1	Credits
COM 101 Human Communication	3.0
ENGL 101 Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
PSY 101 General Psychology I	3.0
SOC 101 Introduction to Sociology	3.0
UNIV H101 The Drexel Experience	1.0
Mathematics course	3.0-4.0
Term Credits	16.0-17.0

Term 2	Credits
COM 150 Mass Media and Society	3.0
ENGL 102 Composition and Rhetoric II: The Craft of Persuasion	3.0
CIVC 101 Introduction to Civic Engagement	1.0
Humanities/Fine arts elective	3.0
Foreign language course*	4.0
Mathematics course	3.0-4.0
Term Credits	17.0-18.0

Term 3	Credits
ANTH 101 Introduction to Cultural Diversity	3.0
COM 280 Public Relations Principles and Theory	3.0
ENGL 103 Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
Language course*	4.0
International studies elective	3.0
Term Credits	16.0

Term 4	Credits
COM 210 Theory and Models of Communication	3.0
COM 230 Techniques of Speaking	3.0
Culture elective*	3.0
Science elective	3.0-4.0
Free elective/language	3.0-4.0
Term Credits	15.0-17.0

Term 5	Credits
COM 220 Qualitative Research Methods	3.0
COM 282 Public Relations Writing [WI]	3.0
COM 260 Fundamentals of Journalism [WI]	3.0

Science elective 3.0-4.0
Free elective/language 3.0-4.0

Term 6	Term Credits	15.0-17.0
COM 240 New Technologies In Communication	3.0	
COM 284 Public Relations Research, Measurement and Evaluation	3.0	
SOC 260 [WI] Classical Social Theory	3.0	
Diversity studies elective	3.0	
Social and behavioral sciences elective	3.0	
Term Credits	15.0	

Term 7	Term Credits	15.0
COM 286 Public Relations Strategies and Tactics	3.0	
SOC 250 Research Methods I	3.0	
Communication elective*	3.0	
Culture elective*	3.0	
Diversity studies elective	3.0	
Term Credits	15.0	

Term 8	Term Credits	16.0
ORGB 300 Organizational Behavior [WI]	4.0	
PHIL 305 Communication Ethics	3.0	
SOC 364 Computer-Assisted Data Analysis	3.0	
LING 102 Language and Society or 101 Introduction to Linguistics	3.0	
Communication elective*	3.0	
Term Credits	16.0	

Term 9	Term Credits	17.0
COM 380 Special Topics in Communication Theory	3.0	
COM 386 Public Relations Campaign Planning	3.0	
MKTG 301 Introduction to Marketing Management	4.0	
Visual communication elective*	3.0	
Humanities/Fine arts elective	3.0	
UNIV H201 Looking Forward: Academics and Careers	1.0	
Term Credits	17.0	

Term 10	Term Credits	15.0
COM 400 Seminar in Communication	3.0	
COM 360 International Communication	3.0	
Communication elective*	3.0	
Humanities/Fine arts elective	3.0	
Free elective	3.0	
Term Credits	15.0	

Term 11	Term Credits	13.0
COM 491 Senior Project in Communication I	3.0	
Communication elective*	3.0	
Free electives	7.0	
Term Credits	13.0	

Term 12	Term Credits	13.0
COM 492 Senior Project in Communication II	3.0	

Free electives	9.0
Term Credits	12.0

Total Credit: 182.0-188.0

* See degree requirements.

Degree Requirements: Corporate and Public Relations (BS)

The concentration in corporate and public relations covers a broad range of activities that help an organization and its publics communicate with one another. The field includes public relations, media relations, financial writing, publication design, employee and customer communication, desktop publishing, and government relations.

Skills in this field run the gamut from written to spoken to visual communication. A corporate communication 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.

General Requirements

ANTH 101	Introduction to Cultural Diversity	3.0
or ANTH 110	Human Past: Anthropology and Prehistoric Archeology	
COM 150	Mass Media and Society	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
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
CIVC 101	Introduction to Civic Engagement	1.0
Political Science (PSCI) elective		4.0
Economics elective		4.0
Two History electives		6.0
Two English (ENGL) electives (200-level or above)		6.0
Fine arts elective		3.0
Philosophy elective		3.0

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
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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 210	Theory and Models of Communication	3.0
COM 400	Seminar in Communication	3.0
SOC 260 [WI]	Classical Social Theory	3.0

Methods Sequence

COM 220	Qualitative Research Methods	3.0
SOC 250	Research Methods I	3.0
SOC 364	Computer-Assisted Data Analysis	3.0

Additional Core Requirements

COM 230	Techniques of Speaking	3.0
COM 240	New Technologies In Communication	3.0
COM 380	Special Topics in Communication Theory	3.0
COM 491	Senior Project in Communication I	3.0
COM 492	Senior Project in Communication II	3.0
PHIL 305	Communication Ethics	3.0

Corporate and Public Relations Concentration Requirements

COM 260 [WI]	Fundamentals of Journalism	3.0
COM 280	Public Relations Principles and Theory	3.0
COM 282 [WI]	Public Relations Writing	3.0
COM 284	Public Relations Research, Measurement and Evaluation	3.0
COM 286	Public Relations Strategies and Tactics	3.0
COM 386	Public Relations Campaign Planning	3.0
MKTG 301	Introduction to Marketing Management	4.0
ORGB 300 [WI]	Organizational Behavior	4.0
LING 101	Introduction to Linguistics	3.0
or LING 102	Language and Society	

Visual Communication Courses *

Select one of the following:	3.0
COM 335	Electronic Publishing
COM 340	Desktop Publishing

Culture and Communication Electives

Communication Electives (Any four courses with a COM or LING rubric at the 200-level or higher) 12.0

Culture Electives (Any two courses with a SOC, ANTH or CJ rubric. At least one course must be at the 200-level or higher.) 6.0

Additional Electives

Free Electives	27.0
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Total Credits 182.0

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

Sample Plan of Study

Corporate and Public Relations Concentration (BS)

Term	Credits
Term 1	
COM 101 Human Communication	3.0
ENGL 101 Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
SOC 101 Introduction to Sociology	3.0
MATH 121 Calculus I	4.0
or 101 Introduction to Analysis I	
PSY 101 General Psychology I	3.0
UNIV H101 The Drexel Experience	1.0
Term Credits	17.0
Term 2	
COM 150 Mass Media and Society	3.0
ENGL 102 Composition and Rhetoric II: The Craft of Persuasion	3.0
MATH 122 Calculus II	4.0
or 102 Introduction to Analysis II	
CIVC 101 Introduction to Civic Engagement	1.0
Fine arts elective	3.0
History elective	3.0
Term Credits	17.0
Term 3	
ANTH 101 Introduction to Cultural Diversity	3.0
COM 280 Public Relations Principles and Theory	3.0
ENGL 103 Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
Political Science (PSCI) elective	4.0
Free elective	3.0
Term Credits	16.0
Term 4	
COM 210 Theory and Models of Communication	3.0
COM 230 Techniques of Speaking	3.0
Science sequence course 1*	4.0
English (ENGL) course (200-level or above)	3.0
Culture elective*	3.0
Term Credits	16.0
Term 5	
COM 220 Qualitative Research Methods	3.0
COM 260 Fundamentals of Journalism [WI]	3.0
COM 282 Public Relations Writing [WI]	3.0
Science sequence course 2*	4.0
History elective	3.0
Term Credits	16.0
Term 6	
COM 284 Public Relations Research, Measurement and Evaluation	3.0
SOC 260 [WI] Classical Social Theory	3.0

Communication elective*	3.0
Economics (ECON) elective	4.0
Philosophy (PHIL) elective	3.0

Term	Credits
Term 7	
COM 240 New Technologies In Communication	3.0
SOC 250 Research Methods I	3.0
COM 286 Public Relations Strategies and Tactics	3.0
Visual Communication elective	3.0
Culture elective*	3.0

Term	Credits
Term 8	
ORGB 300 Organizational Behavior [WI]	4.0
PHIL 305 Communication Ethics	3.0
SOC 364 Computer-Assisted Data Analysis	3.0
LING 102 Language and Society	3.0
or 101 Introduction to Linguistics	

Term	Credits
Term 9	
COM 380 Special Topics in Communication Theory	3.0
COM 386 Public Relations Campaign Planning	3.0
MKTG 301 Introduction to Marketing Management	4.0
UNIV H201 Looking Forward: Academics and Careers	1.0
Communication elective*	3.0
Free elective	3.0

Term	Credits
Term 10	
COM 400 Seminar in Communication	3.0
English (ENGL) course (200-level or above)	3.0
Communication elective	3.0
Free electives	6.0

Term	Credits
Term 11	
COM 491 Senior Project in Communication I	3.0
Communication elective*	3.0
Free electives	6.0-9.0

Term	Credits
Term 12	
COM 492 Senior Project in Communication II	3.0
Free electives	9.0

Total Credit: 182.0-185.0

* See degree requirements.

Degree Requirements: Journalism (BA)

Journalism provides students with the skills and theoretical perspective they need to practice journalism on an international stage. Journalism is an international business, and the range of potential jobs for graduates grows almost daily. An extension of the program's core curriculum, the

concentration hones the student's ability to write and edit while at the same time exposing the student to new and evolving aspects of the field.

General Requirements

ANTH 101	Introduction to Cultural Diversity	3.0
or ANTH 110	Human Past: Anthropology and Prehistoric Archeology	
COM 150	Mass Media and Society	3.0
COM 345	Intercultural Communication	3.0
or ANTH 312	Approaches to Intercultural Behavior	
COM 360	International Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
SOC 101	Introduction to Sociology	3.0
PSY 101	General Psychology I	3.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
CIVC 101	Introduction to Civic Engagement	1.0
Two mathematics courses		6.0-8.0
Two science courses		6.0-8.0
Foreign language courses *		8.0-16.0
Three humanities and fine arts electives		9.0
One social and behavioral sciences elective		3.0
One international studies elective		3.0
One studies in diversity elective		3.0

Communication Core Requirements

Theory Sequence

COM 101	Human Communication	3.0
COM 210	Theory and Models of Communication	3.0
COM 400	Seminar in Communication	3.0
SOC 260 [WI]	Classical Social Theory	3.0

Methods Sequence

COM 220	Qualitative Research Methods	3.0
SOC 250	Research Methods I	3.0
SOC 364	Computer-Assisted Data Analysis	3.0

Additional Core Requirements

COM 230	Techniques of Speaking	3.0
COM 240	New Technologies In Communication	3.0
COM 380	Special Topics in Communication Theory	3.0
COM 491	Senior Project in Communication I	3.0
COM 492	Senior Project in Communication II	3.0
PHIL 305	Communication Ethics	3.0

Journalism Concentration Requirements

COM 260 [WI]	Fundamentals of Journalism	3.0
COM 280	Public Relations Principles and Theory	3.0
COM 300 [WI]	On-line Journalism	3.0
COM 315	Investigative Journalism	3.0
COM 365	Journalists, the Courts, and the Law	3.0
COM 390 [WI]	Global Journalism	3.0
TVPR 220	TV News Writing	3.0

LING 101	Introduction to Linguistics	3.0
or LING 102	Language and Society	

Select one of the following: 3.0-4.0

PSCI 150	International Politics	
BLAW 340	International Business Law	
COM 362	International Negotiations	
SOC 340	Globalization	

Culture and Communication Electives

Culture electives (Any two courses with a SOC, ANTH or CJ rubric. 6.0
At least one course must be at the 200-level or higher.)

Communication electives (Any four courses with a COM rubric at the 200-level or higher.) 12.0

Additional Electives

Free Electives 30.0

Total Credits 182.0-195.0

* At least one foreign language course must be at the 200-level.

Sample Plan of Study

Journalism (BA)

Term 1		Credits
COM 101	Human Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
SOC 101	Introduction to Sociology	3.0
PSY 101	General Psychology I	3.0
UNIV H101	The Drexel Experience	1.0
Math elective		3.0-4.0
Term Credits		16.0-17.0
Term 2		Credits
COM 150	Mass Media and Society	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
CIVC 101	Introduction to Civic Engagement	1.0
Foreign language course		4.0
Humanities and fine arts elective		3.0
Math elective		3.0-4.0
Term Credits		17.0-18.0
Term 3		Credits
COM 260 [WI]	Fundamentals of Journalism	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
ANTH 110 or 101	Human Past: Anthropology and Prehistoric Archeology Introduction to Cultural Diversity	3.0
Foreign language course		4.0
International studies elective		3.0
Term Credits		16.0
Term 4		Credits
COM 210	Theory and Models of Communication	3.0
COM 240	New Technologies In Communication	3.0

LING 102 or 101	Language and Society Introduction to Linguistics	3.0
	Foreign language course/Free elective	4.0
	Culture elective *	3.0

Term Credits **16.0**

Term 5

COM 220	Qualitative Research Methods	3.0
COM 280	Public Relations Principles and Theory	3.0
COM 300	On-line Journalism	3.0
	[WI]	
	Foreign language/Free elective	3.0-4.0
	Science elective *	3.0-4.0

Term Credits **15.0-17.0**

Term 6

COM 230	Techniques of Speaking	3.0
COM 345 or ANTH 312	Intercultural Communication Approaches to Intercultural Behavior	3.0
SOC 250	Research Methods I	3.0
TVPR 220	TV News Writing	3.0
	Science elective *	3.0

Term Credits **15.0**

Term 7

COM 315	Investigative Journalism	3.0
SOC 260 [WI]	Classical Social Theory	3.0
	Social and behavioral sciences elective	3.0
	Communication elective *	3.0
	Humanities/Fine arts elective	3.0

Term Credits **15.0**

Term 8

COM 365	Journalists, the Courts, and the Law	3.0
	Select one of the following:	3.0-4.0
BLAW 340	International Business Law	
SOC 340	Globalization	
COM 362	International Negotiations	
PSCI 150	International Politics	
	Communication elective *	3.0
	Diversity studies elective	3.0
	Humanities/Fine arts elective	3.0

Term Credits **15.0-16.0**

Term 9

SOC 364	Computer-Assisted Data Analysis	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
	Communication elective *	3.0
	Culture elective *	3.0
	Free electives	6.0

Term Credits **16.0**

Term 10

COM 360	International Communication	3.0
COM 380	Special Topics in Communication Theory	3.0
COM 390	Global Journalism	3.0
	[WI]	

	Communication elective *	3.0
	Free elective	3.0

Term Credits **15.0**

Term 11

COM 400	Seminar in Communication	3.0
COM 491	Senior Project in Communication I	3.0
PHIL 305	Communication Ethics	3.0
	Free electives	5.0-6.0

Term Credits **14.0-15.0**

Term 12

COM 492	Senior Project in Communication II	3.0
	Free electives	9.0

Term Credits **12.0**

Total Credit: 182.0-188.0

* See degree requirements.

Degree Requirements: Technical & Science Communication (BS)

Students learn to communicate scientific and technical information to various audiences. The program combines courses that develop communication skills with courses that enhance understanding of science and technology.

Students in this concentration find work in a wide range of areas, including providing written documentation for software or hardware products, developing materials for the Web, writing proposals, researching and composing materials to accompany pharmaceutical submissions to the FDA, and writing in the fields of general medicine or science.

General Requirements

ANTH 101	Introduction to Cultural Diversity	3.0
or ANTH 110	Human Past: Anthropology and Prehistoric Archeology	
COM 150	Mass Media and Society	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
PSY 101	General Psychology I	3.0
SOC 101	Introduction to Sociology	3.0
UNIV H101	The Drexel Experience	1.0
CIVC 101	Introduction to Civic Engagement	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
	Political Science (PSCI) elective	4.0
	Economics elective	4.0
	Two History electives	6.0
	English (ENGL) elective (200-level or above)	3.0
	Fine arts elective	3.0
	Philosophy elective	3.0
	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 210	Theory and Models of Communication	3.0
COM 400	Seminar in Communication	3.0
SOC 260 [WI]	Classical Social Theory	3.0
Methods Sequence		
COM 220	Qualitative Research Methods	3.0
SOC 250	Research Methods I	3.0
SOC 364	Computer-Assisted Data Analysis	3.0
Additional Core Requirements		
COM 230	Techniques of Speaking	3.0
COM 240	New Technologies In Communication	3.0
COM 380	Special Topics in Communication Theory	3.0
COM 491	Senior Project in Communication I	3.0
COM 492	Senior Project in Communication II	3.0
PHIL 305	Communication Ethics	3.0
Technical and Science Concentration Requirements		
COM 280	Public Relations Principles and Theory	3.0
COM 310 [WI]	Technical Communication	3.0
COM 320 [WI]	Science Writing	3.0
COM 335	Electronic Publishing	3.0
COM 340	Desktop Publishing	3.0
COM 350 [WI]	Message Design and Evaluation	3.0
COM 420	Technical Editing	3.0
Select one of the following:		3.0
LING 101	Introduction to Linguistics	
LING 102	Language and Society	
Select one of the following:		3.0
HIST 280	History of Science: Ancient to Medieval	
HIST 281	History of Science: Enlightenment to Modernity	
HIST 285	Technology in Historical Perspective	
Select one of the following:		3.0
ENGL 300 [WI]	Literature & Science	

ENGL 302	Environmental Literature	
PHIL 361	Philosophy of Science	
Select one of the following:		3.0
PSY 330	Cognitive Psychology	
PSY 337	Human-Computer Interaction	
Culture and Communication electives		
Communication Electives (Any four courses with a COM rubric at the 200-level or higher)		12.0
Culture electives (Any two courses with a SOC, ANTH, or CJ rubric. At least one course must be at the 200-level or higher.)		6.0
Free electives		29.0
Additional Electives		
Total Credits		182.0

Sample Plan of Study

Technical and Science Communication (BS)

Term 1		Credits
COM 101	Human Communication	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
SOC 101	Introduction to Sociology	3.0
UNIV H101	The Drexel Experience	1.0
MATH 121 or 101	Calculus I Introduction to Analysis I	4.0
Term Credits		14.0
Term 2		
COM 150	Mass Media and Society	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
PSY 101	General Psychology I	3.0
MATH 122 or 102	Calculus II Introduction to Analysis II	4.0
CIVC 101	Introduction to Civic Engagement	1.0
History elective		3.0
Term Credits		17.0
Term 3		
COM 280	Public Relations Principles and Theory	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
ANTH 110 or 101	Human Past: Anthropology and Prehistoric Archeology Introduction to Cultural Diversity	3.0
Political Science (PSCI) elective		4.0
Fine arts elective		3.0
Term Credits		16.0
Term 4		
COM 210	Theory and Models of Communication	3.0
COM 230	Techniques of Speaking	3.0
Select one of the following:		4.0
BIO 107	Cells, Genetics & Physiology (must also register for BIO 108 Lab)	
PHYS 103	General Physics I	

CHEM 111 General Chemistry I		
Philosophy (PHIL) elective	3.0	
History elective	3.0	
Term Credits	16.0	
Term 5		
COM 220 Qualitative Research Methods	3.0	
COM 240 New Technologies In Communication	3.0	
SOC 260 [WI] Classical Social Theory	3.0	
Select one of the following:	3.0	
ENGL 300 Literature & Science [WI]		
ENGL 302 Environmental Literature		
PHIL 361 Philosophy of Science		
Select one of the following:	4.0	
BIO 109 Biological Diversity, Ecology & Evolution (must also register for BIO 110 Lab)		
CHEM 112 General Chemistry II		
PHYS 104 General Physics II		
Term Credits	16.0	
Term 6		
COM 310 Technical Communication [WI]	3.0	
COM 335 Electronic Publishing	3.0	
Economics (ECON) elective	4.0	
Culture elective *	3.0	
English (ENGL) elective	3.0	
Term Credits	16.0	
Term 7		
COM 320 Science Writing [WI]	3.0	
COM 340 Desktop Publishing	3.0	
Communication elective *	3.0	
Free electives	6.0	
Term Credits	15.0	
Term 8		
COM 420 Technical Editing	3.0	
UNIV H201 Looking Forward: Academics and Careers	1.0	
SOC 250 Research Methods I	3.0	
LING 101 Introduction to Linguistics or 102 Language and Society	3.0	
Culture elective *	3.0	
Free elective	3.0	
Term Credits	16.0	
Term 9		
COM 350 Message Design and Evaluation [WI]	3.0	
SOC 364 Computer-Assisted Data Analysis	3.0	
Select one of the following:	3.0	
HIST 280 History of Science: Ancient to Medieval		
HIST 281 History of Science: Enlightenment to Modernity		
HIST 285 Technology in Historical Perspective		
Communication elective	3.0	

Free elective		3.0
Term Credits		15.0
Term 10		
COM 380 Special Topics in Communication Theory		3.0
PSY 337 Human-Computer Interaction or 330 Cognitive Psychology		3.0
Communication elective *		3.0
Free electives		5.0-6.0
Term Credits		14.0-15.0
Term 11		
COM 400 Seminar in Communication		3.0
COM 491 Senior Project in Communication I		3.0
PHIL 305 Communication Ethics		3.0
Communication elective *		3.0
Free elective		3.0
Term Credits		15.0
Term 12		
COM 492 Senior Project in Communication II		3.0
Free electives		9.0
Term Credits		12.0

Total Credit: 182.0-183.0

* See degree requirements.

Co-op/Career Opportunities

Corporate and Public Relations

Graduates with a concentration in corporate and 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 the graduates to find administrative positions in various business areas with an indirect relationship to corporate communication such as marketing, sales, human resources consulting, or publishing.

Although graduate study is not necessary for those who pursue careers in corporate communication, 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 Corporate and 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 past 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

Journalism students pursue degrees in journalism and news. Many communication graduates also go on to law school, to business school for an MBA, or to graduate school. Graduates of this program are also in demand by news and information services as they expand their global reach.

Sample journalism Co-op Experiences

- *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)

Sample Journalism Senior Projects

- Content analysis of *New York Times* coverage of Rwanda tragedy
- Creation of <http://www.abinka.org>, a fully realized webzine

Technical and Science Communication

Students who study technical and science communication are prepared for a variety of career options. Currently there is a shortage of people qualified to write about the technology. Many students become technical writers and editors who produce manuals and reports about high-technology products and services. Many students go on to write specifications and in-house organs for business, industry, and government. Other students conduct and interpret surveys for business. Many students quickly rise to managerial and executive positions, in which they participate in the research and development of new products. Some students become science writers for newspapers.

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.

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

Minor in Communication

The minor in communication is a 24.0 credit curriculum designed to familiarize students with communication theory while providing training in print and electronic communication skills. The minor can provide a strong complement for majors that emphasize presentations, interpersonal skills, publicity, and marketing. Students minoring in communication can focus on corporate and public relations, journalism, technical and science communication or environmental communication.

Finally, students complete three additional electives from the area that fits 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 210	Theory and Models of Communication	3.0
COM 380	Special Topics in Communication Theory	3.0
Select one of the following:		3.0

COM 101 Human Communication

COM 111 Principles of Communication

Focus Areas 6.0

Select one of the following areas of focus (2 courses):

Journalism

COM 260 [WI] Fundamentals of Journalism

Select one of the following:

COM 300 [WI] On-line Journalism

COM 315 Investigative Journalism

COM 390 [WI] Global Journalism

Corporate and Public Relations

COM 280 Public Relations Principles and Theory

Select one of the following:

COM 270 [WI] Business Communication

COM 282 [WI] Public Relations Writing

COM 284 Public Relations Research, Measurement and Evaluation

Technical and Science Communication

COM 310 [WI] Technical Communication

Select one of the following:

COM 320 [WI] Science Writing

COM 375 [WI] Grant Writing

Environmental Communication

COM 317 [WI] Environmental Communication

Select one of the following:

COM 316 Campaigns for Health & Environment

COM 318 Film, Celebrity and the Environmental Movement

Three Additional Courses

Three Communication (COM) or Linguistics (LING) Electives 9.0

Total Credits 24.0

Culture and Communication Faculty

Ronald Bishop, III, PhD (*Temple University*). 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*) *Coordinator of the Publication Management Program*. Instructor. Publishing, electronic publishing, publishing and communications, publishing and mass-media.

Robert J. Brulle, PhD (*George Washington University*). Professor. Environmental policy and politics, critical theory, marine risk, social movements, environmental sociology.

Karen Cristiano, PhD (*Temple University*). Associate Teaching Professor. Journalism, medical writing, feature writing, copy editing, mass media and society.

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

Daniela De Pau, PhD (*University of Illinois at Urbana-Champaign*). Assistant Teaching Professor. Italian cinema, relationship between literature, cinema and other arts, traveling literature, women writers, the tradition of the Comic and the tradition of the Fantastic, autobiography, politics of immigration, cultural identity in contemporary Italy.

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*). 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.

Paul Evangelista, PhD (*Temple University*). Assistant Teaching Professor. Public relations, communication theory, new technologies in communication (classroom and online); business communication.

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

Alexander Friedlander, PhD (*Carnegie Mellon University*) Associate Dean, *College of Arts and Sciences*. Associate Professor. Rhetorical theory and practice, document design, writing and technology.

Anthony Glascock, PhD (*University of Pittsburgh*) Coordinator of the *Anthropology Program*. Professor. Aging and health, definitions of functionality and impairment, technology and aging, social organization, Ireland, East Africa.

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

Julia Hall, PhD (*University of Pennsylvania*). Professor. Criminal justice and juvenile justice reform, including community based alternatives to incarceration, correctional education and programming, reentry and reintegration, restorative justice, and issues relating to special needs offenders, including the el

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

Barbara Hornum, PhD (*Bryn Mawr College*) Director of *Center for Academic Excellence (DCAE)*. Associate Professor. Comparative gerontology, planned communities, continuing care communities, retirement, faculty development.

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

Frank Kelley, PhD (*Temple University*). Associate Teaching Professor. Corporate university systems online, power structure of media enterprises, public relations, event planning.

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.

David Kutzik, PhD (*Temple University*) Coordinator of the *Sociology Program*. Professor. Sociology and philosophy of science; applied gerontological research; political economy of health care; microprocessor-based assistive technologies to improve case management and increase independent living among frail populations.

Brent Luvaas, PhD (*UCLA*). Assistant Professor. DIY and independent media production; transnational consumer culture; popular music; new media and mediated subjectivities; youth culture in the US and Indonesia.

Joanna Lyskowicz, MA (*UAM Poznan, Poland*). Instructor. Comparative linguistics, translation, business Spanish, medical Spanish, modern Spanish literature, XXth cent. Spanish poetry, magical realism in Latin American literature.

Diamantino Machado, PhD (*Temple University*). Teaching Professor. Globalization, political economy, political sociology, philosophy of social science, postmodernism and social reflection.

Maria delaluz Matus-Mendoza, PhD (*Temple University*). 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.

Jack Maxwell, MS (*Saint Joseph's University*). Teaching Professor. Criminal investigations, policing, police administration, domestic violence.

Jordan McClain, PhD (*Temple University*). Assistant Teaching Professor. Media framing and music journalism; relationship between television and music; American popular culture; celebrity, consumerism, and consumer behavior; branding, brand positioning, and advertising criticism.

Margaret McClure, PhD (*University of California at Berkeley*). Assistant Teaching Professor. Research methods, sociology of the family, deviance, military sociology.

Usha Menon, PhD (*University of Chicago*). Associate 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.

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

Anne-Marie Obajtek-Kirkwood, PhD (*University of Pennsylvania*). Associate Professor. French and francophone 20th and 21st century literature, culture and film. Representations of the Occupation (WWII); war; minorities in France; autobiography; feminist issues.

Rakhmiel Peltz, PhD (*Columbia University, Linguistics; University of Pennsylvania, Biological Sciences*) Director of *Judaic Studies Program*. Professor. Sociolinguistics, ethnography of communication, social history of Yiddish language and culture, Yiddish culture of Eastern Europe, language planning, language and ethnic identity, language and group memory, aging and ethnicity, history of urban neighbors.

Douglas V. Porpora, PhD (*Temple University*). Professor. International political economy, culture, social theory, and philosophy of social science.

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.

Devon Powers, PhD (*New York University*). Assistant Professor. Popular music, cultural intermediaries, promotional culture, 20th-century history, journalism studies.

Rachel R. Reynolds, PhD (*University of Illinois at Chicago*). Associate Professor. Sociolinguistics, ethnography of communication, intercultural communication, globalization and the rhetoric of community, political economy of immigration, race and ethnicity, new African immigrants in the United States, Igbo studies.

Cynthia Reed Rickards, MS (*St. Joseph's University*) *Criminal Justice Program*. Assistant Teaching Professor. On-line pedagogy; service-learning pedagogy; juvenile justice; domestic violence.

David Ridgway, MS (*St. Joseph's University*). Instructor. Deviant behaviors, social problems.

Rosemary Rys, MA (*Glassboro State College (now Rowan University)*). Instructor. Public relations and marketing.

Simone Schlichting-Artur, EdD (*University of Pennsylvania*) *Assistant Department Head, Culture and Communication*. 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.

Mimi Sheller, PhD (*New School for Social Research*) *Director of the Mobilities Research and Policy Center at Drexel University*. 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.

Natsumi Shor Assistant Teaching Professor. Business and professional Japanese; Japanese film and culture; interrelation between Japanese language to the nation's culture and thought.

Wesley Shumar, PhD (*Temple University*) *Department Head, Culture and Communication*. Professor. Ethnography of cyberspace, online learning communities, political economy of higher education, globalization, activity theory, semiotics, critical realism, psychoanalysis, identity and the self.

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.

Lawrence Souder, PhD (*Temple University*). Associate Teaching Professor. Science and technical writing, communication ethics.

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

Judith Storniolo, PhD (*University of Pennsylvania*). Teaching Professor. Historical and comparative linguistics, Mesoamerican languages and culture, applied anthropology, public policy, oral traditions and narratives,

ideology and ritual, Mesoamerican ethnohistory; and pre-Columbian literature.

Asta Zelenkauskaite, PhD (*Indiana University*). Assistant 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.

Interdepartmental Faculty

Tony H. Grubestic, PhD (*The Ohio State University*) *Director of the Center for Spatial Analytics and Geocomputation (CSAG)*. Professor. Geographic information science, spatial analysis, development, telecommunication policy, location modeling.

Michelle Sahl, PhD, MEd, MBA, MBE (*The University of the Sciences in Philadelphia*). Associate Teaching Professor. Health management and policy: management and leadership of health services organizations, urban health, and the history of health care systems.

Minor in Computer Crime

Computers have created new opportunities for crime and have affected the requisite capacity to commit criminal acts. The minor in computer crime provides students with an overview of the behavioral, legal, technical, and administrative issues faced by the criminal justice system and security communities in addressing crime involving computers and related networking technologies. The curriculum exposes students to state-of-the-art solutions used within the public and private sectors to respond to and prevent computer crime

Required Courses

CJ 204	Criminology	3.0
CJ 206	Criminal Justice	3.0
CJ 274	Sex, Violence & Crime on the Internet	3.0
CJ 276	Introduction to Computer Crime	3.0
CJ 365	Computer Investigation and the Law	3.0
CJ 377	Intellectual Property Theft in the Digital Age	3.0

Additional Elective Courses

Select two of the following:		6.0
CJ 265	Criminal Investigation	
CJ 266	Crime Prevention Planning	
CJ 267	Introduction to Security Studies	
CJ 273	Surveillance, Technology and the Law	
CJ 362	Gender, Crime and Justice	
CJ 375	Criminal Procedure	
CJ 380	Special Topics	

Total Credits **24.0**

Criminal Justice

Bachelor of Science Degree: 182.0 quarter credits

About the Program

Note: Effective Fall 2014, students are no longer being accepted into this program. Please see Criminology and Justice Studies .

Students majoring in criminal justice learn about the most recent scientific developments and the latest technologies relevant to criminal justice. Internships and co-ops provide opportunities for students to synthesize academic learning with direct experience in the criminal justice system.

Issues of crime and justice affect every individual at some point in their lives if only as tax-paying citizens and voters. Criminal justice legislation, policy and decision-making and matters of community safety and well-being require well-educated professionals to administer, legislate, communicate, and implement the work of the criminal justice system. Students in Drexel's criminal justice major will be well prepared to assume these roles and responsibilities.

About the Curriculum

On completion of the bachelor's degree, the required courses provide the essential foundation for mid-level employment in the field of criminal justice or for further study in various areas of criminal justice and the law. Students will acquire theoretical and methodological skills as well as courses in written and oral communication so necessary for professional careers in this field. The students majoring in criminal justice will also have a robust foundation in statistics, and computer applications. Additional required courses focus on the areas of forensic sciences, law and political and social sciences.

Program Goals

The goals for the criminal justice program include the following:

- To provide excellent, cutting edge preparation for students planning to enter graduate study of criminal justice, law and law-related programs.
- To prepare students for upper level employment in the criminal justice system at local, state and federal levels.
- To communicate an understanding of crime, criminal behavior and the criminal justice system essential for aware citizens, as voters, taxpayers, planners and decision-makers.

Additional Information

For more information specific to the field of criminal justice, contact:

Robert Kane, PhD
Professor of Criminal Justice
Culture and Communication
robert.j.kane@drexel.edu

For additional information about the BS in Criminal Justice, please visit the Culture and Communication Department's Criminal Justice (<http://www.drexel.edu/culturecomm/academics/undergraduate/criminaljustice>) page.

Visit the Drexel Steinbright Career Development Center (<http://www.drexel.edu/scdc>) page for more detailed information on opportunities.

Degree Requirements

CJ 206	Criminal Justice (This course becomes CJS100)	3.0
CJ 204	Criminology (This course becomes CJS200)	3.0
CJ 375	Criminal Procedure	3.0
CJ 290	Crime and Public Policy	3.0
CJS 260	Justice in Our Community (New course.) community-based learning course	4.0

CJ 376	Sentencing: The History, Necessity and Morality of Punishment in America (New title: History and Philosophy of the Criminal Sanction)	3.0
PHIL 330	Ethical Issues in Criminal Justice	3.0
CJ 400 [WI]	Capstone in Criminology and Justice Policy (This title changes to "Capstone in Criminology and Justice Policy")	3.0

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
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
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	2.0
Fine Arts Elective		3.0
History Elective		3.0
English Elective (any ENGL course over 200-level)		3.0
Math Sequences		8.0

Select one of the following:

Analysis Sequence

MATH 101 Introduction to Analysis I

MATH 102 Introduction to Analysis II

Calculus Sequence

MATH 121 Calculus I

MATH 122 Calculus II

Science Sequence 8.0

Select one of the following:

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

Criminal Justice Core Requirements

Justice Sequence

BLAW 342	Criminal Law	4.0
CJ 204	Criminology	3.0
CJ 206	Criminal Justice	3.0
CJ 276	Introduction to Computer Crime	3.0
CJ 277	Introduction to Correctional Practices	3.0
CJ 278	Introduction to Law Enforcement	3.0
CJ 360	Juvenile Justice	3.0
CJ 374 [WI]	Restorative Justice	3.0

CJ 375	Criminal Procedure	3.0
CJ 376	Sentencing: The History, Necessity and Morality of Punishment in America	3.0
CJ 390 [WI]	CO-OP Integration in Criminology and Justice Studies	0.0-6.0
CJ 400 [WI]	Capstone in Criminology and Justice Policy	3.0
PHIL 330	Ethical Issues in Criminal Justice	3.0

Writing/Communication Sequence

COM 230	Techniques of Speaking	3.0
COM 375 [WI]	Grant Writing	3.0

Theory Sequence

SOC 260 [WI]	Classical Social Theory	3.0
SOC 460 [WI]	Contemporary Social Theory	3.0
PSCI 329	Theories of Justice	3.0

Methods Sequence

COM 220	Qualitative Research Methods	3.0
SOC 250	Research Methods I	3.0
SOC 364	Computer-Assisted Data Analysis	3.0

Criminal Justice Specialization Courses

Select eight of the following: 24.0-25.0

Forensics

CJ 265	Criminal Investigation
CJ 369	Forensic Science Survey Course
CJ 378	Science of Forensic Science
CJ 379	Forensic DNA Analysis
PSY 370	Forensic Psychology

Cybercrime

CJ 273	Surveillance, Technology and the Law
CJ 274	Sex, Violence & Crime on the Internet
CJ 377	Intellectual Property Theft in the Digital Age

Crime and Procedures

CJ 266	Crime Prevention Planning
CJ 267	Introduction to Security Studies
CJ 275	Issues in Domestic Violence
CJ 280	Communities and Crime
CJ 282	Community Policing
CJ 289	Terrorism
CJ 290	Crime and Public Policy
CJ 372	Death Penalty - An American Dilemma
CJ 373	Environmental Crimes
BLAW 348	White Collar Crime
PSCI 220	Constitutional Law I
PSCI 365	Politics, Law, & Justice

Other Social Science Electives

Select four of the following: 12.0

SOC 115	Social Problems
SOC 120	Sociology of the Family
SOC 220	Wealth and Power
SOC 240	Urban Sociology
SOC 320	Sociology of Deviant Behavior
CJ 380	Special Topics
CJ 399	Independent Study

SOC 380	Special Topics in Sociology
PSCI 363	Constitutional Law II
PSCI 366	Supreme Court and American Politics
Select one of the following: 3.0	
ANTH 312	Approaches to Intercultural Behavior
COM 345	Intercultural Communication
SOC 210	Race and Ethnic Relations
Electives	
Free Electives	19.0-25.0
Total Credits	182.0

Note: Effective Fall 2014, students are no longer being accepted into this program. Please see Criminology and Justice Studies.

Sample Plan of Study

Term 1		Credits
CJ 206	Criminal Justice	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
SOC 101	Introduction to Sociology	3.0
CHEM 111 or BIO 107	General Chemistry I Cells, Genetics & Physiology	4.0
UNIV H101	The Drexel Experience	1.0
Term Credits		14.0
Term 2		
COM 150	Mass Media and Society	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
PHIL 101	Introduction to Western Philosophy	3.0
SOC 115	Social Problems	3.0
CHEM 112 or BIO 109	General Chemistry II Biological Diversity, Ecology & Evolution	4.0
UNIV H101	The Drexel Experience	1.0
Term Credits		17.0
Term 3		
ANTH 101	Introduction to Cultural Diversity	3.0
CJ 204	Criminology	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
PSCI 100	Introduction to Political Science	4.0
SOC 260 [WI]	Classical Social Theory	3.0
Term Credits		16.0
Term 4		
CJ 277	Introduction to Correctional Practices	3.0
COM 220	Qualitative Research Methods	3.0
History Elective		3.0
Criminal Justice Specialization Courses*		6.0
Term Credits		15.0
Term 5		
CJ 278	Introduction to Law Enforcement	3.0
CJ 360	Juvenile Justice	3.0
COM 230	Techniques of Speaking	3.0

SOC 250	Research Methods I	3.0
MATH 121 or 101	Calculus I Introduction to Analysis I	4.0
Term Credits		16.0
Term 6		
CJ 276	Introduction to Computer Crime	3.0
SOC 364	Computer-Assisted Data Analysis	3.0
MATH 122 or 102	Calculus II Introduction to Analysis II	4.0
English (ENGL) Course 200-level or Above		3.0
Other Social Science Elective *		3.0
Term Credits		16.0
Term 7		
CJ 375	Criminal Procedure	3.0
CJ 390 [WI]	CO-OP Integration in Criminology and Justice Studies	3.0
COM 375 [WI]	Grant Writing	3.0
UNIV 101	The Drexel Experience	1.0
Fine Arts Elective		3.0
Free Elective		3.0
Term Credits		16.0
Term 8		
CJ 374 [WI]	Restorative Justice	3.0
PSCI 329	Theories of Justice	3.0
PSY 101	General Psychology I	3.0
SOC 320	Sociology of Deviant Behavior	3.0
Other Social Science Elective *		3.0
Term Credits		15.0
Term 9		
SOC 460 [WI]	Contemporary Social Theory	3.0
Select one of the following:		3.0
ANTH 312	Approaches to Intercultural Behavior	
SOC 210	Race and Ethnic Relations	
COM 345	Intercultural Communication	
Criminal Justice Specialization Courses *		6.0
Free Elective		3.0
Term Credits		15.0
Term 10		
BLAW 342	Criminal Law	4.0
CJ 376	Sentencing: The History, Necessity and Morality of Punishment in America	3.0
PHIL 330	Ethical Issues in Criminal Justice	3.0
Other Social Science Elective *		3.0
Term Credits		13.0
Term 11		
Free Electives		6.0
Criminal Justice Specialization Courses *		9.0
Term Credits		15.0
Term 12		
CJ 400 [WI]	Capstone in Criminology and Justice Policy	3.0

Criminal Justice Specialization Course *	3.0
Free Electives	5.0
Other Social Science Elective *	3.0
Term Credits	
14.0	
Total Credit: 182.0	

* See degree requirements.

Professional Experiences

Students will complete two professional placements. Some placements are paid and others are unpaid. The placements earn students academic credit while providing hands-on learning with criminal 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 interned and later worked full time at the Eastern State Penitentiary Historical Site and Museum. On the state level, interns 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 Dr. Hall in her CJ 206 course. Other students have interned at The Drug Enforcement Agency (DEA), Alcohol, Tobacco & Fire Arms (ATF) and students have interned in the Federal Bureau of Investigation (FBI) Honors Internship Program, a highly selective, nationally competitive program.

Minor in Criminal Justice

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. Students minoring in criminal justice are assumed to have already taken SOC 101 Introduction to Sociology.

Required Courses

CJ 204	Criminology	3.0
CJ 206	Criminal Justice	3.0
CJ 360	Juvenile Justice	3.0
SOC 320	Sociology of Deviant Behavior	3.0

Criminal Justice Elective Courses

Category I

Select one of the following: 3.0

SOC 210	Race and Ethnic Relations
COM 345	Intercultural Communication
or ANTH 312	Approaches to Intercultural Behavior

Category II

Select three of the following: 9.0

CJ 282	Community Policing
CJ 362	Gender, Crime and Justice
CJ 380	Special Topics
COM 355	Ethnography of Communication
COM 365	Journalists, the Courts, and the Law
SOC 115	Social Problems
SOC 120	Sociology of the Family
PSY 150	Introduction to Social Psychology
PSY 240 [WI]	Abnormal Psychology
PSY 370	Forensic Psychology

Total Credits **24.0**

Culture and Communication Faculty

Ronald Bishop, III, PhD (*Temple University*). 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*) *Coordinator of the Publication Management Program*. Instructor. Publishing, electronic publishing, publishing and communications, publishing and mass-media.

Robert J. Brulle, PhD (*George Washington University*). Professor. Environmental policy and politics, critical theory, marine risk, social movements, environmental sociology.

Karen Cristiano, PhD (*Temple University*). Associate Teaching Professor. Journalism, medical writing, feature writing, copy editing, mass media and society.

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

Daniela De Pau, PhD (*University of Illinois at Urbana-Champaign*). Assistant Teaching Professor. Italian cinema, relationship between literature, cinema and other arts, traveling literature, women writers, the tradition of the Comic and the tradition of the Fantastic, autobiography, politics of immigration, cultural identity in contemporary Italy.

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*). 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.

Paul Evangelista, PhD (*Temple University*). Assistant Teaching Professor. Public relations, communication theory, new technologies in communication (classroom and online); business communication.

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

Alexander Friedlander, PhD (*Carnegie Mellon University*) *Associate Dean, College of Arts and Sciences*. Associate Professor. Rhetorical theory and practice, document design, writing and technology.

Anthony Glascock, PhD (*University of Pittsburgh*) *Coordinator of the Anthropology Program*. Professor. Aging and health, definitions of functionality and impairment, technology and aging, social organization, Ireland, East Africa.

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

Julia Hall, PhD (*University of Pennsylvania*). Professor. Criminal justice and juvenile justice reform, including community based alternatives to incarceration, correctional education and programming, reentry and reintegration, restorative justice, and issues relating to special needs offenders, including the el

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

Barbara Hornum, PhD (*Bryn Mawr College*) *Director of Center for Academic Excellence (DCAE)*. Associate Professor. Comparative gerontology, planned communities, continuing care communities, retirement, faculty development.

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

Frank Kelley, PhD (*Temple University*). Associate Teaching Professor. Corporate university systems online, power structure of media enterprises, public relations, event planning.

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.

David Kutzik, PhD (*Temple University*) *Coordinator of the Sociology Program*. Professor. Sociology and philosophy of science; applied gerontological research; political economy of health care; microprocessor-based assistive technologies to improve case management and increase independent living among frail populations.

Brent Luvaas, PhD (*UCLA*). Assistant Professor. DIY and independent media production; transnational consumer culture; popular music; new media and mediated subjectivities; youth culture in the US and Indonesia.

Joanna Lyskovicz, MA (*UAM Poznan, Poland*). Instructor. Comparative linguistics, translation, business Spanish, medical Spanish, modern Spanish literature, XXth cent. Spanish poetry, magical realism in Latin American literature.

Diamantino Machado, PhD (*Temple University*). Teaching Professor. Globalization, political economy, political sociology, philosophy of social science, postmodernism and social reflection.

Maria delaluz Matus-Mendoza, PhD (*Temple University*). 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.

Jack Maxwell, MS (*Saint Joseph's University*). Teaching Professor. Criminal investigations, policing, police administration, domestic violence.

Jordan McClain, PhD (*Temple University*). Assistant Teaching Professor. Media framing and music journalism; relationship between television and music; American popular culture; celebrity, consumerism, and consumer behavior; branding, brand positioning, and advertising criticism.

Margaret McClure, PhD (*University of California at Berkeley*). Assistant Teaching Professor. Research methods, sociology of the family, deviance, military sociology.

Usha Menon, PhD (*University of Chicago*). Associate 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.

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

Anne-Marie Obajtek-Kirkwood, PhD (*University of Pennsylvania*). Associate Professor. French and francophone 20th and 21st century literature, culture and film. Representations of the Occupation (WWII); war; minorities in France; autobiography; feminist issues.

Rakhmiel Peltz, PhD (*Columbia University, Linguistics; University of Pennsylvania, Biological Sciences*) Director of Judaic Studies Program. Professor. Sociolinguistics, ethnography of communication, social history of Yiddish language and culture, Yiddish culture of Eastern Europe, language planning, language and ethnic identity, language and group memory, aging and ethnicity, history of urban neighbors.

Douglas V. Porpora, PhD (*Temple University*). Professor. International political economy, culture, social theory, and philosophy of social science.

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.

Devon Powers, PhD (*New York University*). Assistant Professor. Popular music, cultural intermediaries, promotional culture, 20th-century history, journalism studies.

Rachel R. Reynolds, PhD (*University of Illinois at Chicago*). Associate Professor. Sociolinguistics, ethnography of communication, intercultural communication, globalization and the rhetoric of community, political economy of immigration, race and ethnicity, new African immigrants in the United States, Igbo studies.

Cynthia Reed Rickards, MS (*St. Joseph's University*) *Criminal Justice Program*. Assistant Teaching Professor. On-line pedagogy; service-learning pedagogy; juvenile justice; domestic violence.

David Ridgway, MS (*St. Joseph's University*). Instructor. Deviant behaviors, social problems.

Rosemary Rys, MA (*Glassboro State College (now Rowan University)*). Instructor. Public relations and marketing.

Simone Schlichting-Artur, EdD (*University of Pennsylvania*) *Assistant Department Head, Culture and Communication*. 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.

Mimi Sheller, PhD (*New School for Social Research*) *Director of the Mobilities Research and Policy Center at Drexel University*. 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.

Natsumi Shor Assistant Teaching Professor. Business and professional Japanese; Japanese film and culture; interrelation between Japanese language to the nation's culture and thought.

Wesley Shumar, PhD (*Temple University*) *Department Head, Culture and Communication*. Professor. Ethnography of cyberspace, online learning communities, political economy of higher education, globalization, activity theory, semiotics, critical realism, psychoanalysis, identity and the self.

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.

Lawrence Souder, PhD (*Temple University*). Associate Teaching Professor. Science and technical writing, communication ethics.

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

Judith Storniolo, PhD (*University of Pennsylvania*). Teaching Professor. Historical and comparative linguistics, Mesoamerican languages and culture, applied anthropology, public policy, oral traditions and narratives, ideology and ritual, Mesoamerican ethnohistory; and pre-Columbian literature.

Asta Zelenkauskaitė, PhD (*Indiana University*). Assistant 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.

Interdepartmental Faculty

Tony H. Grubestic, PhD (*The Ohio State University*) *Director of the Center for Spatial Analytics and Geocomputation (CSAG)*. Professor. Geographic information science, spatial analysis, development, telecommunication policy, location modeling.

Michelle Sahl, PhD, MEd, MBA, MBE (*The University of the Sciences in Philadelphia*). Associate Teaching Professor. Health management and policy: management and leadership of health services organizations, urban health, and the history of health care systems.

Courses

CJ 204 Criminology 3.0 Credits

Criminology is the scientific study of crime, criminal behavior and societal responses to crime and to crime victims. Students will study theories of crime causation, crime types, ethics of research, data collection and methods of crime prevention and control. Issues such as capital punishment, gun control and restorative justice will be debated.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CJ 206 Criminal Justice 3.0 Credits

Criminal Justice is the study of the agencies that apprehend, adjudicate, sanction, and treat criminal offenders. Students will study the history, policies, procedures and issues regarding these agencies. Court and prison visits will give students an opportunity to augment academic knowledge with direct observation.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CJ 265 Criminal Investigation 3.0 Credits

The initial crime scene investigation can make or break subsequent crime solving and conviction of offenders. What does one look for? Who has responsibility for the collection of evidence and the resulting chain of custody? Who has authority in cases that involve several states and federal law enforcement?.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CJ 266 Crime Prevention Planning 3.0 Credits

This course examines the current literature on effective crime prevention programming and planning. Students will be expected to be able to analyze physical and social risk factors for criminal events. Students will also explore methodologies for strategic planning and will use this knowledge to develop a crime prevention plan for the campus or a community.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CJ 267 Introduction to Security Studies 3.0 Credits

This course will explore the historical evolution of private security, public policy issues related to privatization of criminal justice systems, legal issues of security and analytic models for security vulnerability assessments. A final project will include an analytically and theoretically sound security assessment of a building or a facility.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CJ 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

CJ 274 Sex, Violence & Crime on the Internet 3.0 Credits

This course explores how offenders are adopting computers to commit traditional crimes in a hi-tech manner. Specific attention will be paid to how the Internet has affected the structure of hate groups and the child pornography and sexual predator subcultures. Cyber-stalking and online harassment will also be examined.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CJ 275 Issues in Domestic Violence 3.0 Credits

Domestic Violence is a major public health problem. This course will describe DV in the context of multiple response systems including health care, police, advocacy, and criminal justice. We will explore how DV affects men, women and children and examine societal conditions that allow DV to occur and continue.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CJ 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 cyber-fraud. Issues encountered when enforcing 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

CJ 277 Introduction to Correctional Practices 3.0 Credits

This course will provide insight into corrections through theory, laws and contemporary practices, facilities management, reentry and alternatives to incarceration. Corrections involve the 'treatment and rehabilitation of offenders through a program involving penal custody, parole, and probation' (Merriam-Webster). This course will include site visits, guest lecturers and case analysis.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CJ 278 Introduction to Law Enforcement 3.0 Credits

Law enforcement, generally the first point of contact, is the largest of the three Criminal Justice agencies. A solid understanding of the missions, strategies and controversies of policing is essential to citizens and Criminal Justice students. The reality is more complicated than preventing crimes and catching criminals.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CJ 280 Communities and Crime 3.0 Credits

This course is an examination of classical and contemporary theories of the social ecology of communities and how this social ecology relates to crime. Further, we will explore the impact of community development activities on crime outcomes in neighborhoods. We will examine the importance of race and class in forging effective community based development models. Lastly, we will examine specific community based solutions to crime and disorder problems.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CJ 282 Community Policing 3.0 Credits

Community Policing, a new law enforcement philosophy, involves partnering with communities to identify and solve problems proactively. We will examine the multi-dimensional strategies necessary for Community Policing to be effective and for it to be significantly more satisfactory for the community policed and those policing.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CJ 289 Terrorism 3.0 Credits

This course will view terrorism from a historical perspective. Various forms of governments and social constructs will be scrutinized as to their impact on human rights issues. Students will study the causes and consequences of domestic and international terrorist activity and discuss the delicate balance between security and freedom.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CJ 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

CJ 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

CJ 362 Gender, Crime and Justice 3.0 Credits

Course examines the different experiences and needs of female criminal justice professionals, crime victims and offenders using field trips, guest experts, videotape, new theories, legislation, policies and discussions.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: (CJS 101 [Min Grade: C] or CJ 206 [Min Grade: C]) or (CJS 204 [Min Grade: C] or CJ 204 [Min Grade: C])

CJ 364 Community Corrections 3.0 Credits

Costly, unnecessary and impractical incarceration of every offender emphasizes the importance of community-based alternatives which are more effective and less expensive. Course includes field trips, guest experts, and discussion.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CJ 365 Computer Investigation 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

Prerequisites: CJ 274 [Min Grade: D] or CJ 276 [Min Grade: D]

CJ 369 Forensic Science Survey Course 3.0 Credits

This course will survey various forensic disciplines with emphasis on their role within the criminal justice system. The course will familiarize students with methods and techniques currently employed in the crime scene processing, drug identifications, trace evidence, bloodstain pattern analysis, entomology, DNA, other disciplines, ethics, and expert testimony. The course is taught by trained in-service forensic scientists.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CJ 372 Death Penalty - An American Dilemma 3.0 Credits

Capital Punishment is a complex and controversial issue. Opinions about the death penalty are rarely grounded in hard evidence. This course will examine the history of the use of capital punishment in America: the case law and the issues which rise from the use of the Ultimate Sanction.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CJ 373 Environmental Crimes 3.0 Credits

An examination of the criminal consequences of the violation of laws, regulations and policies governing clean water, air and toxic substances. Analysis of case studies from a variety of perspectives including crime scene investigations and potential terrorism.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

CJ 374 [WI] 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. Programs have developed worldwide often sponsored by governments, others by non-profits, to handle both juvenile and adult criminal offences more effectively. This is a writing intensive course.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: CJ 206 [Min Grade: D]

CJ 375 Criminal Procedure 3.0 Credits

Understanding the historical and contemporary significance of the Bill of Rights especially the 4th, 5th, and 6th amendments is critically important in the practice of law and law enforcement. Real life conflicts in the application of constitutional criminal procedure and tensions between due process and crime control will be discussed.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: CJ 206 [Min Grade: D]

CJ 376 Sentencing: The History, Necessity and Morality of Punishment in America 3.0 Credits

The course is an exploration of punishment, its various philosophies, theories and approaches. The costs and outcomes of incarceration as well as alternatives will be examined as well as disparities regarding age, gender, race in our sentencing. A review of the ultimate sanction, the death penalty will complete the course.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: CJ 206 [Min Grade: C]

CJ 377 Intellectual Property Theft in the Digital Age 3.0 Credits

This seminar focuses on the changing nature of intellectual property theft in the Digital Age. Attention will be paid to legislative solutions for protecting intellectual property 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

Restrictions: Cannot enroll if classification is Freshman

CJ 378 Science of Forensic Science 3.0 Credits

Students will study actual casework to learn how to apply scientific method to evidence analysis and translation of results to criminal court hearings and trials. In this ONLINE course students will play the virtual role of analyst, gathering crime scene evidence and presenting it at trial.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 102 [Min Grade: D] or CHEM 101 [Min Grade: D] or BIO 151 [Min Grade: D] or CHEM 151 [Min Grade: D] or CHEM 111 [Min Grade: D]

CJ 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

Prerequisites: BIO 104 [Min Grade: D] or CHEM 102 [Min Grade: D] or CHEM 112 [Min Grade: D]

CJ 380 Special Topics 3.0 Credits

This course will explore current issues and interests in Criminal Justice. The topic will vary each term.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

CJ 390 [WI] Internships in Criminal Justice 3.0-6.0 Credits

Internships provide opportunities for students to clarify career interests; synthesize prior academic knowledge with direct experience; and sharpen critical thinking, analytical, and observational skills. Direct participation in the criminal justice system allow for testing theory with practice. Learning from and networking with professionals in the field is enhanced. This is a writing intensive course.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 1 times for 6 credits

CJ 399 Independent Study 0.5-12.0 Credits

Provides a course of independent study in Criminal Justice. 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

CJ 400 [WI] Critical Issues in Criminal Justice 3.0 Credits

The capstone course will be open only to Criminal Justice Seniors. It will serve as an opportunity for them to demonstrate their cumulative learning to the major by looking on the most challenging issues in the field. Students, divided into groups, will research the topics, draft a report and present and defend it before an audience of Criminal Justice students. The knowledge and skills obtained through four years as a Criminal Justice major will be reflected in their work. This course will be a writing intensive course as multiple drafts of their thesis will be reviewed and critiqued before the final report is written and accepted. (Topic will reflect contemporary issues and one subject to choose.)

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if major is CJ and classification is Senior.

Criminology and Justice Studies

Bachelor of Science: 183.0 - 198.0 quarter credits

About the Program

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 do so-called Three Strikes laws typically influence the decisions of judges at sentencing? 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? Finally, how 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? Drexel University's Program of Criminology and Justice Studies offers a rich educational experience that emphasizes justice and criminological theory, and translating concepts into practice. With its three thematic concentrations -- one in Criminology and Justice Policy, one in Justice Informatics, and one in Criminal Justice -- the Program in Criminology and Justice Studies provides all students with foundational knowledge and tools of the discipline, while allowing them to specialize in different areas of interest within the discipline.

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

Degree Concentrations

- Criminology & Justice Policy
- Justice Informatics
- Criminal Justice

Minor in Ecology

The minor in ecology meets the needs of engineering, science, arts, applied arts, information, and business students interested in environmental science. Prior to taking ENV5 230 General Ecology,

students are minimally expected to have had one term to a year of both general biology and general chemistry.

Required Courses

ENVS 212	Evolution	4.0
ENVS 230	General Ecology	3.0
ENVS 260	Environmental Science and Society	3.0
ENVS 284 [WI]	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 328	Conservation Biology	3.0
Environmental Science elective		3.0-4.0

Total Credits **26.0-27.0**

English

Bachelor of Arts Degree: 182.0 quarter credits

About the Program

Specifically designed to engage students in critical thinking and applied writing skills, the English major offers a wide-ranging curriculum on British, American and World literatures and stresses the cultural, historical and political contexts that shape and affect literary production. The Department of English and Philosophy (<http://www.drexel.edu/engphil>) also offers variety of courses on periods and genres; creative writing; and the relationship between literature and the visual arts, science and technology.

Students develop solid techniques in critical inquiry as well as in writing, literary, and reading skills. Implicit in our undertaking is the leadership role of our department in the formulation and discussion of such broad theoretical and practical questions as the following: the connection between oral and written communication skills; analytical, ethical, and critical thinking; questions of value and morality; 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; and the relations between the sexes.

Degree Requirements

University Requirements

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
UNIV H101	The Drexel Experience	3.0
Two Mathematics Courses		6.0-8.0
Two Science Courses		6.0-8.0

Foreign Language Courses

Any two (2) consecutive foreign language courses (completing level 201) 8.0

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: High Renaissance to Modern
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ARTH 103	History of Art: Early to Late Modern
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DANC 201	Dance Appreciation
[WI]	

DANC 210	Introduction to Dance
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DANC 220	History of Dance
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DANC 325	Twentieth Century Dance
[WI]	

FMST 150	American Classic Cinema
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FMST 250	The Documentary Tradition
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FMST 355	Contemporary Cinema
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FMVD 218	Intermediate Cinematography
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MUSC 130	Introduction to Music
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MUSC 231	Music History I
[WI]	

MUSC 232	Music History II
[WI]	

MUSC 236	Rock Music Through the Mid-60s
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MUSC 238	Rock Music Since the Mid-60s
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PHIL 101	Introduction to Western Philosophy
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PHIL 105	Critical Reasoning
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PHIL 211	Metaphysics
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PHIL 221	Epistemology
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PHIL 231	Aesthetics
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PHIL 251	Ethics
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PHTO 110	Photography
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PHTO 115	Photographic Principles
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THTR 115	Theatrical Experience
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THTR 221 [WI]	Theatre History I
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THTR 222 [WI]	Theatre History II
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Social and Behavioral Sciences

Select four of the following: 12.0

ANTH 110	Human Past: Anthropology and Prehistoric Archeology
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ANTH 210	Worldview: Science, Religion and Magic
[WI]	

COM 150	Mass Media and Society
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COM 230	Techniques of Speaking
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HIST 161	Themes in World Civilization I
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HIST 162	Themes in World Civilization II
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HIST 163	Themes in World Civilization III
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PSCI 100	Introduction to Political Science
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PSCI 120	History of Political Thought
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PSY 101	General Psychology I
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PSY 120	Developmental Psychology
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PSY 140	Approaches to Personality
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SOC 101	Introduction to Sociology
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SOC 115	Social Problems
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SOC 120	Sociology of the Family
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International Studies

Select two of the following: 6.0

ANTH 212	Topics in World Ethnography
[WI]	

ANTH 312	Approaches to Intercultural Behavior
COM 360	International Communication
COM 361	International Public Relations
COM 362	International Negotiations
FMST 160	European Cinema
FMST 245	Non-Western Cinema
HIST 209	The United States & Central America: From Monroe Doctrine to Cold War
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
PSCI 150	International Politics
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 215	Anthropology of Gender
COM 345	Intercultural Communication
ENGL 345	American Ethnic Literature
ENGL 350	Jewish Literature and Civilization
ENGL 355	Women and Literature [WI]
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 223	Women and Work in America
HIST 224	Women in American 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 and Ethnic Relations
SOC 330	Developing Nations and the International Division of Labor
WMST 101	Introduction to Women's Studies
WMST 240	Women and Society in a Global Context
WMST 250	African American Herstories

Major Requirements**Foundational and Professional Courses**

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 315 [WI]	Shakespeare	3.0

ENGL 380	Literary Theory	3.0
ENGL 490	Seminar in English and American Literature	4.0
ENGL 492	Seminar in World Literature	4.0
ENGL 499	Senior Project in Literature	4.0

Select three of the following: 9.0

ENGL 200	Classical to Medieval Literature [WI]
ENGL 201	Renaissance to the Enlightenment
ENGL 202	Romanticism to Modernism [WI]
ENGL 203	Post-Colonial Literature I [WI]
ENGL 204	Post-Colonial Literature II
ENGL 207	African American Literature [WI]
ENGL 214	Readings in Fiction
ENGL 215	Readings in Poetry [WI]
ENGL 216	Readings in Drama [WI]

Select three of the following: 9.0

ENGL 310	Period Studies [WI]
ENGL 320	Major Authors [WI]
ENGL 325	Topics in World Literature
ENGL 330	The Bible as Literature
ENGL 335	Mythology

Select three of the following: 9.0

ENGL 305	The Mystery Story [WI]
ENGL 306	Literature of Baseball
ENGL 307	Literature of the Holocausts
ENGL 323	Literature and Other Arts
ENGL 345	American Ethnic Literature
ENGL 350	Jewish Literature and Civilization
ENGL 355	Women and Literature [WI]
ENGL 360	Literature and Society [WI]
ENGL 365	Topics in African American Literature
ENGL 395	Special Studies in Literature [WI]
ENGL 399	Independent Project in Literature
PHIL 381 [WI]	Philosophy in Literature

Creative and Professional Writing

Select five of the following: 15.0

WRIT 306	Writing About the Media
WRIT 310	Literary Editing & Publication
WRIT 312	The Practice of Professional Writing
WRIT 400 [WI]	Writing in Cyberspace
WRIT 405	Internship in Literary Publishing
COM 260 [WI]	Fundamentals of Journalism
COM 300 [WI]	On-line Journalism

COM 310 [WI]	Technical Communication	
COM 315	Investigative Journalism	
COM 335	Electronic Publishing	
COM 340	Desktop Publishing	
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	Writing Fiction	
WRIT 303	Writing Humor and Comedy	
SCRP 270 [WI]	Screenwriting I	
SCRP 275 [WI]	Screenwriting II	
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 280	History of Science: Ancient to Medieval	
HIST 281	History of Science: Enlightenment to Modernity	
HIST 285	Technology in Historical Perspective	
HIST 292	Technology in American Life	
PHIL 311	Computer Ethics	
PHIL 315	Engineering Ethics	
PHIL 341	Philosophy of the Environment	
PHIL 355	Philosophy of Medicine	
PHIL 351	Philosophy of Technology	
PHIL 361	Philosophy of Science	
Electives		
Free Electives		30.0
Total Credits		182.0-186.0

Sample Plan of Study

Term		Credits	
Term 1	ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
	UNIV H101	The Drexel Experience	1.0
	HIST 161	Themes in World Civilization I	3.0
	Math Elective		4.0
	Foreign Language Course (1st consecutive course)		4.0
	Term Credits		15.0
Term 2	ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
	HIST 162	Themes in World Civilization II	3.0
	UNIV H101	The Drexel Experience	2.0
	Foreign Language Course (2nd consecutive course, 201-level)		4.0
	Math Elective		4.0
	Term Credits		16.0

Term 3		
ANTH 101	Introduction to Cultural Diversity	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
MUSC 130	Introduction to Music	3.0
PHIL 101	Introduction to Western Philosophy	3.0
PSY 101	General Psychology I	3.0
Term Credits		15.0

Term 4		
ENGL 205 [WI]	American Literature I	3.0
ENGL 211 [WI]	British Literature I	3.0
PHIL 105	Critical Reasoning	3.0
Social and Behavioral Sciences Elective		3.0
Lab Science Elective		3.0
Term Credits		15.0

Term 5		
ENGL 206 [WI]	American Literature II	3.0
ENGL 212 [WI]	British Literature II	3.0
International Studies Elective		3.0
Lab Science Elective		3.0
Diversity Studies Elective		3.0
Term Credits		15.0

Term 6		
COM 260 [WI]	Fundamentals of Journalism	3.0
ENGL 202 [WI]	Romanticism to Modernism	3.0
ENGL 203 [WI]	Post-Colonial Literature I	3.0
SOC 210	Race and Ethnic Relations	3.0
WMST 101	Introduction to Women's Studies	3.0
Term Credits		15.0

Term 7		
COM 300 [WI]	On-line Journalism	3.0
ENGL 207 [WI]	African American Literature	3.0
ENGL 216 [WI]	Readings in Drama	3.0
Free Elective		3.0
Science, Technology and Human Affairs Elective*		3.0
Term Credits		15.0

Term 8		
COM 340	Desktop Publishing	3.0
ENGL 315 [WI]	Shakespeare	3.0
WRIT 220 [WI]	Creative Nonfiction Writing	3.0
Free Electives		6.0
Term Credits		15.0

Term 9

WRIT 310	Literary Editing & Publication	3.0
English Major Foundational Courses *		6.0
Free Electives		6.0
Term Credits		15.0
Term 10		
ENGL 300	Literature & Science [WI]	3.0
ENGL 323	Literature and Other Arts	3.0
ENGL 360	Literature and Society [WI]	3.0
Free Electives		6.0
Term Credits		15.0
Term 11		
ENGL 380	Literary Theory	3.0
HIST 281	History of Science: Enlightenment to Modernity	3.0
PHIL 361	Philosophy of Science	3.0
ENGL 492 or 490	Seminar in World Literature Seminar in English and American Literature	4.0
Free Electives		3.0
Term Credits		16.0
Term 12		
ENGL 499	Senior Project in Literature	4.0
WRIT 312	The Practice of Professional Writing	3.0
Free Electives		8.0
Term Credits		15.0
Total Credit: 182.0		

* See degree requirements.

Co-op/Career Opportunities

English majors pursue many professional fields in addition to teaching and creative writing. Many go on to law school, politics and government, or business careers. 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.

Co-op employment is an option for English majors who can explore co-op or internship opportunities at Philadelphia 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.

Minor in English

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.

Requirements

Select three of the following:		9.0
ENGL 200	Classical to Medieval Literature [WI]	
ENGL 201	Renaissance to the Enlightenment	
ENGL 202	Romanticism to Modernism [WI]	
ENGL 203	Post-Colonial Literature I [WI]	
ENGL 204	Post-Colonial Literature II	
ENGL 205	American Literature I [WI]	
ENGL 206	American Literature II [WI]	
ENGL 207	African American Literature [WI]	
ENGL 211	British Literature I [WI]	
ENGL 212	British Literature II	
ENGL 214	Readings in Fiction	
ENGL 215	Readings in Poetry [WI]	
ENGL 216	Readings in Drama [WI]	
Select two of the following:		6.0
WRIT 220 [WI]	Creative Nonfiction Writing	
WRIT 225 [WI]	Creative Writing	
WRIT 301 [WI]	Writing Poetry	
WRIT 302	Writing Fiction	
WRIT 303	Writing Humor and Comedy	
WRIT 304 [WI]	Special Topics in Writing	
WRIT 306	Writing About the Media	
WRIT 310	Literary Editing & Publication	
WRIT 312	The Practice of Professional Writing	
WRIT 400 [WI]	Writing in Cyberspace	
WRIT 405	Internship in Literary Publishing	
Select three of the following:		9.0
ENGL 300	Literature & Science [WI]	
ENGL 302	Environmental Literature	
ENGL 303	Science Fiction	
ENGL 305	The Mystery Story [WI]	
ENGL 306	Literature of Baseball	
ENGL 307	Literature of the Holocausts	
ENGL 310	Period Studies [WI]	
ENGL 315	Shakespeare [WI]	
ENGL 320	Major Authors [WI]	
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

English Faculty

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

Valarie Meliotes Arms, PhD (*Temple University*) Associate Director of the First-Year Writing Program. Professor.

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

Valerie Booth, PhD (*Emory University*) Associate Director, Certificate in Writing and Publishing. Assistant Teaching Professor.

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

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

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

Albert DiBartolomeo, MA (*Temple University*) Co-Director, *Drexel Publishing Group*. Teaching Professor. Creative writing, first-year writing.

Dan Driscoll, MA (*Temple University*) Associate Director, Writing Center. Associate Teaching Professor. First-year writing.

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

Lisa Farley, MEd (*Temple University*) Coordinator, *English as a Second Language (ESL)*. Associate 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*) Founding Editor, *Press 1*. Associate Teaching Professor. Twentieth century drama; modern and contemporary American poetry; first-year writing.

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

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

Rebecca Ingalls, PhD (*University of Michigan*) Director, First-Year Writing Program. Associate Professor. Composition and rhetoric.

Henry Israeli, MFA (*University of Iowa*) Associate Director, Certificate in Writing and Publishing. Assistant Teaching Professor. Founder and editor of *Saturnalia Books*, a publisher of contemporary poetry.

Miriam Kotzin, PhD (*New York University*) Founding Director, Certificate in Writing and Publishing; Founding Editor, *Per Contra*. Associate Professor. American literature; genre studies; creative writing; communications.

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

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

Kathleen McNamee, MA (*Cambridge University*). Associate Teaching Professor. Nineteenth-century American literature; British Modernism; first-year writing.

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

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

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

Emilie S. Passow, PhD (*Columbia University*) Co-Director, Certificate Program in Medical Humanities. Associate Teaching Professor. Judaic studies; medical humanities; nineteenth-century British literature.

Margene Peterson, MA (*Rhode Island School of Design*). Instructor. English as a Second Language (ESL).

Abioseh Michael Porter, PhD (*University of Alberta*) Department Head, *English and Philosophy*. Professor. Comparative literature; postcolonial literatures; Editor, *JALA, Journal of the African Literature Association*.

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

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

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

Doreen Alvarez Saar, PhD (*SUNY Buffalo*) Director of English Program, *American Literature Editor, Rocky Mountain Review of Language and Literature*. Professor. Early American literature; race and gender studies.

Sheila Sandapen, PhD (*Indiana University of Pennsylvania*). Assistant Teaching Professor. First-year writing.

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

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

Elizabeth Thorpe, MFA (*Goddard College*). Assistant Teaching Professor. New England literature, illness/healing narratives, and the creative process.

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*) Co-Director, *Drexel Publishing Group*. Associate Teaching Professor. Co-Editor, *Painted Bride Quarterly (PBQ)*; creative writing; first-year writing.

Maria Volynsky, EdD (*Temple University*). Assistant Teaching Professor. English as a Second Language (ESL).

Marshall Warfield, MFA (*University of Pittsburgh*). Assistant Teaching Professor. Craft of composition and the craft of poetry.

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

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

Rachel Wenrick, MFA (*Columbia University*) Associate Director, *Writing Center*. Assistant Teaching Professor. First-year writing program.

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

Jennifer Yusin, PhD (*Emory University*). Assistant Professor. Postcolonial literature.

Emeritus Faculty

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

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 as they think through open-ended questions. Introduces them to rhetorical concepts and terms—exigence, audience, context, argument, and appeals—that they will apply in their writing and critical reading. Teaches them how to find, evaluate, integrate, and document sources from a variety of media; and how to engage in the many stages of the research and writing processes, from invention, to review, to final product. Engages them in ongoing reflective analysis about writing and their writing development.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

ENGL 102 Composition and Rhetoric II: The Craft of Persuasion 3.0 Credits

Teaches terminology and rhetorical strategies of persuasive writing. Advances students' development in the writing process, and promotes their critical evaluation and integration of varied sources as they research complex and open-ended problems. Engages them in the act and study of collaboration, rhetorical awareness of images and design, and an understanding of how genres shape writing. Continues to promote their critical reading of challenging texts. Supports students in ongoing reflective analysis about writing and their writing development.

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: Thematic Analysis Across Genres 3.0 Credits

Teaches terminology and rhetorical strategies of writing analytically about a theme as it appears in a variety of genres. Advances students' development in the writing and research processes, in their rhetorical awareness of images and design, and in their understanding of how genres of writing (poetry, drama, fiction, nonfiction argumentative, investigative, academic, business, reportorial) shape meaning. Continues to promote their critical reading of challenging texts. Supports students in ongoing reflective analysis about writing and their writing development.

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 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

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: ENGL 103 [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

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: ENGL 103 [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

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 203 [WI] Post-Colonial Literature I 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

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: A]

ENGL 204 Post-Colonial Literature II 3.0 Credits

A survey of nonwestern literatures written in 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

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: ENGL 103 [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

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: ENGL 103 [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

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: ENGL 103 [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

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: ENGL 103 [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, Renaissance, seventeenth, and eighteenth centuries. 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 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

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: ENGL 103 [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

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: ENGL 103 [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 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 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 105 [Min Grade: A]

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 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 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 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 illumine 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 105 [Min Grade: A]

ENGL 307 Literature of the Holocausts 3.0 Credits

To underline the fact that more than one Holocaust has occurred, the course offers different points of view about the systematic slaughter of several religious and ethnic groups, pre-and post-World War II, through fiction, children's literature and films.

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 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 105 [Min Grade: A]

ENGL 312 Research Project Development 1.0-3.0 Credit

Acquisition of knowledge and skills related to the development of researchable original ideas that involves literature, philosophy, history, or any other humanities area, or a creative work or portfolio.

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 105 [Min Grade: A]

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 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 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 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 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 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 105 [Min Grade: A]

ENGL 340 [WI] Classic 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 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 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 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 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 Lit 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 Lit; 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 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] and ENGL 102 [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 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 105 [Min Grade: A]

ENGL 399 Independent Project in Literature 0.5-12.0 Credits

This course provides independent study on a project for one term only.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Prerequisites: ENGL 103 [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 4.0 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 3 times for 12 credits

Restrictions: Can enroll if major is ENGL and classification is Junior or Senior.

ENGL 492 Seminar in World Literature 4.0 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 3 times for 12 credits

Restrictions: Can enroll if major is ENGL and classification is Junior or Senior.

ENGL 499 Senior Project in Literature 4.0 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 and classification is Senior.

Environmental Science

Bachelor of Science Degree: 181.5 - 185.5 quarter credits

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 restoration of a clean and healthy environment in the 21st century. The affiliation between the Academy of Natural Science (<http://www.ansp.org>) and Drexel University offers the opportunity to take a national leadership role in environmental science and environmental policy, and 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 investigations. The goal of this program is to give students not only knowledge about biology, 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 Appalachian Mountains. Students are also encouraged to take advantage of study abroad (<http://www.drexel.edu/studyabroad>) options. 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
- Earth Science
- Ecology & Conservation
- Environmental Science

Additional Information

For more information about the program, visit the College's Environmental Science (<http://www.drexel.edu/envscience>) website.

Susan Cole

Undergraduate Advisor

Environmental Science

coles@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, applied ecology, biodiversity 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.

Degree Requirements

Humanities and Social Science

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
COM 230	Techniques of Speaking	3.0
COM 310 [WI]	Technical Communication	3.0
PHIL 341 or PHIL 251	Philosophy of the Environment Ethics	3.0
UNIV S101	The Drexel Experience	1.0
UNIV S201	Looking Forward: Academics and Careers	1.0
CIVC 101	Introduction to Civic Engagement	1.0
Humanities/Social Science electives		6.0
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
CHEM 241	Organic Chemistry I	4.0
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 103	Introduction to Field Methods in Earth Science	2.0
GEO 201 [WI]	Earth Systems Processes	3.0
GEO 301	Advanced Field Methods in Earth Science	2.0
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 302	Environmental Chemistry Laboratory	2.0

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
ENVP 360	Environmental Movements in America	3.0
or ENVP 365	Introduction to Environmental Policy Analysis	
Environmental Science Lab Requirements		2.0
Environmental Concentration Requirements		12.0-16.0
See list of concentration requirements below.		
Environmental Electives		15.0
Free Electives		24.0
Total Credits		181.5-185.5

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

Earth Science Concentration

Required Courses		
GEO 101	Physical Geology	4.0
GEO 102	History of Life on Earth	4.0
GEO 309	Geochemistry	4.0
GEO 310	Sedimentary Environments	4.0
Total Credits		16.0

Ecology & Conservation Concentration

Required Courses		
ENVS 284 [WI]	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		
GEO 101	Physical Geology	4.0
ENVS 275	Global Climate Change	3.0
ENVS 310	Introduction to Environmental Chemistry	3.0
ENVP 360	Environmental Movements in America	3.0
or ENVP 365	Introduction to Environmental Policy Analysis	
Total Credits		13.0

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.

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.

		Credits
Term 1		
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENVS 101	Introduction to Environmental Science	5.0
MATH 101 or 121	Introduction to Analysis I Calculus I	4.0
CHEM 101	General Chemistry I	3.5
UNIV S101	The Drexel Experience	1.0
Term Credits		16.5
Term 2		
BIO 124	Evolution & Organismal Diversity	4.5
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
MATH 102 or 122	Introduction to Analysis II Calculus II	4.0
CHEM 102	General Chemistry II	4.5
CIVC 101	Introduction to Civic Engagement	1.0
Term Credits		17.0
Term 3		
ENVS 102	Natural History, Research and Collections	2.0
GEO 103	Introduction to Field Methods in Earth Science	2.0
CHEM 103	General Chemistry III	5.0
BIO 126	Physiology and Ecology	4.5
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
ENVS 201	Practical Identification of Plants and Animals	2.0

CHEM 241	Organic Chemistry I	4.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
Free Elective		3.0
Term Credits		16.5
Term 5		
ENVS 202	Tree of Life	2.0
ENVS 308	GIS and Environmental Modeling	3.0
GEO 201 [WI]	Earth Systems Processes	3.0
Humanities/Social Science elective		3.0
Free elective		3.0
Term Credits		14.0
Term 6		
ENVS 203	The Watershed Approach	2.0
ENVS 230	General Ecology	3.0
PHYS 152	Introductory Physics I	4.0
ENVS 212	Evolution	4.0
Humanities/Social Science elective		3.0
Term Credits		16.0
Term 7		
ENVP 360 or 365	Environmental Movements in America Introduction to Environmental Policy Analysis	3.0
PHYS 153	Introductory Physics II	4.0
UNIV S201	Looking Forward: Academics and Careers	1.0
ENVS concentration course*		3.0-4.0
Free elective		3.0
Term Credits		14.0-15.0
Term 8		
GEO 301	Advanced Field Methods in Earth Science	2.0
PHYS 154	Introductory Physics III	4.0
MATH 410	Scientific Data Analysis I	3.0
ENVS concentration course*		3.0-4.0
COM 230	Techniques of Speaking	3.0
Term Credits		15.0-16.0
Term 9		
ENVS 302	Environmental Chemistry Laboratory	2.0
ENVS concentration course*		3.0-4.0
MATH 411	Scientific Data Analysis II	3.0
COM 310 [WI]	Technical Communication	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
PHIL 341 Philosophy of the Environment or 251 Ethics	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: 181.5-185.5	

* See degree requirements.

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.

Biodiversity, Earth and Environmental Science Faculty

Walter F. Bien, PhD (*Drexel University*) Director, *Laboratory of Pinelands Research*. Research Professor. Natural resource management, restoration ecology, conservation biology, and New Jersey Pinelands community dynamics.

Donald F. Charles, PhD (*Indiana University*) Senior Scientist and Section Leader, *Phycology Section, Academy of Natural Sciences*. Professor. Diatoms as water quality indicators; paleolimnological approaches for

inferring change in biology and chemistry of lakes; lake management; assessment of perturbations in aquatic ecosystems due to municipal and industrial effluents, land-use change, acid deposition, eutrophication and climate change.

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.

Daniel P. Duran, PhD (*Vanderbilt University*). Assistant Teaching Professor. Phylogeography, systematics and taxonomy, population and conservation genetics, ecological niche modeling, focusing on insect systems to better understand fundamental evolutionary processes and maintain biodiversity.

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.

Richard J. Horwitz, PhD (*University of Chicago*) Senior Scientist; *Fisheries Section Leader; Ruth Patrick Chair of Environmental Sciences*. Professor. Reproductive ecology, life history and distribution of freshwater fishes; effects of land use, habitat structure and hydrology on population dynamics and species composition in aquatic systems; ecological modeling and biometry; anthropogenic contaminants in fishes.

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

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

Kenneth J. Lacovara, PhD (*University of Delaware*). Associate Professor. Vertebrate paleontology of dinosaurs and other animals; Mesozoic terrestrial and coastal ecosystems; preservation of ancient tissues and cells, ancient mangroves, clastic sedimentology, coastal geology, sea level change, evolution and earth history. Field

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.

Richard McCourt, PhD (*University of Arizona*) Associate Curator of *Botany, Academy of Natural Sciences of Drexel University*. Professor. Biodiversity, evolution, ecology, and systematic of green algae, specifically charophyte algae.

Jerry V. Mead, PhD (*SUNY College of Environmental Science and Forestry*) Assistant Scientist and Section Leader, *Watershed and Systems Ecology Section: Academy of Natural Sciences*. Assistant Research Professor. Spatial modeling of aquatic ecosystems; bioenergetics of aquatic invertebrates and fishes; effects of water level management on aquatic organisms; biophysical economics and watershed planning; stream geomorphology and environmental conditions; economics and bioconservation; energy and fisheries.

Michael O'Connor, MD, PhD (*MD, Johns Hopkins University; PhD, Colorado State*). Associate 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: Academy of Natural Sciences*. Professor. Magnitude and origin of species-level diversity in the Mollusca.

James R. Spotila, PhD (*University of Arkansas*). L. Drew Betz Chair Professor. Biology of sea turtles, crocodiles, salamanders, and giant pandas.

Loyc Vanderkluysen, PhD (*University of Hawaii*). Assistant Professor. 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.

Jason D. Weckstein, PhD (*Louisiana State University*) *Associate Curator of Ornithology: Academy of Natural Sciences*. Associate Professor. Avian phylogenetics, population genetics, and evolutionary history; Coevolutionary history of birds and their parasites; biodiversity of birds and their parasites.

Interdepartmental Faculty

Gail Hearn, PhD (*Rockefeller University*). Professor. The conservation of primate species on Bioko Island in Equatorial Guinea, Africa.

Jacob Russell, PhD (*University of Arizona*). Associate Professor. The functional significance and evolutionary histories of symbioses between insects and bacteria.

Emeritus Faculty

John G. Lundberg, PhD (*University of Michigan*) *Emeritus Curator, Academy of Natural Sciences of Drexel University*. 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).

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 ES 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 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

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: C]

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

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 280 Special Topics 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 284 [WI] 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. 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: 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

Restrictions: Cannot enroll if classification is Freshman

ENVS 302 Environmental Chemistry Laboratory 2.0 Credits

In this course 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 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

Restrictions: Can enroll if major is ENVS or major is GEO.

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

Restrictions: Can enroll if major is BIO or major is ENVS.

Prerequisites: ENVS 202 [Min Grade: C] or BIO 126 [Min Grade: C] or BIO 141 [Min Grade: C]

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]

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]

ENVS 323 Tropical Field Studies 3.0 Credits

Ecology of tropical rain forests and dry forests. We will explore physical and biological factors that result in formation of these forests, effect of human impacts on these forests, effectiveness of management of these forests, and the future of these forests in Costa Rica in the field. 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 230 [Min Grade: D] or BIO 126 [Min Grade: D] or BIO 109 [Min Grade: D]

ENVS 324 Microbial Ecology 3.0 Credits

Studies the relationships of microbes with plants, animals, and the environment, both biotic and abiotic components. Examines the key role of microbes in the functioning of ecosystems affecting decomposition, disease, nutrient cycling, and energy flow. Studies these processes and the role of microbes in the natural functions of ecosystems.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: BIO 221 [Min Grade: D] or ENVR 316 [Min Grade: D] or ENVS 316 [Min Grade: D]

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]

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 Senior.

Prerequisites: ENVS 230 [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]

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]

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 at 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 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 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 230 [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]

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: ENVS 230 [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]

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 Senior.

Prerequisites: ENVS 230 [Min Grade: D]

ENVS 391 Diversity, Evolution and Ecology of 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]

Corequisite: ENVS 394

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]

Corequisite: ENVS 393

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: ENVR 401 [Min Grade: D] or ENVS 401 [Min Grade: D]

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 budgets, 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] and (ENVS 284 [Min Grade: D] or BIO 201 [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 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 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 9 credits

Prerequisites: ENVS 212 [Min Grade: C] or BIO 217 [Min Grade: C]

ENVS 480 Special Topics 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

Restrictions: Cannot enroll if classification is Freshman

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 498 Independent Study 0.5-12.0 Credits

Provides independent study in environmental science.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Restrictions: Can enroll if classification is Junior or Senior.

Environmental Studies

Bachelor of Science Degree: 182.0 quarter credits

About the Program

Note: Effective Fall 2014, students are no longer being accepted into this program. Please see the BA in Environmental Studies and Sustainability .

The major in environmental studies is a multi-disciplinary program designed to provide students with both a technical grounding in environmental science as well as a strong emphasis in social science in order to prepare students for environmental policy careers

The causes and consequences of environmental problems are extremely complex, involving the connection of natural ecological systems to human systems such as physical infrastructure and the built environment. Equally important to understanding environmental problems are the social, economic and political considerations that govern society's ability to balance its current needs and desires with those of future generations. Indeed, ecological problems and their consequences are an enduring problem of society. Problems such as air and water pollution, exposure to toxic chemicals, sprawling land development, environmentally damaging energy extraction and unsustainable energy use practices, to name a few, all conspire to negatively influence our natural world as well as human health and well being.

The environmental studies major draws on the University's academic strengths in science, technology, social science and communication. Courses and faculty are drawn from a diverse set of academic programs: including the natural sciences, social sciences and the humanities. The program also benefits from Drexel's urban location -- as issues related to urban sustainability policy and planning, including urban redevelopment and land reuse practices, transportation policy, green building, energy efficiency, urban farming and food systems, recycling, and racial and class-based environmental justice and health -- are core topics of the program of study.

The degree is designed to prepare students for a wide set of vocational opportunities with governmental agencies, corporations, and nonprofit organizations that develop, implement and communicate environmental policies. Students are strongly encouraged to gain valuable professional experience through Drexel's cooperative education program.

For more information visit the Environmental Studies (<http://www.drexel.edu/culturecomm/academics/undergraduate/envrstudies>) page at Drexel University.

Degree Requirements

General Requirements

ANTH 101	Introduction to Cultural Diversity	3.0
or ANTH 110	Human Past: Anthropology and Prehistoric Archeology	
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
COM 150	Mass Media and Society	3.0
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
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
PSCI 110	American Government I	4.0
PSY 101	General Psychology I	3.0
SOC 101	Introduction to Sociology	3.0
UNIV H101	The Drexel Experience	2.0
Two English (ENGL) Electives *		6.0
Philosophy (PHIL) Elective		3.0
Two History (HIST) Electives		6.0
Math Sequences		8.0

Select one of the following sequences:

MATH 101 & MATH 102	Introduction to Analysis I and Introduction to Analysis II
MATH 121 & MATH 122	Calculus I and Calculus II

Environmental Studies Core Requirements

Theory Sequence Requirements

COM 210	Theory and Models of Communication	3.0
SOC 260 [WI]	Classical Social Theory	3.0
ANTH 410	Cultural Theory	3.0
or SOC 460	Contemporary Social Theory	

Methods Sequence Requirements

COM 220	Qualitative Research Methods	3.0
SOC 250	Research Methods I	3.0
SOC 364	Computer-Assisted Data Analysis	3.0

Natural Science Requirements

ENVS 230	General Ecology	3.0
ENVS 286	Community and Ecosystem Ecology	3.0
ENVS 328	Conservation Biology	3.0
Natural Science Elective **		3.0

Other Required Courses

ANTH 360	Culture and the Environment	3.0
COM 316	Campaigns for Health & Environment	3.0
COM 317 [WI]	Environmental Communication	3.0
ENSS 325	Introduction to Urban and Environmental Planning	3.0
ENSS 341	Environmental Movements in America	3.0
ENSS 345	Sociology of the Environment	3.0
ENSS 346	Environmental Justice	3.0
ENSS 347	Introduction to Environmental Policy Analysis	3.0
ENVS 260	Environmental Science and Society	3.0
PSCI 331	Environmental Politics	4.0
SOC 240	Urban Sociology	3.0

Other Environmental Studies Program Electives

Select ten of the following: 30.0

BIO 118	Basics of Cancer
BIO 220	Essential Microbiology
CHEM 111	General Chemistry I
CHEM 112	General Chemistry II
CHEM 151	Applied Chemistry
COM 101	Human Communication
COM 230	Techniques of Speaking
COM 260 [WI]	Fundamentals of Journalism
COM 270 [WI]	Business Communication
COM 280	Public Relations Principles and Theory
COM 310 [WI]	Technical Communication
COM 318	Film, Celebrity and the Environmental Movement
COM 320 [WI]	Science Writing
COM 350 [WI]	Message Design and Evaluation
COM 375 [WI]	Grant Writing
ENGL 302	Environmental Literature
ENSS 275	Global Climate Change
ENSS 480	Special Topics
ENVS 284 [WI]	Physiological and Population Ecology
ENVS 285 [WI]	Population Ecology Laboratory
ENVS 321	Environmental Health
ENVS 322	Tropical Ecology
ENVS 330	Aquatic Ecology
ENVS 413	Advanced Population Ecology
ENVS 436	Principles of Toxicology I
ENVS 437	Principles of Toxicology II
ENVS 441 [WI]	Issues in Global Change I: Seminar
HNRS 201	Colloquium I
PHEV 145	Weather I: Climate and Global Change
PHIL 335	Global Ethical Issues
PHIL 341	Philosophy of the Environment
PSCI 211	American Government II
PSCI 371	Science, Technology, & Public Policy
PSCI 372	City in United States Political Development
PSY 150	Introduction to Social Psychology
SOC 110	Sociology of the Future
SOC 115	Social Problems
SOC 235	Sociology of Health
SOC 330	Developing Nations and the International Division of Labor
SOC 340	Globalization
SOC 343	The American Experience of the Wilderness
SOC 344	Social Movements
SOC 349	Sociology of Disasters

Free Electives 19.0

Total Credits 179.0

Sample Plan of Study

Term 1		Credits
BIO 107	Cells, Genetics & Physiology	3.0
BIO 108	Cells, Genetics and Physiology Laboratory	1.0
MATH 101	Introduction to Analysis I	4.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
SOC 101	Introduction to Sociology	3.0
UNIV H101	The Drexel Experience	2.0
Term Credits		16.0
Term 2		
BIO 109	Biological Diversity, Ecology & Evolution	3.0
BIO 110	Biological Diversity, Ecology and Evolution Laboratory	1.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
MATH 122 or 102	Calculus II Introduction to Analysis II	4.0
Environmental Studies Program Elective*		3.0
Term Credits		14.0
Term 3		
COM 150	Mass Media and Society	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
ENVS 230	General Ecology	3.0
ANTH 110 or 101	Human Past: Anthropology and Prehistoric Archeology Introduction to Cultural Diversity	3.0
Environmental Studies Program Elective*		3.0
Term Credits		15.0
Term 4		
COM 210	Theory and Models of Communication	3.0
COM 220	Qualitative Research Methods	3.0
ECON 201	Principles of Microeconomics	4.0
ENVS 260	Environmental Science and Society	3.0
SOC 240	Urban Sociology	3.0
Term Credits		16.0
Term 5		
ANTH 360	Culture and the Environment	3.0
ECON 202	Principles of Macroeconomics	4.0
ENSS 345	Sociology of the Environment	3.0
SOC 250	Research Methods I	3.0
SOC 260 [WI]	Classical Social Theory	3.0
Term Credits		16.0
Term 6		
CJS 373		
ENVS 286	Community and Ecosystem Ecology	3.0
PSCI 110	American Government I	4.0
PSY 101	General Psychology I	3.0
SOC 364	Computer-Assisted Data Analysis	3.0
Term Credits		13.0

Term 7		
ENSS 346	Environmental Justice	3.0
PSCI 331	Environmental Politics	4.0
ENSS 341	Environmental Movements in America	3.0
	Environmental Studies Program Elective*	3.0
	Natural Science Elective	3.0
Term Credits		16.0
Term 8		
COM 317 [WI]	Environmental Communication	3.0
	English Literature Course 200-level or Above	3.0
	Environmental Studies Program Electives*	9.0
Term Credits		15.0
Term 9		
COM 316	Campaigns for Health & Environment	3.0
	English Literature Course 200-level or Above	3.0
ENSS 325	Introduction to Urban and Environmental Planning	3.0
	Environmental Studies Program Elective*	3.0
	History (HIST) Elective	3.0
Term Credits		15.0
Term 10		
	Free Elective	3.0
ENSS 347	Introduction to Environmental Policy Analysis	3.0
	Philosophy (PHIL) Elective	3.0
	Environmental Studies Program Electives*	6.0
Term Credits		15.0
Term 11		
SOC 460 [WI] or ANTH 410	Contemporary Social Theory or Cultural Theory	3.0
	Free Elective	3.0
	History (HIST) Elective	3.0
	Environmental Studies Program Elective*	3.0
Term Credits		12.0
Term 12		
ENVS 328	Conservation Biology	3.0
	Free Electives	13.0
Term Credits		16.0
Total Credit: 179.0		

* See degree requirements.

Minor in Environmental Studies

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.

Required Courses

ANTH 360	Culture and the Environment	3.0
COM 317 [WI]	Environmental Communication	3.0
ENVS 260	Environmental Science and Society	3.0
SOC 240	Urban Sociology	3.0
ENVP 345	Sociology of the Environment	3.0
ENVP 365	Introduction to Environmental Policy Analysis	3.0
Select two of the following:		6.0
COM 316	Campaigns for Health & Environment	
ECON 351	Resource and Environmental Economics	
PSCI 331	Environmental Politics	
ENVP 346	Environmental Justice	
ENVP 360	Environmental Movements in America	
CJ 373	Environmental Crimes	
SOC 470	Social Change & Planning	

Total Credits **24.0**

Culture and Communication Faculty

Ronald Bishop, III, PhD (*Temple University*). 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*) *Coordinator of the Publication Management Program*. Instructor. Publishing, electronic publishing, publishing and communications, publishing and mass-media.

Robert J. Brulle, PhD (*George Washington University*). Professor. Environmental policy and politics, critical theory, marine risk, social movements, environmental sociology.

Karen Cristiano, PhD (*Temple University*). Associate Teaching Professor. Journalism, medical writing, feature writing, copy editing, mass media and society.

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

Daniela De Pau, PhD (*University of Illinois at Urbana-Champaign*). Assistant Teaching Professor. Italian cinema, relationship between literature, cinema and other arts, traveling literature, women writers, the tradition of the Comic and the tradition of the Fantastic, autobiography, politics of immigration, cultural identity in contemporary Italy.

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*). 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.

Paul Evangelista, PhD (*Temple University*). Assistant Teaching Professor. Public relations, communication theory, new technologies in communication (classroom and online); business communication.

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

Alexander Friedlander, PhD (*Carnegie Mellon University*) Associate Dean, *College of Arts and Sciences*. Associate Professor. Rhetorical theory and practice, document design, writing and technology.

Anthony Glascock, PhD (*University of Pittsburgh*) Coordinator of the *Anthropology Program*. Professor. Aging and health, definitions of functionality and impairment, technology and aging, social organization, Ireland, East Africa.

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

Julia Hall, PhD (*University of Pennsylvania*). Professor. Criminal justice and juvenile justice reform, including community based alternatives to incarceration, correctional education and programming, reentry and reintegration, restorative justice, and issues relating to special needs offenders, including the el

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

Barbara Hornum, PhD (*Bryn Mawr College*) Director of *Center for Academic Excellence (DCAE)*. Associate Professor. Comparative gerontology, planned communities, continuing care communities, retirement, faculty development.

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

Frank Kelley, PhD (*Temple University*). Associate Teaching Professor. Corporate university systems online, power structure of media enterprises, public relations, event planning.

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.

David Kutzik, PhD (*Temple University*) Coordinator of the *Sociology Program*. Professor. Sociology and philosophy of science; applied gerontological research; political economy of health care; microprocessor-based assistive technologies to improve case management and increase independent living among frail populations.

Brent Luvaas, PhD (*UCLA*). Assistant Professor. DIY and independent media production; transnational consumer culture; popular music; new media and mediated subjectivities; youth culture in the US and Indonesia.

Joanna Lyskowitz, MA (*UAM Poznan, Poland*). Instructor. Comparative linguistics, translation, business Spanish, medical Spanish, modern Spanish literature, XXth cent. Spanish poetry, magical realism in Latin American literature.

Diamantino Machado, PhD (*Temple University*). Teaching Professor. Globalization, political economy, political sociology, philosophy of social science, postmodernism and social reflection.

Maria delaluz Matus-Mendoza, PhD (*Temple University*). 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.

Jack Maxwell, MS (*Saint Joseph 's University*). Teaching Professor. Criminal investigations, policing, police administration, domestic violence.

Jordan McClain, PhD (*Temple University*). Assistant Teaching Professor. Media framing and music journalism; relationship between television and music; American popular culture; celebrity, consumerism, and consumer behavior; branding, brand positioning, and advertising criticism.

Margaret McClure, PhD (*University of California at Berkeley*). Assistant Teaching Professor. Research methods, sociology of the family, deviance, military sociology.

Usha Menon, PhD (*University of Chicago*). Associate 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.

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

Anne-Marie Obajtek-Kirkwood, PhD (*University of Pennsylvania*). Associate Professor. French and francophone 20th and 21st century literature, culture and film. Representations of the Occupation (WWII); war; minorities in France; autobiography; feminist issues.

Rakhmiel Peltz, PhD (*Columbia University, Linguistics; University of Pennsylvania, Biological Sciences*) Director of *Judaic Studies Program*. Professor. Sociolinguistics, ethnography of communication, social history of Yiddish language and culture, Yiddish culture of Eastern Europe, language planning, language and ethnic identity, language and group memory, aging and ethnicity, history of urban neighbors.

Douglas V. Porpora, PhD (*Temple University*). Professor. International political economy, culture, social theory, and philosophy of social science.

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.

Devon Powers, PhD (*New York University*). Assistant Professor. Popular music, cultural intermediaries, promotional culture, 20th-century history, journalism studies.

Rachel R. Reynolds, PhD (*University of Illinois at Chicago*). Associate Professor. Sociolinguistics, ethnography of communication, intercultural communication, globalization and the rhetoric of community, political economy of immigration, race and ethnicity, new African immigrants in the United States, Igbo studies.

Cynthia Reed Rickards, MS (*St. Joseph's University*) *Criminal Justice Program*. Assistant Teaching Professor. On-line pedagogy; service-learning pedagogy; juvenile justice; domestic violence.

David Ridgway, MS (*St. Joseph's University*). Instructor. Deviant behaviors, social problems.

Rosemary Rys, MA (*Glassboro State College (now Rowan University)*). Instructor. Public relations and marketing.

Simone Schlichting-Artur, EdD (*University of Pennsylvania*) *Assistant Department Head, Culture and Communication*. 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.

Mimi Sheller, PhD (*New School for Social Research*) *Director of the Mobilities Research and Policy Center at Drexel University*. 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.

Natsumi Shor Assistant Teaching Professor. Business and professional Japanese; Japanese film and culture; interrelation between Japanese language to the nation's culture and thought.

Wesley Shumar, PhD (*Temple University*) *Department Head, Culture and Communication*. Professor. Ethnography of cyberspace, online learning communities, political economy of higher education, globalization, activity theory, semiotics, critical realism, psychoanalysis, identity and the self.

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.

Lawrence Souder, PhD (*Temple University*). Associate Teaching Professor. Science and technical writing, communication ethics.

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

Judith Storniolo, PhD (*University of Pennsylvania*). Teaching Professor. Historical and comparative linguistics, Mesoamerican languages and culture, applied anthropology, public policy, oral traditions and narratives, ideology and ritual, Mesoamerican ethnohistory; and pre-Columbian literature.

Asta Zelenkauskaite, PhD (*Indiana University*). Assistant 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.

Interdepartmental Faculty

Tony H. Grubestic, PhD (*The Ohio State University*) *Director of the Center for Spatial Analytics and Geocomputation (CSAG)*. Professor. Geographic information science, spatial analysis, development, telecommunication policy, location modeling.

Michelle Sahl, PhD, MEd, MBA, MBE (*The University of the Sciences in Philadelphia*). Associate Teaching Professor. Health management and policy: management and leadership of health services organizations, urban health, and the history of health care systems.

Environmental Studies and Sustainability

Bachelor of Arts (BA): 184.0 quarter credits

The BA in Environmental Studies and Sustainability is administered in the Department of Biodiversity, Earth and Environmental Science. 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 common 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 our graduates with communication skills, collaboration abilities and team orientation, a "customer" orientation, creativity and innovative thinking ability, a broad environmental science understanding, 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.

Drexel Advantage

There is a distinct advantage to a student in undertaking an environmental studies 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 is known for its research and scholarship in this area. Over the long history of the program, Drexel has established an extensive network of co-op employers who value Drexel students. Therefore, there is a natural constituency for our students in Environmental Studies and Sustainability as well. Drexel students will take advantage of the co-op program to both get more extensive experience and get paid while doing so.

Degree Requirements

General Requirements

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
ENSS 120	Introduction to Environmental Studies	3.0
UNIV S101	The Drexel Experience	1.0
CIVC 101	Introduction to Civic Engagement	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0

Social and Behavioral Sciences

ANTH 101	Introduction to Cultural Diversity	3.0
or ANTH 110	Human Past: Anthropology and Prehistoric Archeology	

PSY 101	General Psychology I	3.0
SOC 101	Introduction to Sociology	3.0
PSCI 110	American Government I	4.0

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	
ENVS 328	Conservation Biology	3.0
GEO 201 [WI]	Earth Systems Processes	3.0

Humanities and Fine Arts

PHIL 251	Ethics	3.0
PHIL 341	Philosophy of the Environment	3.0
Humanities & Fine Arts Electives		6.0

Diversity Electives

		6.0
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International Studies

		6.0
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Foreign Language (up to 201)

		8.0
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ENSS Core Requirements**Economics**

ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
ENVS 351	Resource and Environmental Economics	4.0

Policy and Planning

ENVS 308	GIS and Environmental Modeling	4.0
PSCI 331	Environmental Politics	3.0
ENSS 325	Introduction to Urban and Environmental Planning	3.0
ENSS 326	Cities and Sustainability	3.0
ENSS 347	Introduction to Environmental Policy Analysis	3.0
GEO 306	Environmental Geology	4.0

Social Science

ENVS 260	Environmental Science and Society	3.0
ANTH 360	Culture and the Environment	3.0
SOC 344	Social Movements	3.0
ENSS 341	Environmental Movements in America	3.0
ENSS 345	Sociology of the Environment	3.0
ENSS 346	Environmental Justice	3.0

Theory and Research**Theory Sequence**

SOC 260 [WI]	Classical Social Theory	3.0
SOC 460 [WI]	Contemporary Social Theory	3.0

Methods Sequence

SOC 250	Research Methods I	3.0
SOC 364	Computer-Assisted Data Analysis	3.0
COM 220	Qualitative Research Methods	3.0
or SOC 350	Research Methods II	

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
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Total Credits	184.0
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Sample Plan of Study

Term 1		Credits
ENSS 120	Introduction to Environmental Studies	3.0
ENVS 101	Introduction to Environmental Science	5.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
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
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
MATH 102	Introduction to Analysis II	4.0
Foreign Language (103 or higher)		4.0
CIVC 101	Introduction to Civic Engagement	1.0
Term Credits		16.0
Term 3		
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
SOC 101	Introduction to Sociology	3.0
ANTH 101	Introduction to Cultural Diversity	3.0
or 110	Human Past: Anthropology and Prehistoric Archeology	
Foreign Language (201 or higher)		4.0
Free elective		3.0
Term Credits		16.0
Term 4		
PSY 101	General Psychology I	3.0
ENVS 260	Environmental Science and Society	3.0
ENVS 230	General Ecology	3.0
ENSS 325	Introduction to Urban and Environmental Planning	3.0
Free elective		3.0
Term Credits		15.0
Term 5		
PSCI 110	American Government I	4.0
ENSS 275	Global Climate Change	3.0
or ENVS 289	Global Warming, Biodiversity and Your Future	
ENVS 308	GIS and Environmental Modeling	4.0
PHIL 341	Philosophy of the Environment	3.0
Term Credits		14.0
Term 6		
ECON 201	Principles of Microeconomics	4.0
SOC 260 [WI]	Classical Social Theory	3.0
Free elective		3.0
ENSS 341	Environmental Movements in America	3.0
ENSS 326	Cities and Sustainability	3.0
Term Credits		16.0

Term 7		
ECON 202	Principles of Macroeconomics	4.0
SOC 250	Research Methods I	3.0
ENSS 347	Introduction to Environmental Policy Analysis	3.0
	International elective	3.0
	Free elective	3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Term Credits		17.0
Term 8		
ANTH 360	Culture and the Environment	3.0
COM 220 or SOC 350	Qualitative Research Methods Research Methods II	3.0
ENVS 351	Resource and Environmental Economics	4.0
ENVS 328	Conservation Biology	3.0
	Free elective	3.0
Term Credits		16.0
Term 9		
SOC 364	Computer-Assisted Data Analysis	3.0
GEO 201 [WI]	Earth Systems Processes	3.0
PHIL 251	Ethics	3.0
	Diversity elective	3.0
	Free elective	3.0
Term Credits		15.0
Term 10		
ENVS 441 [WI]	Issues in Global Change I: Seminar	2.0
PSCI 331	Environmental Politics	3.0
SOC 460 [WI]	Contemporary Social Theory	3.0
ENSS 346	Environmental Justice	3.0
	Humanities & Fine Arts elective	3.0
Term Credits		14.0
Term 11		
ENVS 442	Issues in Global Change II: Research	2.0
GEO 306	Environmental Geology	4.0
ENSS 345	Sociology of the Environment	3.0
	International elective	3.0
	Free elective	3.0
Term Credits		15.0
Term 12		
ENVS 443	Issues in Global Change III: Synthesis	2.0
SOC 344	Social Movements	3.0
	Diversity elective	3.0
	Humanities & Fine Arts elective	3.0
	Free elective	3.0
Term Credits		14.0
Total Credit: 184.0		

The largest job opportunities exist in the areas of environmental communication, sustainability, environmental policy, community action, water quality, parks, outdoor recreation, ecotourism, natural resources and conservation, policy analyst, naturalist, international environmental specialist, and renewable energy.

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

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 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 280 Special Topics 1.0-12.0 Credit

This course will explore current issues and interests in Environmental Studies. The topic will vary each term.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

ENSS 325 Introduction to Urban and Environmental Planning 3.0 Credits

This course serves to introduce students to the field of urban and environmental planning. In doing so, this course seeks to expose students to the skill sets used by planners: including the planning process; citizens participation models; community needs assessment; data analysis and presentation; plan implementation and evaluation; and professional ethics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

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 3.0 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 345 Sociology of the Environment 3.0 Credits

Examines acts of nature vs. acts of man, food and health, environmental politics, social movements and environmental issues, environmental and development policies, and environmental and global change.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

ENSS 346 Environmental Justice 3.0 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 347 Introduction to Environmental Policy Analysis 3.0 Credits

Introduction the development and implementation of U.S. environmental policy, including historical development, political process, methods of analysis and creation of laws, regulations and budgets.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

ENSS 480 Special Topics 1.0-12.0 Credit

This course will explore current issues and interests in Environmental Studies. The topic will vary each term.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

ENSS 499 Independent Study 1.0-12.0 Credit

Provides a course of independent study in Environmental 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

Minor in European Studies

This minor provides students with exposure to the historical, political, social, and cultural development of European civilization. The program focuses on the modern period, but students gain an awareness of the deep historical roots and currents on which the modern experience has been built.

Required Courses

HIST 162	Themes in World Civilization II	3.0
HIST 163	Themes in World Civilization III	3.0
PSCI 120	History of Political Thought	4.0
or PSCI 140	Introduction to Comparative Political Analysis	

European History Courses

Select three European History courses some examples are: 9.0

HIST 235	The Great War, 1914-1918	
HIST 236	World War II	
HIST 241	Modern France	
HIST 242	Modern Italy	
HIST 243	Germany & World of Hitler	
HIST 244	Twentieth Century Russia & the USSR	
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 252	Europe between Wars, 1919-1939	
HIST 258	History of Europe in the 19th Century	
HIST 259	History of Europe in the 20th Century	

Select two of the following: 6.0

ARTH 101	History of Art I: Ancient to Medieval	
ARTH 102	History of Art II: High Renaissance to Modern	
ARTH 103	History of Art: Early to Late Modern	
ENGL 200 [WI]	Classical to Medieval Literature	
ENGL 201	Renaissance to the Enlightenment	
ENGL 202 [WI]	Romanticism to Modernism	
ENGL 310 [WI]	Period Studies	
ENGL 315 [WI]	Shakespeare	
MUSC 231 [WI]	Music History I	
MUSC 232 [WI]	Music History II	

Total Credits 25.0

Geoscience

Bachelor of Science: 185.0 - 189.0 quarter credits

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

General Education Requirements

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
COM 230	Techniques of Speaking	3.0
COM 310 [WI]	Technical Communication	3.0
PHIL 251	Ethics	3.0
or PHIL 341	Philosophy of the Environment	
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 or Social Science electives		6.0
Free electives		24.0

Mathematics and Statistics

Choose 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	
MATH 410	Scientific Data Analysis I	3.0

MATH 411	Scientific Data Analysis II	3.0
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Physical Sciences

CHEM 101	General Chemistry I	3.5
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CHEM 102	General Chemistry II	4.5
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CHEM 103	General Chemistry III	5.0
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Complete one of the following Physics sequences:	8.0
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PHYS 152	Introductory Physics I
& PHYS 153	and Introductory Physics II

PHYS 101	Fundamentals of Physics I
& PHYS 102	and Fundamentals of Physics II

Complete one of the following Biological Sciences sequences:	8.0-9.0
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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

BIO 124	Evolution & Organismal Diversity
& BIO 126	and Physiology and Ecology

Environmental Science

ENVS 101	Introduction to Environmental Science	5.0
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ENVS 102	Natural History, Research and Collections	2.0
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ENVS 212	Evolution	4.0
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ENVS 441 [WI]	Issues in Global Change I: Seminar	2.0
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ENVS 442	Issues in Global Change II: Research	2.0
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ENVS 443	Issues in Global Change III: Synthesis	2.0
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Geoscience Core Courses

GEO 101	Physical Geology	4.0
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GEO 102	History of Life on Earth	4.0
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GEO 103	Introduction to Field Methods in Earth Science	2.0
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GEO 201 [WI]	Earth Systems Processes	3.0
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GEO 210	Structural Geology	4.0
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GEO 215	Minerology	4.0
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GEO 301	Advanced Field Methods in Earth Science	2.0
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GEO 310	Sedimentary Environments	4.0
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GEO 311	Stratigraphy	4.0
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GEO 320	Invertebrate Paleontology	4.0
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GEO 401	Igneous and Metamorphic Petrology	4.0
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Geology Field Camp	3.0
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GEO Electives *	8.0
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Geoscience Concentration Courses	20.0-23.0
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Applied Geology Concentration

ENVS 308	GIS and Environmental Modeling
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GEO 306	Environmental Geology
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GEO 309	Geochemistry
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GEO 412	Geology of Groundwater
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GEO 418	Geophysics
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General Geoscience Concentration

See the Biodiversity, Earth and Environmental Science (BEES) Department for the General Geoscience Concentration course list.

Paleontology Concentration

ENVS 202	Tree of Life
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GEO 365	Field Methods in Paleoecology
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GEO 322	Vertebrate Paleontology
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Paleontology elective *

Choose one of the following:

BIO 224	Form, Function & Evolution of Vertebrates
& BIO 225	and Vertebrate Biology and Evolution Laboratory

ENVS 254	Invertebrate Morphology and Physiology
& ENVS 255	and Invertebrate Morphology and Physiology Lab

Total Credits	185.0-189.0
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* See the Biodiversity, Earth and Environmental Science (BEES) for the GEO Core and Paleo elective list.

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.

Term 1		Credits
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENVS 101	Introduction to Environmental Science	5.0
GEO 101	Physical Geology	4.0
MATH 101	Introduction to Analysis I	4.0
or 121	Calculus I	
UNIV S101	The Drexel Experience	1.0
Term Credits		17.0

Term 2		
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
GEO 102	History of Life on Earth	4.0
MATH 102	Introduction to Analysis II	4.0
or 122	Calculus II	
Choose one of the following biology sequences:	4.0-4.5	
BIO 109	Biological Diversity, Ecology & Evolution	
& BIO 110		
BIO 124	Evolution & Organismal Diversity	
CIVC 101	Introduction to Civic Engagement	1.0
Term Credits		16.0-16.5

Term 3		
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
ENVS 102	Natural History, Research and Collections	2.0
GEO 103	Introduction to Field Methods in Earth Science	2.0
MATH 239	Mathematics for the Life Sciences	4.0
or 123	Calculus III	
Choose one of the following biology sequences:	4.0-4.5	
BIO 107	Cells, Genetics & Physiology	
& BIO 108		
BIO 126	Physiology and Ecology	
Term Credits		15.0-15.5

Term 4		
CHEM 101	General Chemistry I	3.5
ENVS 212	Evolution	4.0
GEO 210	Structural Geology	4.0

Humanities or Social Science elective	3.0
Term Credits	14.5

Term 5

CHEM 102	General Chemistry II	4.5
GEO 201 [WI]	Earth Systems Processes	3.0
GEO 215	Minerology	4.0
Choose one of the following two options, based on chosen concentration:		4.0-5.0
4-credit GEO concentration course		
2-credit GEO concentration (Paleo) course and a 3-credit free elective		
Term Credits		15.5-16.5

Term 6

CHEM 103	General Chemistry III	5.0
COM 230	Techniques of Speaking	3.0
GEO 310	Sedimentary Environments	4.0
PHYS 152 or 101	Introductory Physics I Fundamentals of Physics I	4.0
Term Credits		16.0

Term 7

COM 310 [WI]	Technical Communication	3.0
GEO 311	Stratigraphy	4.0
PHYS 153 or 102	Introductory Physics II Fundamentals of Physics II	4.0
UNIV S201	Looking Forward: Academics and Careers	1.0
Select one of the following options based on chosen concentration:		3.0-5.0
GEO Concentration (Paleo) course		
Free elective		
Term Credits		15.0-17.0

Term 8

GEO 301	Advanced Field Methods in Earth Science	2.0
MATH 410	Scientific Data Analysis I	3.0
PHIL 251 or 341	Ethics Philosophy of the Environment	3.0
GEO Concentration elective		4.0
Free elective		3.0
Term Credits		15.0

Term 9

GEO 320	Invertebrate Paleontology	4.0
MATH 411	Scientific Data Analysis II	3.0
GEO Concentration course		4.0
Free elective		3.0
Term Credits		14.0

Term 10

Geology Field Camp Summer JR Year		3.0
Term Credits		3.0

Term 11

ENVS 441 [WI]	Issues in Global Change I: Seminar	2.0
Humanities or Social Science elective		3.0
GEO Concentration course		4.0

GEO elective	4.0
Free elective	3.0

Term Credits**16.0****Term 12**

ENVS 442	Issues in Global Change II: Research	2.0
GEO Concentration course		4.0
GEO elective		4.0
Free elective		6.0

Term Credits**16.0****Term 13**

ENVS 443	Issues in Global Change III: Synthesis	2.0
GEO 401	Igneous and Metamorphic Petrology	4.0
Free electives		6.0

Term Credits**12.0****Total Credit: 185.0-189.0**

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 (<http://www.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 County, 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.

Biodiversity, Earth and Environmental Science Faculty

Walter F. Bien, PhD (*Drexel University*) Director, *Laboratory of Pinelands Research*. Research Professor. Natural resource management, restoration ecology, conservation biology, and New Jersey Pinelands community dynamics.

Donald F. Charles, PhD (*Indiana University*) Senior Scientist and Section Leader, *Phycology Section, Academy of Natural Sciences*. Professor. Diatoms as water quality indicators; paleolimnological approaches for inferring change in biology and chemistry of lakes; lake management; assessment of perturbations in aquatic ecosystems due to municipal and industrial effluents, land-use change, acid deposition, eutrophication and climate change.

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.

Daniel P. Duran, PhD (*Vanderbilt University*). Assistant Teaching Professor. Phylogeography, systematics and taxonomy, population and conservation genetics, ecological niche modeling, focusing on insect systems to better understand fundamental evolutionary processes and maintain biodiversity.

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.

Richard J. Horwitz, PhD (*University of Chicago*) Senior Scientist; *Fisheries Section Leader; Ruth Patrick Chair of Environmental Sciences*. Professor. Reproductive ecology, life history and distribution of freshwater fishes; effects of land use, habitat structure and hydrology on population dynamics and species composition in aquatic systems; ecological modeling and biometry; anthropogenic contaminants in fishes.

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

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

Kenneth J. Lacovara, PhD (*University of Delaware*). Associate Professor. Vertebrate paleontology of dinosaurs and other animals; Mesozoic terrestrial and coastal ecosystems; preservation of ancient tissues and cells, ancient mangroves, clastic sedimentology, coastal geology, sea level change, evolution and earth history. Field

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.

Richard McCourt, PhD (*University of Arizona*) Associate Curator of *Botany, Academy of Natural Sciences of Drexel University*. Professor. Biodiversity, evolution, ecology, and systematic of green algae, specifically charophyte algae.

Jerry V. Mead, PhD (*SUNY College of Environmental Science and Forestry*) Assistant Scientist and Section Leader, *Watershed and Systems Ecology Section: Academy of Natural Sciences*. Assistant Research Professor. Spatial modeling of aquatic ecosystems; bioenergetics of aquatic invertebrates and fishes; effects of water level management on aquatic organisms; biophysical economics and watershed planning;

stream geomorphology and environmental conditions; economics and bioconservation; energy and fisheries.

Michael O'Connor, MD, PhD (*MD, Johns Hopkins University; PhD, Colorado State*). Associate 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: Academy of Natural Sciences*. Professor. Magnitude and origin of species-level diversity in the Mollusca.

James R. Spotila, PhD (*University of Arkansas*). L. Drew Betz Chair Professor. Biology of sea turtles, crocodiles, salamanders, and giant pandas.

Loyc Vanderkluysen, PhD (*University of Hawaii*). Assistant Professor. 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.

Jason D. Weckstein, PhD (*Louisiana State University*) *Associate Curator of Ornithology: Academy of Natural Sciences*. Associate Professor. Avian phylogenetics, population genetics, and evolutionary history; Coevolutionary history of birds and their parasites; biodiversity of birds and their parasites.

Interdepartmental Faculty

Gail Hearn, PhD (*Rockefeller University*). Professor. The conservation of primate species on Bioko Island in Equatorial Guinea, Africa.

Jacob Russell, PhD (*University of Arizona*). Associate Professor. The functional significance and evolutionary histories of symbioses between insects and bacteria.

Emeritus Faculty

John G. Lundberg, PhD (*University of Michigan*) *Emeritus Curator, Academy of Natural Sciences of Drexel University*. 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).

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 Life on Earth 4.0 Credits

The origin and evolution of life on earth are examined. Topics include the origins of life and the natural histories of plants and animals. The role of natural selection and contingency are emphasized. Lab exercises include hands-on fossil identification and may include fossil collecting trips.

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 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 210 Structural Geology 4.0 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]

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

GEO 301 Advanced Field Methods in Earth Science 2.0 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 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

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]

GEO 310 Sedimentary Environments 4.0 Credits

Students in this course develop an understanding of sedimentary processes and the ability to interpret paleoenvironments based on sedimentological parameters. Topics include current flow, bedforms, siliciclastic and carbonate rocks, fluvial, coastal, and Aeolian environments, taphonomy, and paleosols.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: GEO 101 [Min Grade: D]

GEO 311 Stratigraphy 4.0 Credits

Students in this core course will learn the about foundations of stratigraphy, including the discovery of "Deep Time." Lithostratigraphic, chronstratigraphic, and geochronologic principles will be examined, including the development of the geological time scale. Students will learn to construct stratigraphic cross-section, though lithostratigraphic, biostratigraphic, and sequence stratigraphic correlation. Practical techniques, such as magnetostratigraphy and electrologging will be covered and students will gain hands-on, field experience in stratigraphic settings ranging from the Paleozoic to the Pleistocene.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: GEO 310 [Min Grade: D]

GEO 320 Invertebrate Paleontology 4.0 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 adaptation are emphasized. The lab focuses on hands-on fossil identification.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: ENVS 212 [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: ENVS 212 [Min Grade: D]

GEO 324 Paleobotany 4.0 Credits

The origin and evolution of plants are examined in this course. Topics include plant phylogeny, paleoecology, evolution and adaptation through geological time. Plants will also be examined within the context of long-term climate change and as environmental proxies.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: ENVS 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

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]

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]

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]

GEO 365 Field Methods in Paleoecology 4.0 Credits

Weekly fieldtrips to the Inversand fossil sites in New Jersey form the basis for this course. Students will learn the rudiments of stratigraphy and fossil identification and will learn excavation and data collection techniques. Collected fossils will be prepared by students in labs at Drexel University and at the Academy of Natural Sciences.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

GEO 401 Igneous and Metamorphic Petrology 4.0 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: CHEM 103 [Min Grade: D] and GEO 101 [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 103 [Min Grade: D] and (MATH 239 [Min Grade: D] or MATH 123 [Min Grade: D]) and GEO 101 [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: GEO 101 [Min Grade: D] and (MATH 239 [Min Grade: D] or MATH 123 [Min Grade: D]) and (PHYS 153 [Min Grade: D] or PHYS 102 [Min Grade: D])

GEO 480 Special Topics 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

GEO 497 Research 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 498 Independent Study 12.0 Credits

In this course, students will cover an area of academic study not offered in an existing Geoscience course. Only students with sufficient background work will be accepted by the faculty member for independent work.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Minor in Greek Studies

The minor in Greek studies is designed to be interdisciplinary, with concentration on Mediterranean issues, focusing on and starting from the island of Crete. The minor consists of a minimum of 24.0 credits, 17.0 of which are elective courses chosen with a focus on Greek studies. Because the scope of the minor embraces Hellenism from antiquity to today, students may select their electives depending on the aspect of Greek studies they desire to focus on (for example, mythology, philosophy, performance).

Required Courses

ANTH 212 [WI]	Topics in World Ethnography (When Offered as Anthropology of the Mediterranean)	3.0
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or GREC 212	Introduction to Greek Folklore	
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Select one of the following:		4.0
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GREC 101	Modern Elementary Greek I	
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GREC 102	Modern Elementary Greek II	
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GREC 103	Modern Elementary Greek III	
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GREC 201	Intermediate Modern Greek I	
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Greek Studies Electives

Select 17.0 credits from the following:

ANTH 212 [WI]	Topics in World Ethnography (When offered as Anthropology of the Mediterranean.) *	
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ANTH 380	Special Topics in Anthropology (When offered as Archaeology of the Eastern Mediterranean.)	
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ARTH 101	History of Art I: Ancient to Medieval	
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ENGL 200 [WI]	Classical to Medieval Literature	
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ENGL 323	Literature and Other Arts (When offered as Iphigenia to Arta)	
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ENGL 325	Topics in World Literature (When offered as Greek Literature/Poetry)	
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ENGL 335	Mythology	
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GREC 101	Modern Elementary Greek I *	
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GREC 102	Modern Elementary Greek II *	
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GREC 103	Modern Elementary Greek III *	
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GREC 201	Intermediate Modern Greek I *	
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GREC 212	Introduction to Greek Folklore *	
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GREC 225	Introduction to Greek Music & Dance	
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GREC 380	Special Topics in Greek Studies	
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GREC 399	Independent Study in Greek	
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HIST 280	History of Science: Ancient to Medieval	
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INTB 338	Regional Studies in Economic Policies and International Business (When offered as Mediterranean Economy)	
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MUSC 380	Special Topics in Music (When offered as Mediterranean Ensemble)	
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PHIL 212	Ancient Philosophy	
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PHIL 421 [WI]	Seminar in Ancient Philosophy	
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Drexel in Crete Study Abroad Program Course Offerings

IAS 360	Special Topics in World Civilization	
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ANTH 380	Special Topics in Anthropology (When offered as Crete Through the Looking Glass) **	
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GREC 280	Communicate in Greek: Philoxenia	
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GREC 313	Greek History, Economy & Society	
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Total Credits		7.0
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* Students may only select this course as a Greek Studies elective if it was not already chosen as fulfilling one of the required course options.

** ANTH 340, Crete through a Looking Glass, fulfills this requirement.

Study Abroad in Crete

The Drexel in Crete Program is open to Drexel students scheduled for class during the summer term. This 12-credit program consists of four 3-credit courses. Visit the Drexel in Crete Study Abroad Program website for additional information.

Additional Information

For more information about the Minor in Greek Studies, contact the program director:

Maria Chnaraki, PhD
 Program Director
 Department of Culture & Communication
 College of Arts and Sciences, Drexel University
 mh439@drexel.edu
 grkstud@drexel.edu
 215.895.6143

History

Bachelor of Arts Degree: 182.0 quarter credits

Bachelor of Science Degree: 182.0 quarter credits

About the Program

The history program reflects the strengths of Drexel University, including an extensive offering of courses in the history of science and technology and an expanding array in global history. Required courses emphasize depth in research and an introduction to historical interpretations specific to time and place. But the program also gives students the flexibility to shape curriculum that meets their needs. 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 and the digital world, students will develop a more profound understanding of history and the ways it is made. We encourage students to enrich their education through co-op, study abroad, and summer research projects.

Degrees Offered

The department offers both a Bachelor of Science (BS) and a Bachelor of Arts (BA) in history. Students may choose the program that best fits their needs and future goals.

The **Bachelor of Science (BS)** provides a framework for those students who prefer specific course requirements, including sequences in mathematics and the natural sciences.

The **Bachelor of Arts (BA)** provides a more flexible course of study, which includes foreign language and allows for options in the fulfillment of humanities, social science, math, and science requirements.

In addition to the minor in history, the department also offers minors in American studies, European studies, politics, world history and politics, as well as a minor in science, technology and human affairs.

Additional Information

For more information about this program, please visit the Department of History & Politics (<http://www.drexel.edu/histpol>) website or contact:

Melissa Mansfield
Department Administrator
History + Politics
mmm462@drexel.edu

Degree Requirements (BA)

General Education Requirements

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
UNIV H101	The Drexel Experience	1.0
CIVC 101	Introduction to Civic Engagement	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Two Math courses		6.0-8.0
Two Science courses *		6.0-8.0

Foundation Requirements

Two Studies in Diversity electives	6.0
Two Consecutive Foreign Language courses (must complete level 201)	8.0
Four Humanities/Fine Arts electives	12.0
Four Social Science electives	12.0
Two International Studies electives	6.0

Core History Requirements

HIST 161	Themes in World Civilization I	3.0
HIST 162	Themes in World Civilization II	3.0
HIST 163	Themes in World Civilization III	3.0
HIST 201	United States History to 1815	3.0
HIST 202	United States History, 1815-1900	3.0
HIST 203	United States History since 1900	3.0
HIST 296	Research Methods in History **	3.0
HIST 301	The Study of History **	3.0
HIST 490 [WI]	Senior Seminar I **	3.0
HIST 491 [WI]	Senior Seminar II **	3.0
PSCI 110	American Government I	4.0
PSCI 120	History of Political Thought	4.0
PSCI 140	Introduction to Comparative Political Analysis	4.0
or PSCI 150	International Politics	
Any 200-level European History course		3.0
Any History of Latin America, Africa, or Asia course		3.0

History Electives *** 30.0

Free Electives 36.0

Total Credits 182.0

* Any Biology (BIO), Chemistry (CHEM), Nutrition (NFS), Physics (PHYS), Geoscience (GEO) or Environmental Science (ENVS) course.

** These courses must be taken in sequence.

*** Only 200-level and above HIST courses will fulfill this requirement.

Sample Plan of Study (BA)

Term 1		Credits
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
HIST 161	Themes in World Civilization I	3.0
PSCI 110	American Government I	4.0
UNIV H101	The Drexel Experience	1.0
Foreign language course (103-level or higher)		4.0
Term Credits		15.0
Term 2		Credits
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
HIST 162	Themes in World Civilization II	3.0
Foreign language course (201-level or higher)		4.0
Mathematics course		3.0-4.0
Humanities/fine arts elective		3.0
Term Credits		16.0-17.0
Term 3		Credits
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
HIST 163	Themes in World Civilization III	3.0
PSCI 150	International Politics	4.0
or 140	Introduction to Comparative Political Analysis	
CIVC 101	Introduction to Civic Engagement	1.0
Mathematics course		3.0-4.0
Term Credits		14.0-15.0
Term 4		Credits
HIST 201	United States History to 1815	3.0
HIST 296	Research Methods in History	3.0
Science elective *		3.0-4.0
Humanities/fine arts elective		3.0
History of Latin America, Africa, or Asia		3.0
Term Credits		15.0-16.0
Term 5		Credits
HIST 202	United States History, 1815-1900	3.0
Diversity studies elective		3.0
Humanities/fine arts elective		3.0
Social and behavioral sciences elective		3.0
Science elective *		3.0-4.0
Term Credits		15.0-16.0
Term 6		Credits
HIST 203	United States History since 1900	3.0
PSCI 120	History of Political Thought	4.0
International studies elective		3.0
Diversity studies elective		3.0
Free elective		3.0
Term Credits		16.0

Term 7

History elective (200-level and above HIST course)	3.0
Humanities/fine arts elective	3.0
International studies elective	3.0
Social and behavioral sciences elective	3.0
Free electives	6.0

Term Credits 18.0

Term 8

HIST 301 The Study of History	3.0
UNIV H201 Looking Forward: Academics and Careers	1.0
History of Europe course (200-level or higher)	3.0
History electives (200-level and above HIST courses)	6.0
Free elective	3.0

Term Credits 16.0

Term 9

Social and behavioral sciences elective	3.0
History electives (200-level and above HIST courses)	6.0
Free electives	6.0

Term Credits 15.0

Term 10

HIST 490 [WI] Senior Seminar I	3.0
Social and behavioral sciences elective	3.0
History electives (200-level and above HIST courses)	6.0
Free elective	3.0

Term Credits 15.0

Term 11

HIST 491 [WI] Senior Seminar II	3.0
History electives (200-level and above HIST courses)	3.0
Free electives	6.0

Term Credits 12.0

Term 12

History electives (200-level and above HIST courses)	6.0
Free electives	9.0

Term Credits 15.0

Total Credit: 182.0-186.0

* See degree requirements.

Degree Requirements (BS)**General Education Requirements**

ENGL 101 Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102 Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103 Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
UNIV H101 The Drexel Experience	1.0
CIVC 101 Introduction to Civic Engagement	1.0
UNIV H201 Looking Forward: Academics and Careers	1.0
Any 8-credit Math sequence	8.0
Any 8-credit Science sequence	8.0

Sample Math Sequences *

MATH 101 & MATH 102	Introduction to Analysis I and Introduction to Analysis II
MATH 121 & MATH 122	Calculus I and Calculus II

Sample Science Sequences *

Biology sequence sample:	
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 Samples:

CHEM 111 & CHEM 112	General Chemistry I and General Chemistry II
PHYS 103 & PHYS 104	General Physics I and General Physics II

Literature**Nonwestern Literature Requirement**

Select one of the following: 3.0

ENGL 203 Post-Colonial Literature I [WI]

ENGL 204 Post-Colonial Literature II

Western Literature Requirement

Select one of the following: 3.0

ENGL 200 Classical to Medieval Literature [WI]

ENGL 201 Renaissance to the Enlightenment

ENGL 202 Romanticism to Modernism [WI]

ENGL 205 American Literature I [WI]

ENGL 206 American Literature II [WI]

ENGL 207 African American Literature [WI]

ENGL 211 British Literature I [WI]

ENGL 212 British Literature II

Additional General Requirements

ANTH 101	Introduction to Cultural Diversity	3.0
or ANTH 110	Human Past: Anthropology and Prehistoric Archeology	
COM 150	Mass Media and Society	3.0
ECON 201	Principles of Microeconomics	4.0
ECON 202	Principles of Macroeconomics	4.0
MUSC 130	Introduction to Music	3.0
PSY 101	General Psychology I	3.0
SOC 101	Introduction to Sociology	3.0
PHIL 105	Critical Reasoning	3.0
Any 4-credit Statistics Course		4.0

Core History Requirements

HIST 161	Themes in World Civilization I	3.0
HIST 162	Themes in World Civilization II	3.0
HIST 163	Themes in World Civilization III	3.0
HIST 201	United States History to 1815	3.0

HIST 202	United States History, 1815-1900	3.0
HIST 203	United States History since 1900	3.0
HIST 296	Research Methods in History **	3.0
HIST 301	The Study of History **	3.0
HIST 490 [WI]	Senior Seminar I **	3.0
HIST 491 [WI]	Senior Seminar II **	3.0
PSCI 110	American Government I	4.0
PSCI 120	History of Political Thought	4.0
PSCI 140 or PSCI 150	Introduction to Comparative Political Analysis International Politics	4.0
Any 200-level European History course		3.0
Any History of Latin America, Africa, or Asia course		3.0
History Electives ***		30.0
Free Electives		40.0
Total Credits		182.0

- * Additional math and science sequence options are available. Students should check with the the Department.
- ** These courses must be taken in sequence.
- *** Only 200-level and above HIST courses will fulfill this this requirement.

Sample Plan of Study (BS)

	Credits
Term 1	
ENGL 101	3.0
Composition and Rhetoric I: Inquiry and Exploratory Research	
HIST 161	3.0
MATH 101	4.0
PSCI 110	4.0
UNIV H101	1.0
Term Credits	
15.0	
Term 2	
COM 150	3.0
ENGL 102	3.0
Mass Media and Society Composition and Rhetoric II: The Craft of Persuasion	
HIST 162	3.0
MATH 102	4.0
PHIL 105	3.0
Term Credits	
16.0	
Term 3	
ENGL 103	3.0
Composition and Rhetoric III: Thematic Analysis Across Genres	
HIST 163	3.0
MUSC 130	3.0
PSCI 120	4.0
PSY 101	3.0
CIVC 101	1.0
Term Credits	
17.0	
Term 4	
HIST 201	3.0
HIST 296	3.0
United States History to 1815 Research Methods in History	

Western Literature Survey course *		3.0
History of Latin America, Africa, or Asia		3.0
Science sequence course 1 *		4.0
Term Credits		16.0
Term 5		
HIST 202	United States History, 1815-1900	3.0
ENGL 203 [WI] or 204	Post-Colonial Literature I Post-Colonial Literature II	3.0
PSCI 140 or 150	Introduction to Comparative Political Analysis International Politics	4.0
SOC 101	Introduction to Sociology	3.0
Science sequence course 2 *		4.0
Term Credits		17.0
Term 6		
ECON 201	Principles of Microeconomics	4.0
HIST 203	United States History since 1900	3.0
ANTH 110 or 101	Human Past: Anthropology and Prehistoric Archeology Introduction to Cultural Diversity	3.0
Free electives		4.0
Term Credits		14.0
Term 7		
ECON 202	Principles of Macroeconomics	4.0
Statistics elective		4.0
Free electives		6.0
Term Credits		14.0
Term 8		
HIST 301	The Study of History	3.0
History of Europe course (200-level or higher)		3.0
History electives (200-level and above HIST courses)		6.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Free elective		3.0
Term Credits		16.0
Term 9		
History electives (200-level and above HIST courses)		6.0
Free electives		9.0
Term Credits		15.0
Term 10		
HIST 490 [WI]	Senior Seminar I	3.0
Free electives		6.0
History electives (200-level and above HIST courses)		6.0
Term Credits		15.0
Term 11		
HIST 491 [WI]	Senior Seminar II	3.0
History electives (200-level and above HIST courses)		6.0
Free electives		6.0
Term Credits		15.0
Term 12		
History electives (200-level and above HIST courses)		6.0

Free electives	6.0
Term Credits	12.0

Total Credit: 182.0

* See degree requirements.

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 Department's MS in Science, Technology, and Society program, an MBA or other business program, or law school.

Accelerated/Dual Degrees

About the Programs

Two accelerated/dual degrees are available:

- BS/BA in History and MS in Science, Technology & Society program
- BS/BA in History and the MS(LIS) 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 provides an opportunity to simultaneously earn both a BA or BS degree and an MS degree in Science, Technology & Society (two diplomas are awarded) in the time normally required to finish a bachelor's degree alone.

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 BS/MS program.

The Department of History and Politics would especially like to encourage its own majors to consider the accelerated Science, Technology & Society program.

Additional Information

For more information about the accelerated BA-BS/MS program, contact:

STS Program Director
3025 MacAlister Hall
215.895.2463

Recommended Plan of Study

Students should work closely with faculty advisors in the Science, Technology & Society program to schedule an individualized plan of study for their accelerated degree completion.

The following is a sample plan of study for a student starting in pre-junior year, with 108.0 credit hours completed (based on a 5-year program in which the last co-op was dropped):

Dual Bachelor's Degree & MSTS Degree

222.0 minimum credits (quarter)

Term	Credits
Term 7	
Undergraduate courses	13.0
Two Science, Technology & Society courses	6.0
Term Credits	19.0
Term 8	
Undergraduate courses	13.0
Two Science, Technology & Society courses	6.0
Term Credits	19.0
Term 9	
Undergraduate courses	10.0
Two Science, Technology & Society courses	6.0
One graduate elective*	3.0
Term Credits	19.0
Term 10	
HIST 696 Seminar in Science, Technology, and Society	3.0
Undergraduate courses	10.0
Two Science, Technology & Society courses	6.0
Term Credits	19.0
Term 11	
HIST 697 Practicum: Science and Technology in Action	3.0
Undergraduate courses	13.0
One graduate elective*	3.0
Term Credits	19.0
Term 12	
HIST 698 Master's Thesis	6.0
Undergraduate courses	10.0
One graduate elective	3.0
Term Credits	19.0
Total Credit: 114.0	

* Graduate electives may be taken as graduate-level courses in History-Politics, or from other departments or colleges within the University.

BS/BA in History and the MS(LIS) Accelerated Degree

This program pairs the undergraduate History major with the school's MS in Library and Information Science in an accelerated time-frame. Students have the opportunity to earn both the undergraduate and graduate degrees in five years. For students completing this program, the undergraduate background in history provides a natural fit with areas of library specialization, such as archival studies.

About the Program

Applicants will be provisionally admitted into the program as incoming freshmen. Participants have the option of choosing either a one or a two co-op history program. The non-co-op option is not available for students choosing this accelerated degree option.

Students complete 180.0 credits toward the BA in History or the BS in History degree, with five fewer free elective credits than the non-accelerated program. Students complete 45.0 credits for the MS in Library and Information Science degree (<http://www.drexel.edu/catalog/masters/mslis.htm>), starting to complete some graduate requirements during the last years of the BS or BA portion of their program.

While completing the BS or BA portion of the program, students must complete one of the following undergraduate information science courses:

INFO 101	Introduction to Information Technology	3.0
INFO 105	Introduction to Informatics	3.0
INFO 108	Foundations of Software	3.0
INFO 110	Human-Computer Interaction I	3.0
INFO 215	Social Aspects of Information Systems	3.0

When BS/BA students have accumulated 90.0 credits, but have not yet registered for 120.0 credits, they can apply to formally enter the graduate program. The student must have at least a 3.2 GPA, and they must maintain this 3.2 GPA for the graduate portion of the program.

Advising/Plan of Study

Students should work closely with faculty advisors to schedule and maintain a plan of study throughout the accelerated program.

Additional Information

For more information on the undergraduate history portion of the program, contact:

Melissa Mansfield, Department Administrator
History & Politics
MacAlister Hall 3025
mmm462@drexel.edu

For more information on the graduate portion of the program, contact:

Lynne Hickle
Program Coordinator
College of Computing and Informatics
leh25@drexel.edu

Minor in History

Students select one of the following sequences: 9.0

Sequence A	
HIST 161	Themes in World Civilization I
HIST 162	Themes in World Civilization II
HIST 163	Themes in World Civilization III
Sequence B	
HIST 201	United States History to 1815
HIST 202	United States History, 1815-1900
HIST 203	United States History since 1900
History Elective	
Additional 200-level or higher HIST courses	15.0
Total Credits	24.0

History + Politics Faculty

Lloyd Ackert, PhD (*Johns Hopkins University*). Associate Teaching Professor. Russian science, history of biology, ecology.

Scott Barclay, PhD (*Northwestern University*) *Department Head, History + Politics*. Professor. Judicial systems, civil rights, public policy and administration.

Zoltan Buzas, PhD (*Ohio State University*). Post-Doctoral Fellow. International relations theory, international security, race and politics, diplomatic history.

George Cicciariello-Maher, PhD (*University of California, Berkeley*). Assistant Professor. Colonialism, social movements, political theory.

Rose Corrigan, PhD (*Rutgers University*) *Director of Women's Studies Program*. Associate Professor. Women, public law, American politics and policy.

Richardson Dilworth, PhD (*Johns Hopkins University*) *Director, Center for Public Policy*. Associate Professor. American political development, urban politics, public policy.

Erin R. Graham, PhD (*Ohio State University*). Assistant Professor. International institutions, international relations theory, global environmental politics.

Amelia Hoover Green, PhD (*Yale University*). Assistant Professor. Dynamics of conflict-related violence; intra-armed group politics and socialization; statistics in human rights.

Christian Hunold, PhD (*University of Pittsburgh*). Associate Professor. Environmental policy and comparative politics.

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, social theory.

Scott G. Knowles, PhD (*Johns Hopkins University*) *Associate Dean and Director, Center for Interdisciplinary Inquiry, Pennoni Honors College*. Associate Professor. Urban history, history of technology, modern history.

Jonson Miller, PhD (*Virginia Tech*). Associate Teaching Professor. Science and technology, American history, military history.

Julie Mostov, PhD (*New York University*) *Associate Vice Provost for International Programs*. Professor. Modern political thought, democratic

theory, nationalism, gender studies, South Eastern Europe and the Balkans.

Joel E. Oestreich, PhD (*Brown University*) *Director of International Area Studies*. Associate Professor. International organizations, international finance, development, and human rights.

William L. Rosenberg, PhD (*Temple University*). Professor. Behavioral politics, public opinion, and political communication.

Tiago Saraiva, PhD (*Universidad Autónoma de Madrid*). Assistant Professor. Science and fascism, environment in contemporary history, global circulation of science, industrialized organisms and food, model organisms and genetics research.

Jonathan Seitz, PhD (*University of Wisconsin*) *Director of Undergraduate Studies for History + Politics*. Associate Teaching Professor. History of religion, science, medicine, witchcraft, early modern Europe, Italy.

Amy Slaton, PhD (*University of Pennsylvania*). Professor. History of science and technology; 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*). Associate Professor. Modern Latin American history.

Robert Zaller, PhD (*Washington University*). Professor. English history and early modern European history.

Emeritus Faculty

Eric Dorn Brose, PhD (*Ohio State University*). Professor Emeritus. German and European history.

Richard L. Rosen, PhD (*Case Western Reserve University*). Associate Professor Emeritus. History of science, appropriate technology, and world history.

Courses

HIST 140 Europe and the Modern World I 4.0 Credits

Provides an introduction to the 18th and 19th centuries, including the Age of Enlightenment, the American Revolution, the French Revolution and Napoleonic era, transatlantic industrialization, liberalism and nationalism, the revolutions of 1848, the American Civil War, and the unifications of Italy and Germany.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

HIST 141 Europe and the Modern World II 4.0 Credits

Examines imperialism; the rise of the United States and Japan as world powers; the spread of industrialization, democracy, and socialism; world wars; communism and fascism; and the rise of the non-West.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: HIST 140 [Min Grade: D]

HIST 161 Themes in World Civilization I 3.0 Credits

Examines development of civilizations from antiquity to the 12th century. Views 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 3.0 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 3.0 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 201 United States History to 1815 3.0 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

Restrictions: Cannot enroll if classification is Freshman

HIST 202 United States History, 1815-1900 3.0 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 3.0 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 209 The United States & Central America: From Monroe Doctrine to Cold War 3.0 Credits

Covers the history of relations between the United States and the nations of Central America.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

HIST 212 Themes in African-American History 3.0 Credits

Explores the major issues in the development of Afro-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

Restrictions: Cannot enroll if classification is Freshman

HIST 214 United States Civil Rights Movement 3.0 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 3.0 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 relationship between history and memory and the impact of the social, political, and gendered imagination are investigated.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

HIST 216 Freedom in America 3.0 Credits

This course examines African-American history, 1865 to the present, and explores the impact of gender and sexuality in history. Specifically, comparing primary and secondary sources in order to critique how history itself is manufactured and to investigate the role that sexuality and gender play on that process.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

HIST 218 Race and Film in United States History 3.0 Credits

This course examines the interplay between history, film and African American? pursuit of social justice and equality. Specifically, the use of films as cultural artifacts or prisms through which better understanding of the dynamics of race and racial inscription in America.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

HIST 220 History of American Business 3.0 Credits

Examines the development of business in the United States from the 1870s to the present. Emphasizes the evolving structure of business enterprise, business/government relations, business in an international context, and business and American culture.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

HIST 222 History of Work & Workers in America 3.0 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 transformation of the workplace in the 20th.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

HIST 223 Women and Work in America 3.0 Credits

Examines the historical roots of women's work in the U.S. from the Colonial period to the present, including women and unions, occupational segregation, race and ethnicity, industrialization, depression, war, and the rise of a consumer economy.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

HIST 224 Women in American History 3.0 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

Restrictions: Cannot enroll if classification is Freshman

HIST 230 United States Military History I (before 1900) 3.0 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

Restrictions: Cannot enroll if classification is Freshman

HIST 231 US Military History II (since 1900) 3.0 Credits

Examines the emergence of the United States as a major military power, including military/civil relationships; the impact of technological change; and the world, Korean, and Vietnam wars.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

HIST 232 The American Revolution 3.0 Credits

Investigates why Americans rebelled against Great Britain, how they gained their independence against staggering odds, and the new problems created by independence. Looks at the Revolution as a model of the first successful struggle of colonial subjects against their European overlords.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

HIST 234 The United States Civil War 3.0 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 3.0 Credits

Examines the global causes, conduct, and consequences of World War I, which fundamentally altered our century's political, social, economic, and cultural institutions.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

HIST 236 World War II 3.0 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

Restrictions: Cannot enroll if classification is Freshman

HIST 237 Topics in the Cold War 3.0 Credits

Investigates various aspects of the History of the Cold War from 1947 to 1991. Topics will vary from U.S. domestic politics, the politics of the nuclear age, to other foreign policy aspects of the Cold War in its different stages.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

HIST 238 The Vietnam War 3.0 Credits

Covers Southeast Asia before the French, the French imperium, the First Indochina War, entry of the United States, the Second Indochina War, and withdrawal of the United States.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

HIST 241 Modern France 3.0 Credits

Discusses France since the Revolution, with emphasis on the Third and Fourth Republics. Seeks to reconcile the appearance of extreme political instability and intellectual ferment with evidence of strong economic and social conservatism.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

HIST 242 Modern Italy 3.0 Credits

Covers Italy from Napoleon to the present, including risorgimento, unification, trasformismo, fascism, and the post-World War II period.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

HIST 243 Germany & World of Hitler 3.0 Credits

Examines German history since 1815. Emphasizes the roots of national socialism, the world wars, and Hitler the man. Ends with the fall of East Germany, the reunification of 1990, and recent trends.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

HIST 244 Twentieth Century Russia & the USSR 3.0 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

Restrictions: Cannot enroll if classification is Freshman

HIST 245 England to Elizabeth, to 1558 3.0 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 3.0 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

Restrictions: Cannot enroll if classification is Freshman

HIST 247 Modern England, 1815 - present 3.0 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

Restrictions: Cannot enroll if classification is Freshman

HIST 249 Modern Jewish History 3.0 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 3.0 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

Restrictions: Cannot enroll if classification is Freshman

HIST 251 Fascism 3.0 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

Restrictions: Cannot enroll if classification is Freshman

HIST 252 Europe between Wars, 1919-1939 3.0 Credits

Examines Europe in the 1920s and 1930s, with emphasis on totalitarianism and the causes of World War II. Analyzes the search for peace and stability following World War I; totalitarianism in Italy, Germany, and the Soviet Union; the decline of Great Britain and France and their appeasement policies; and Nazi fascist aggression and the crises leading to World War II.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

HIST 253 Jewish Life and Culture in the Middle Ages 3.0 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 3.0 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. Fulfills a non-Western distribution requirement.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

HIST 258 History of Europe in the 19th Century 3.0 Credits

Analysis of the forces and events that define European civilization in the 19th century, from the Congress of Vienna to the origins of WW1.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

HIST 259 History of Europe in the 20th Century 3.0 Credits

Analysis of the forces and events that define European civilization in the 20th century, from the outbreak of WW1 to the present.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

HIST 263 The World and China 3.0 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

Restrictions: Cannot enroll if classification is Freshman

HIST 264 East Asia in Modern Times 3.0 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

Restrictions: Cannot enroll if classification is Freshman

HIST 267 Twentieth Century World I 3.0 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 3.0 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 3.0 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

Restrictions: Cannot enroll if classification is Freshman

HIST 271 History of Mexico 3.0 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

Restrictions: Cannot enroll if classification is Freshman

HIST 272 Ancient and Colonial Mexico 3.0 Credits

Surveys Mexico from the ancient Aztecs; their conquest by the Spanish; and three hundred years of colonialism under the Habsburg and Bourbon dynasties to the 1810s. Covers role of race, class, gender and family (marriage and food).

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

HIST 273 Modern Mexico 3.0 Credits

Surveys Mexico from the Wars of Independence (1810's) to the present. Pays attention to changing values evident in rituals, celebrations and food.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

HIST 274 Conquest of Mexico 3.0 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 sources (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 276 The History of Philadelphia 3.0 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 280 History of Science: Ancient to Medieval 3.0 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 their broader political, economic, social, cultural contexts.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

HIST 281 History of Science: Enlightenment to Modernity 3.0 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 their broader historical contexts.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

HIST 282 History of Science: Medieval to Enlightenment 3.0 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 285 Technology in Historical Perspective 3.0 Credits

Examines the causal interrelations between technological progress and developments in 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

Restrictions: Cannot enroll if classification is Freshman

HIST 286 Exploration in Technology and Gender 3.0 Credits

Examines how, when, and why science and technology have become masculinized since the 12th century, producing a world without women.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

HIST 290 Technology and the World Community 3.0 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

Restrictions: Cannot enroll if classification is Freshman

HIST 292 Technology in American Life 3.0 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

Restrictions: Cannot enroll if classification is Freshman

HIST 296 Research Methods in History 3.0 Credits

Designed for history majors, 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

HIST 298 Special Studies in History 12.0 Credits

Provides supervised individual study of subjects in history. May be repeated for credit.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Restrictions: Cannot enroll if classification is Freshman

HIST 299 Historical Background of Current Issues 3.0 Credits

Examines a current policy issue in its historical context. See departmental brochure for topic scheduled for a particular term. May be repeated for credit.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Restrictions: Cannot enroll if classification is Freshman

HIST 301 The Study of History 3.0 Credits

Introduces the discipline of history and historical research. Examines 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: Cannot enroll if classification is Freshman

Prerequisites: HIST 296 [Min Grade: D]

HIST 310 Women, Crime, and 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

HIST 332 [WI] Junior Seminar 3.0 Credits

A research seminar directed by a historian. Requires students to write an extended paper on a topic selected in consultation with the instructor. 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

HIST 490 [WI] Senior Seminar I 3.0 Credits

Requires 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: Cannot enroll if classification is Freshman

Prerequisites: HIST 301 [Min Grade: D]

HIST 491 [WI] Senior Seminar II 3.0 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: Cannot enroll if classification is Freshman

Prerequisites: HIST 490 [Min Grade: D]

HIST 492 Senior Seminar 3.0 Credits

The senior capstone course in history. Students complete an in-depth research project supervised by an historian.

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]

Minor in Human Factors and Ergonomics

This minor is intended to meet the needs of the students who have an interest in any type of design and who recognize the importance of taking account of human characteristics, both strengths and weaknesses, in the design of artifacts intended for human use (e.g., equipment, computer software, consumer products, and even entire work environments).

The minor should also be of particular interest to students who have an interest in doing graduate work in human factors, ergonomics, industrial design, etc.

Entry into the minor requires that general psychology (or an equivalent introductory course) be taken as a prerequisite. Students who have completed PSY 101 and who are interested in a minor in Psychology are expected to meet with a Psychology Department faculty member to discuss the selection of appropriate courses. No more than three courses that are required for a student's major can count towards fulfilling requirements for the minor.

Required Prerequisite

General Psychology course (PSY 101 or equivalent)

Required Courses

PSY 212	Physiological Psychology	3.0
PSY 213	Sensation and Perception	3.0
PSY 250 [WI]	Industrial Psychology	3.0
PSY 330	Cognitive Psychology	3.0
PSY 332	Human Factors and Cognitive Engineering	3.0
PSY 337	Human-Computer Interaction	3.0
PSY 360 [WI]	Experimental Psychology	3.0
BMES 330	Biological Rhythm in Pharmacology and Toxicology	3.0

Select one course from the following:

BMES 350	Med & Bio Effects Of Light
BMES 411	Chronoengineering I: Biological Rhythms in Health and Performance
BMES 412	Chronoengineering II: Sleep Functions in Health and Performance
PSY 150	Introduction to Social Psychology
PSY 230	Psychology of Learning
PSY 310	Drugs & Human Behavior
PSY 340	Psychological Testing and Assessment
PSY 350	Advanced Social Psychology

Total Credits

24.0

International Area Studies

Bachelor of Arts Degree: 182.0 quarter credits

About the Program

International area studies is a language-based, interdisciplinary major designed to prepare students for careers in a global environment.

The International Area Studies Program (<http://www.drexel.edu/ias>) offers a BA in international area studies and minors in international area studies and in eight languages: Arabic, Chinese, French, German, Italian, Japanese, Russian, and Spanish. Courses in a ninth language—Korean—are currently offered at the introductory level, and the Modern Language program plans to develop advanced-level Korean courses in the near future.

International area studies (IAS) at Drexel University is an interdisciplinary, intercultural, and interactive major, linking language study with other academic disciplines such as politics, history, economics, sociology, anthropology, literature and philosophy. It provides critical direction in study, research and professional experience necessary to understanding current global trends in politics, sociology and economics. IAS also offers an innovative framework for the preparation of responsible citizens who are aware of larger world issues and local concerns and are able to draw on both the arts and sciences in considering these changes.

The four thematic concentrations—justice and human rights; global science, sustainability and health; international business and economics; and literature, culture and arts—provide dynamic frameworks for studying about international technology transfers, humanitarian crises, border crossings, and global culture.

Students majoring in the program study one or more languages, and may qualify for the University's advanced-level Certification of Proficiency in their target language or languages. French, German, Italian and Spanish are the Western languages available; non-Western languages include Arabic, Chinese, Japanese, and Russian. The major enrolls a number of students from abroad as well as students who lived or studied in Europe, Latin America, or Asia during high school.

IAS programs give international area studies students the option of study programs in Brussels, Bonn, Berlin, Madrid, Paris, and London. The programs feature academic internships with national legislatures, the European Parliament, international law firms, nongovernmental service agencies, and multinational corporations. IAS Abroad programs are also available in China, Japan, Russia, and Costa Rica.

Additional Information

For additional information about the program, contact:

Dr. Joel Oestreich
 Director of International Area Studies
 Associate Professor of Political Science
 215.895.6794
 Jeo25@drexel.edu

Degree Requirements

Students select one of the following four concentrations, each having unique degree requirements:

- Global Science, Sustainability Technology and Health Society
- International Business and Economics
- Justice and Human Rights
- Literature, Culture and the Arts

Global Science, Sustainability and Health (GSSH)**General Requirements**

ANTH 101	Introduction to Cultural Diversity	3.0
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
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
ENGL 204	Post-Colonial Literature II	3.0
LING 102	Language and Society	3.0
PHIL 105	Critical Reasoning	3.0
PSCI 150	International Politics	4.0
ENVS 260	Environmental Science and Society	3.0
CIVC 101	Introduction to Civic Engagement	1.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Two mathematics courses		6.0-8.0
One additional science course		3.0-4.0
One ethics course		3.0

IAS Core Curriculum Requirements

IAS 190	Global Research Methods	3.0
IAS 359	Culture and Values	3.0
IAS 360	Special Topics in World Civilization	3.0
WMST 240	Women and Society in a Global Context	3.0

Language Requirements 21.0-36.0

At least 4 language courses at the 300-level are required for graduation, with a minimum of 21 credits in at least one language.

Area-specific Courses 6.0

Students select two region-specific courses approved by IAS. Courses must focus on the same region, but can be in any discipline.

Global Science, Sustainability and Health Concentration Requirements

ANTH 360	Culture and the Environment	3.0
or SOC 345	Sociology of the Environment	
CULA 427	The Kitchen Garden: Fall	3.0
PBHL 301	Epidemiology in Public Health	3.0
PBHL 303	Overview of Issues in Global Health	3.0
PHIL 335	Global Ethical Issues	3.0
SOC 235	Sociology of Health	3.0
SOC 346	Environmental Justice	3.0

Choose one of the following History courses 3.0

HIST 280	History of Science: Ancient to Medieval
HIST 281	History of Science: Enlightenment to Modernity
HIST 282	History of Science: Medieval to Enlightenment

Choose one of the following English classes 3.0

ENGL 300	Literature & Science [WI]
ENGL 302	Environmental Literature
ENGL 370	Topics in Literature and Medicine

Global Science, Sustainability and Health Distribution Options 33.0-36.0

Select eleven of the following:

ANTH 210	Worldview: Science, Religion and Magic [WI]
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
CJ 373	Environmental Crimes
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	Literature & Science [WI]
ENGL 302	Environmental Literature
ENGL 370	Topics in Literature and Medicine
ENVS 169	Environmental Science
ENVS 275	Global Climate Change
or ENVP 275	Global Climate Change
ENVS 289	Global Warming, Biodiversity and Your Future
ENVS 321	Environmental Health
ENVS 328	Conservation Biology
HIST 280	History of Science: Ancient to Medieval
HIST 281	History of Science: Enlightenment to Modernity
HIST 282	History of Science: Medieval to Enlightenment
HSAD 312	Development of World Health Care
HSAD 316	Health Care across Cultures
IAS 320	Building Global Bridges
IAS 360	Special Topics in World Civilization ***
IAS 390	Special Topics in International Area Studies ***
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
PHIL 321	Biomedical Ethics
PHIL 341	Philosophy of the Environment
PHIL 351	Philosophy of Technology
PHIL 355	Philosophy of Medicine
PHIL 361	Philosophy of Science
PSCI 331	Environmental Politics
PSCI 351	International Organizations: The United Nations
PSCI 352	Ethics and International Relations
PSCI 353	International Human Rights
PSY 352	Environmental Psychology
SOC 315	HIV/AIDS and Africa

SOC 330	Developing Nations and the International Division of Labor	
SOC 340	Globalization	
SOC 435	Seminar - Organization of American States ***	
WMST 275	Women's Health & Human Rights	

Electives 33.0-12.0

Total Credits 183.0

* Special topics courses with an international or relevant theme will be considered for course credit upon request and review.

** As appropriate to the major.

*** Repeatable for credit.

International Business and Economics

General Requirements

ANTH 101	Introduction to Cultural Diversity	3.0
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
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
ENGL 204	Post-Colonial Literature II	3.0
LING 102	Language and Society	3.0
PHIL 105	Critical Reasoning	3.0
PSCI 150	International Politics	4.0
CIVC 101	Introduction to Civic Engagement	1.0
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
One ethics course		3.0

IAS Core Curriculum Requirements

IAS 359	Culture and Values	3.0
IAS 360	Special Topics in World Civilization	3.0
IAS 190	Global Research Methods	3.0
WMST 240	Women and Society in a Global Context	3.0

Language Requirements

At least 4 language courses at the 300-level are required for graduation, with a minimum of 21 credits in at least one language. 21.0-36.0

Area-specific Courses

Students select two region specific courses approved by IAS. 6.0
Courses must focus on the same region, but can be in any discipline.

International Business and Economics Concentration Requirements

ANTH 310	Societies In Transition: The Impact of Modernization and the Third World	3.0
or SOC 330	Developing Nations and the International Division of Labor	
BLAW 340	International Business Law	4.0
ECON 342	Economic Development	4.0
ENGL 308 [WI]	The Literature of Business	3.0

INTB 332	Multinational Corporations	4.0
INTB 334	International Trade	4.0
INTB 338	Regional Studies in Economic Policies and International Business	4.0
PHIL 301	Business Ethics	3.0
SOC 260 [WI]	Classical Social Theory	3.0

International Business and Economics Distribution Options

Select eleven of the following: 33.0-44.0

ANTH 312	Approaches to Intercultural Behavior	
COM 270 [WI]	Business Communication	
COM 345	Intercultural Communication	
COM 360	International Communication	
COM 361	International Public Relations	
COM 362	International Negotiations	
COM 375 [WI]	Grant Writing	
ECON 301	Microeconomics	
ECON 321	Macroeconomics	
ECON 326 [WI]	Economic Ideas	
ECON 351	Resource and Environmental Economics	
ENGL 325	Topics in World Literature	
ENGL 360 [WI]	Literature and Society	
FIN 301	Introduction to Finance	
FIN 346	Global Financial Management	
IAS 320	Building Global Bridges	
IAS 360	Special Topics in World Civilization ***	
IAS 390	Special Topics in International Area Studies ***	
INTB 336	International Money and Finance	
INTB 338	Regional Studies in Economic Policies and International Business	
PSCI 255	International Political Economics	
PSCI 340	Politics of Developing Nations	
PSCI 351	International Organizations: The United Nations	
PSCI 352	Ethics and International Relations	
PSCI 357	The European Union	
MKTG 301	Introduction to Marketing Management	
MKTG 322	Advertising & Integrated Marketing Communications	
MKTG 351	Marketing for Non-Profit Organizations	
MKTG 357	Global Marketing	
SOC 220	Wealth and Power	
SOC 310	Topics in Political Sociology	
SOC 340	Globalization	
SOC 435	Seminar - Organization of American States **	
STAT 201	Introduction to Business Statistics	
STAT 202	Business Statistics II	

Electives 28-0

Total Credits 183.0-185.0

* Special topics courses with an international or relevant theme will be considered for course credit upon request and review.

** Repeatable for credit.

Justice and Human Rights

General Requirements

ANTH 101	Introduction to Cultural Diversity	3.0
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
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
ENGL 204	Post-Colonial Literature II	3.0
LING 102	Language and Society	3.0
PHIL 105	Critical Reasoning	3.0
PSCI 150	International Politics	4.0
CIVC 101	Introduction to Civic Engagement	1.0
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
One ethics course		3.0

IAS Core Curriculum Requirements

IAS 359	Culture and Values	3.0
IAS 360	Special Topics in World Civilization	3.0
IAS 190	Global Research Methods	3.0
WMST 240	Women and Society in a Global Context	3.0

Language Requirements

At least 4 language courses at the 300-level are required for graduation, with a minimum of 21 credits in at least one language. 21.0-36.0

Area-specific Courses

Students select two region specific courses approved by IAS. 6.0
Courses must focus on the same region, but can be in any discipline.

Justice and Human Rights Concentration Requirements

ANTH 310	Societies In Transition: The Impact of Modernization and the Third World	3.0
or SOC 330	Developing Nations and the International Division of Labor	
ENGL 360 [WI]	Literature and Society	3.0
PHIL 335	Global Ethical Issues	3.0
PSCI 120	History of Political Thought	4.0
PSCI 329	Theories of Justice	3.0
PSCI 352	Ethics and International Relations	3.0
PSCI 353	International Human Rights	4.0
SOC 260 [WI]	Classical Social Theory	3.0
Select one of the following:		3.0

PSCI 351 International Organizations: The United Nations

PSCI 357 The European Union

SOC 435 Seminar - Organization of American States

Justice and Human Rights Distribution Options **

Select eleven of the following: 33.0-38.0

AFAS 295	Special Topics in Africana Studies **
ANTH 312	Approaches to Intercultural Behavior
or COM 345	Intercultural Communication
ANTH 250	Anthropology of Immigration
CJ 289	Terrorism
COM 360	International Communication
COM 362	International Negotiations
COM 375 [WI]	Grant Writing
CULA 427	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
IAS 320	Building Global Bridges
IAS 360	Special Topics in World Civilization ***
IAS 390	Special Topics in International Area Studies ***
PHIL 241	Social & Political Philosophy
PHIL 341	Philosophy of the Environment
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 240	Comparative Government
PSCI 255	International Political Economics
PSCI 250	American Foreign Policy
PSCI 340	Politics of Developing Nations
PSCI 351	International Organizations: The United Nations
PSCI 357	The European Union
PSCI 365	Politics, Law, & Justice
PSCI 367	International Law
SOC 210	Race and Ethnic Relations
SOC 220	Wealth and Power
SOC 310	Topics in Political Sociology
SOC 315	HIV/AIDS and Africa
SOC 340	Globalization
SOC 344	Social Movements
SOC 346	Environmental Justice
SOC 435	Seminar - Organization of American States ***
WMST 280	Special Topics in Women's Studies ****

Electives 32.0-8.0

Total Credits 184.0

* Justice and Human rights related topics.

** Special topics courses with an international or relevant theme will be considered for course credit upon request and review.

*** Repeatable for credit.

**** Justice and Human rights related topics.

Literature, Culture and the Arts

General Requirements

ANTH 101	Introduction to Cultural Diversity	3.0
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
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
ENGL 204	Post-Colonial Literature II	3.0
LING 102	Language and Society	3.0
PHIL 105	Critical Reasoning	3.0
PSCI 150	International Politics	4.0
CIVC 101	Introduction to Civic Engagement	1.0
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
One ethics course		3.0

IAS Core Curriculum Requirements

IAS 359	Culture and Values	3.0
IAS 360	Special Topics in World Civilization	3.0
IAS 190	Global Research Methods	3.0
WMST 240	Women and Society in a Global Context	3.0

Language Requirements

At least 4 language courses at the 300-level are required for graduation, with a minimum of 21 credits in at least one language. 21.0-36.0

Area-specific Courses

Students select two region specific courses approved by IAS. Courses must focus on the same region, but can be in any discipline. 6.0

Literature, Culture and the Arts Requirements

ANTH 212 [WI]	Topics in World Ethnography	3.0
ANTH 312	Approaches to Intercultural Behavior	3.0
or COM 345	Intercultural Communication	
ENGL 325	Topics in World Literature	3.0
ENGL 360 [WI]	Literature and Society *	3.0
MUSC 331	World Musics	3.0
PHIL 231	Aesthetics	3.0
Select one of the following:		3.0

ARTH 101 History of Art I: Ancient to Medieval

ARTH 102 History of Art II: High Renaissance to Modern

ARTH 103 History of Art: Early to Late Modern

Language Minor thesis course

3.0

Literature Culture and the Arts Distribution Options **

Select eleven of the following:		33.0
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 410	Cultural Theory	

ARCH 141	Architecture and Society I
COM 210	Theory and Models of Communication
COM 342	English Worldwide
COM 355	Ethnography of Communication
COM 360	International Communication
COM 375 [WI]	Grant Writing
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]	Post-Colonial Literature I
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
FMST 265	Special Topics in Cinema Studies **
IAS 320	Building Global Bridges
IAS 360	Special Topics in World Civilization ***
IAS 390	Special Topics in International Area Studies ***
MUSC 130	Introduction to Music
NFS 446	Perspectives in World Nutrition
PHIL 211	Metaphysics
PHIL 241	Social & Political Philosophy
PHIL 335	Global Ethical Issues
PHIL 391	Philosophy of Religion
PSCI 120	History of Political Thought
PSCI 323	Comparative Political Thought
SOC 210	Race and Ethnic Relations
SOC 340	Globalization
WRIT 310	Literary Editing & Publication

Electives 39.0-20.0

Total Credits 186.0

Sample Plans of Study

(For concentrations in Global Science, Sustainability and Health, or Justice and Human Rights, please see your advisor.)

International Business and Economics

Term 1		Credits
ANTH 101	Introduction to Cultural Diversity	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV H101	The Drexel Experience	1.0
PHIL 105	Critical Reasoning	3.0
Language course		4.0
Term Credits		18.0

Term 2

ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
LING 102	Language and Society	3.0
MATH 102	Introduction to Analysis II	4.0
ECON 201	Principles of Microeconomics	4.0
Language course		4.0
Term Credits		18.0

Term 3

ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
ECON 202	Principles of Macroeconomics	4.0
IAS 190	Global Research Methods	3.0
PSCI 150	International Politics	4.0
Language course		4.0
CIVC 101	Introduction to Civic Engagement	1.0
Term Credits		19.0

Term 4

ENGL 204	Post-Colonial Literature II	3.0
WMST 240	Women and Society in a Global Context	3.0
Language course		4.0
Science elective *		3.0
One concentration distribution course		4.0
Term Credits		17.0

Term 5

Area-Specific history course		3.0
Language course		3.0
Two concentration distribution courses *		6.0
Science elective *		4.0
Term Credits		16.0

Term 6

INTB 334	International Trade	4.0
SOC 260 [WI]	Classical Social Theory	3.0
Ethics elective		3.0
Area-Specific history course		3.0
Term Credits		13.0

Term 7

ECON 342	Economic Development	4.0
IAS 360	Special Topics in World Civilization	3.0
PHIL 301	Business Ethics	3.0
SOC 330	Developing Nations and the International Division of Labor	3.0
or ANTH 310	Societies In Transition: The Impact of Modernization and the Third World	
Language course		3.0
Term Credits		16.0

Term 8

BLAW 340	International Business Law	4.0
INTB 332	Multinational Corporations	4.0
One concentration distribution course *		3.0
Language course		3.0
Term Credits		14.0

Term 9

INTB 338	Regional Studies in Economic Policies and International Business	4.0
ENGL 308	The Literature of Business [WI]	3.0
Language course		3.0
Two concentration distribution courses *		6.0
Term Credits		16.0

Term 10

Language course		3.0
Two concentration distribution courses *		6.0
Free elective		3.0
UNIV H201	Looking Forward: Academics and Careers	1.0
Term Credits		13.0

Term 11

IAS 359	Culture and Values	3.0
Language course		3.0
Concentration distribution course *		3.0
Free elective		3.0
Term Credits		12.0

Term 12

Two concentration distribution courses *		6.0
Language course		3.0
Free elective		3.0
Term Credits		12.0

Total Credit: 184.0**Literature, Culture and the Arts**

Term		Credits
Term 1		
ANTH 101	Introduction to Cultural Diversity	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV H101	The Drexel Experience	2.0
Language course		4.0
Term Credits		16.0

Term 2

ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
LING 102	Language and Society	3.0
MATH 102	Introduction to Analysis II	4.0
PHIL 105	Critical Reasoning	3.0
UNIV H101	The Drexel Experience	1.0
Language course		4.0
Term Credits		18.0

Term 3

ECON 201	Principles of Microeconomics	4.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
IAS 190	Global Research Methods	3.0
PSCI 150	International Politics	4.0
Language course		4.0

CIVC 101	Introduction to Civic Engagement	1.0	WMST 240	Women and Society in a Global Context	3.0
Term Credits		19.0	Language course		3.0
Term 4					
ANTH 212	Topics in World Ethnography	3.0	Literature, Culture & Arts distribution course*		3.0
[WI]			Free elective		3.0
ECON 202	Principles of Macroeconomics	4.0	UNIV H201	Looking Forward: Academics and Careers	1.0
Ethics elective		3.0	Term Credits		13.0
Science elective*		3.0	Term 11		
Language course		4.0	IAS 359	Culture and Values	3.0
Term Credits		17.0	Language course		3.0
Term 5					
MUSC 331	World Musics	3.0	Literature, Culture & Arts distribution course*		3.0
Literature, Culture & Arts distribution course*		3.0	Free elective		3.0
Area-specific course*		3.0	Term Credits		12.0
Science elective*		4.0	Term 12		
Language course		4.0	Two Literature, Culture & Arts distribution courses*		6.0
Term Credits		17.0	Language course		3.0
Term 6					
ENGL 360	Literature and Society	3.0	Free elective		3.0
[WI]			Term Credits		12.0
PHIL 231	Aesthetics	3.0	Total Credit: 185.0		
Select one of the following:		3.0	* See degree requirements.		
ARTH 101	History of Art I: Ancient to Medieval		Co-op/Career Opportunities		
ARTH 102	History of Art II: High Renaissance to Modern		Opportunities		
ARTH 103	History of Art: Early to Late Modern		Career placements include entry-level international marketing and communications positions with national and multinational business concerns in the United States and abroad. Other placements are with public and private international service organizations, advertising, and investment concerns, the Peace Corps, and local and national governmental agencies.		
Language course		4.0	Graduate admissions are in international relations, government, international law, public policy, the humanities, and MBA programs. Recent graduates have pursued advanced study at Yale, Harvard, Georgetown, Johns Hopkins, Cornell, Columbia, American University, the University of California, the Monterey Institute, the University of Pennsylvania, Drexel University, and the Woodrow Wilson School at Princeton University. International graduate admissions include the London School of Economics, the University of London, and Cambridge University in Britain; the Free University of Bonn and the University of Mannheim in Germany; the College of Europe in Belgium; and Ben Gurion University in Israel.		
Literature, Culture & Arts distribution course*		3.0	This degree is designed to provide preparation for entry-level careers in government, public relations, international advertising, and service agencies. The BA is also recommended for graduate study in fields such as law, international relations, public policy, political science, sociology, history, and economics.		
Term Credits		16.0	Co-Op Experiences		
Term 7					
COM 345	Intercultural Communication	3.0	Students in the major generally take cooperative education positions with international service organizations, law firms, investment concerns, and multinational corporations, both in the United States and abroad. In addition, students may elect independent study or study-internships abroad as partial fulfillment of cooperative education requirements.		
or ANTH 312	Approaches to Intercultural Behavior	3.0			
Two Literature, Culture & Arts distribution courses*		6.0			
Area-specific course*		3.0			
Language course		3.0			
Term Credits		15.0			
Term 8					
Free elective					
ENGL 204	Post-Colonial Literature II	3.0			
ENGL 360	Literature and Society	3.0			
[WI]					
Language course		3.0			
Two Literature, Culture & Arts distribution courses*		6.0			
Term Credits		15.0			
Term 9					
IAS 360	Special Topics in World Civilization	3.0			
ENGL 325	Topics in World Literature	3.0			
PHIL 335	Global Ethical Issues	3.0			
Language course		3.0			
Literature, Culture & Arts distribution course*		3.0			
Term Credits		15.0			
Term 10					

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

Minor in International Area Studies

The international area studies minor provides a cross-cultural, interdisciplinary frame of reference for students in other disciplines who are interested in careers in the international sector.

Language study through level 201 is a prerequisite for the minor.

Core Requirements

IAS 360	Special Topics in World Civilization	3.0
WMST 240	Women and Society in a Global Context	3.0

Students select one region specific HIS or PSCI courses approved by IAS.*

International Area Studies (IAS) Electives

Select five of the following: 15.0

AFAS 295	Special Topics in Africana Studies	
ANTH 212 [WI]	Topics in World Ethnography	
ANTH 220	Aging In Cross-Cultural Perspective	
ANTH 310	Societies In Transition: The Impact of Modernization and the Third World	
ANTH 312	Approaches to Intercultural Behavior	
ANTH 410	Cultural Theory	
BIO 264	Ethnobotany	
BLAW 340	International Business Law	
COM 342	English Worldwide	
COM 345	Intercultural Communication	
COM 355	Ethnography of Communication	
COM 360	International Communication	
COM 361	International Public Relations	
COM 390 [WI]	Global Journalism	
ECON 342	Economic Development	
ENGL 203 [WI]	Post-Colonial Literature I	
ENGL 204	Post-Colonial Literature II	
ENGL 323	Literature and Other Arts **	
ENGL 325	Topics in World Literature	
ENGL 360 [WI]	Literature and Society **	
HIST 290	Technology and the World Community	
IAS 320	Building Global Bridges	
IAS 390	Special Topics in International Area Studies ***	
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	
PHIL 335	Global Ethical Issues	
PSCI 120	History of Political Thought	
PSCI 240	Comparative Government	

PSCI 255	International Political Economics	
PSCI 323	Comparative Political Thought	
PSCI 340	Politics of Developing Nations	
PSCI 351	International Organizations: The United Nations	
PSCI 352	Ethics and International Relations	
PSCI 353	International Human Rights	
PSCI 357	The European Union	
PSCI 367	International Law	
SOC 220	Wealth and Power	
SOC 330	Developing Nations and the International Division of Labor	
SOC 344	Social Movements	
SOC 346	Environmental Justice	
SOC 435	Seminar - Organization of American States	
WMST 280	Special Topics in Women's Studies **	
Total Credits		24.0

* Typically an region-specific history course is determined by what language the student is studying.

** These courses must have an international focus.

*** Special topics courses with an international or relevant theme will be considered for course credit upon request and review.

The programs in modern languages offer a language minor in Chinese, French, German, Italian, Japanese, Russian, and Spanish.

IAS Advisory Board Faculty

Interdepartmental Faculty

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

Anne C. Cecil, MA (*University of the Arts*) Program Director, *Design & Merchandising*. Associate Teaching Professor. Web designer, product designer, merchandising and artist.

George Ciccarriello-Maher, PhD (*University of California, Berkeley*). Assistant Professor. Colonialism, social movements, political theory.

Mary Ebeling, PhD (*University of Surrey*). 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*). Associate Professor. Environmental policy and comparative politics.

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

Christopher A. Laincz, PhD (*Duke University*) Department of *Economics and International Business*. Associate Professor. Economic development, technological change, and growth, industrial organization, macroeconomics and monetary economics.

Maria delaluz Matus-Mendoza, PhD (*Temple University*). 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*). Associate 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.

Julie Mostov, PhD (*New York University*) *Associate Vice Provost for International Programs*. Professor. Modern political thought, democratic theory, nationalism, gender studies, South Eastern Europe and the Balkans.

Anne-Marie Obajtek-Kirkwood, PhD (*University of Pennsylvania*). Associate Professor. French and francophone 20th and 21st century literature, culture and film. Representations of the Occupation (WWII); war; minorities in France; autobiography; feminist issues.

Joel E. Oestreich, PhD (*Brown University*) *Director of International Area Studies*. Associate Professor. International organizations, international finance, development, and human rights.

Marilyn Gaye Piety, PhD (*McGill University*). Associate Professor. History of philosophy, philosophy of religion, critical reasoning, Kierkegaard.

Abioseh Michael Porter, PhD (*University of Alberta*) *Department Head, English and Philosophy*. Professor. Comparative literature; postcolonial literatures; Editor, *JALA, Journal of the African Literature Association*.

Rachel R. Reynolds, PhD (*University of Illinois at Chicago*). Associate Professor. Sociolinguistics, ethnography of communication, intercultural communication, globalization and the rhetoric of community, political economy of immigration, race and ethnicity, new African immigrants in the United States, Igbo studies.

Simone Schlichting-Artur, EdD (*University of Pennsylvania*) *Assistant Department Head, Culture and Communication*. 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 (*Temple University*) *Department Head, Culture and Communication*. Professor. Ethnography of cyberspace, online learning communities, political economy of higher education, globalization, activity theory, semiotics, critical realism, psychoanalysis, identity and the self.

Courses

IAS 190 Global Research Methods 3.0 Credits

Introduction to research and writing in International Area Studies. It covers quantitative, qualitative, and mixed approaches to IAS research. Students learn to use international studies research databases and the websites of international organization. Drawing on the content areas from the four IAS 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

Restrictions: Can enroll if major is IAS.

IAS 225 Women and Human Rights Worldwide 3.0 Credits

Women's human rights emerged in the 1980's 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

IAS 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

IAS 235 African Francophone Women Writers 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

IAS 260 Evil Isms 3.0 Credits

From antisemitism to totalitarianism in the name of religion or politics (communism, nazism) to terrorism, this course focuses on prejudices and ideologies, how they variously expressed themselves negatively throughout time and space to the present, how they have been counteracted or still, always, do need counteracting.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

IAS 320 Building Global Bridges 3.0 Credits

This course is designed to develop an understanding of international development. Students learn about the practical challenges of development work from local needs to grant writing, fund-raising, implementation strategies, and project evaluation. They study the theoretical and practical frameworks for poverty reduction and democracy development as well as the agencies involved.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

IAS 359 Culture and Values 3.0 Credits

This course provides an in-depth comparative study of the historical, social and cultural imperatives of major world civilizations, with particular emphasis on the philosophical and cultural diversity of today's global society. This class is required for, and restricted to, IAS majors. Students will also be guided through the process of writing a thesis on a topic of interest to them, and that builds on their experience as an IAS major.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if major is IAS and classification is Senior.

IAS 360 Special Topics in World Civilization 3.0-12.0 Credits

This is an interdisciplinary seminar designed to give students an understanding of the modern cultural attitudes, ethical values, and sociopolitical norms of major civilizations in a given geographical area and their relationship to one another. May be repeated for credit with a change in course topic. Required for the B.A. degree in International Area Studies.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 3 times for 9 credits

Restrictions: Cannot enroll if classification is Freshman

IAS 370 Iran Then and Now 3.0 Credits

This course explores some of Iran's past (18th and 19th centuries) but focuses on the 20th and 21st centuries. Politics, culture, religion, literature and film will be studied through Iranian eyes.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

IAS 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

IAS 390 Special Topics in International Area Studies 1.0-6.0 Credit

This course explores critical issues and debates in International Area Studies. Topics vary each term. May be repeated three times for credit.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 8 times for 30 credits

Restrictions: Cannot enroll if classification is Freshman

IAS 399 Independent Study in International Area Studies 1.0-12.0 Credit

This course provides independent study in a topic related to International Area Studies.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Restrictions: Cannot enroll if classification is Freshman

The Louis Stein Minor in Judaic Studies

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: 9.0 from required courses, and 15.0 from electives. Students can apply a maximum of 6.0 credits toward the minor from field study under the supervision of the academic advisor.

Required Courses

JUDA 201	Jewish Literature and Civilization *	3.0
JUDA 202	Jewish Life and Culture in the Middle Ages **	3.0
JUDA 203	Modern Jewish History †	3.0
Minor electives		15.0
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 American Jewish Experience
- JUDA 212 [WI] Contemporary Jewish Life
- JUDA 213 Jewish Cultural Tapestry
- JUDA 214 Language and Cultural Diversity in the USA
- JUDA 215 Reconstructing History After Genocide
- JUDA 216 Yiddish Literature and Culture
- JUDA 280 Special Topics in Judaic Studies
- JUDA 298 Field Work in Judaic Studies
- JUDA 299 Independent Study in Judaic Studies
- ANTH 120 Biblical Archeology of Israel and Jordan
- ANTH 380 Special Topics in Anthropology (When offered as Archeology of the Middle East)
- HBRW 101 Introduction to Hebrew I
- HBRW 102 Introduction to Hebrew II
- HBRW 103 Introduction to Hebrew III
- HBRW 201 Intermediate Hebrew IV
- HBRW 202 Intermediate Hebrew V
- HBRW 203 Intermediate Hebrew VI
- ENGL 395 [WI] Special Studies in Literature (When offered as Jewish Women in Literature and History)
- ENGL 323 Literature and Other Arts (When offered as Holocaust Testimonies)
- ENGL 345 American Ethnic Literature (When offered as Jewish American Writers)
- ENGL 325 Topics as World Literature (When offered as Israeli Literature & Culture, or as Yiddish Literature & Culture)
- LANG 180 Special Topics in Languages (When offered as Yiddish Language I)
- LANG 180 Special Topics in Languages (When offered as Yiddish Language II)

For more information about the Louis Stein Minor in Judaic Studies, please contact:

Kathleen Carll
Associate Director
Judaic Studies Program
215-895-6388
judaicstudies@drexel.edu

Professor Rakhmiel Peltz
Director of Judaic Studies
215-895-1499
rakhmiel.peltz@drexel.edu

The Judaic Studies Program offices are located in Room 331 of Hagerty Library.

Courses

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 3.0 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 3.0 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 280 Special Topics in Judaic Studies 3.0 Credits

In this course, students will explore specific areas not covered in the regularly offered Judaic Studies courses. The course will be taught by teaching faculty members of the Judaic Studies Program, Drexel professors who are members of the Judaic Studies Faculty Committee, or by visiting professors. 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 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 299 Independent Study in Judaic Studies 3.0 Credits

In this course, students will work under the direction of the director of the Judaic Studies program, one of the Judaic Studies teaching faculty members, or a member of the Judaic Studies Faculty Committee. The subject matter will cover a specific research area in Judaic Studies or an area of academic study not offered in an existing Judaic Studies course. Only students with sufficient background work will be accepted by the faculty member for independent work. 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

Mathematics

Bachelor of Arts Degree: 180.0 quarter credits

Bachelor of Science Degree: 180.0 quarter credits

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://www.drexel.edu/math>) 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)

General Education Requirements

UNIV S101	The Drexel Experience	1.0
CIVC 101	Introduction to Civic Engagement	1.0
UNIV S201	Looking Forward: Academics and Careers	1.0
COM 230	Techniques of Speaking	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0

One of the following Computer Science sequences:

Option I		
CS 140	Introduction to Multimedia Programming	
CS 143	Computer Programming Fundamentals	
CS 171	Computer Programming I	
Option II		
CS 140	Introduction to Multimedia Programming	
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 (depending upon other options selected)

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	

Additional Mathematics Requirements

Track Courses 9.0-11.0

Select one of the following sequences:

MATH 221 & MATH 316 & MATH 332	Discrete Mathematics and Mathematical Applications of Symbolic Software and Abstract Algebra II
MATH 321 & MATH 322 & MATH 402	Vector Calculus and Complex Variables and Elements of Modern Analysis II
MATH 300 & MATH 301 & MATH 305	Numerical Analysis I and Numerical Analysis II and Introduction to Optimization Theory
MATH 311 & MATH 312 & MATH 318	Probability and Statistics I and Probability and Statistics II and Mathematical Applications of Statistical Software
MATH 205 & MATH 311 & MATH 312	Survey of Geometry and Probability and Statistics I and Probability and Statistics II
Four Mathematics Courses **	12.0
Three Mathematics Related Courses ***	9.0
Total Credits	181.0-184.0

- * Math majors must pass MATH 121 with a grade of B or higher.
- ** Students either select these courses from the list of MATH courses in for the BS in Mathematics or from additional mathematics electives, provided that approval is obtained in advance from the undergraduate mathematics advisor. The following courses cannot be counted toward the BA in Mathematics: MATH 004, MATH 100, MATH 101, MATH 102, MATH 110, MATH 119, MATH 180, MATH 181, MATH 182, MATH 183, and MATH 239. In addition, MATH 291 doesn't count towards the math electives if MATH 321 and MATH 322 are taken.
- *** Students must complete three additional courses in fields related to mathematics such as science, engineering, economics, finance, decision sciences, and computer science. A list of approved courses will be maintained by the undergraduate mathematics advisor. These three courses are in addition to the two science courses required as part of the General Education requirements, as well as the required CS sequence.

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, criminal justice, 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 studies.

Sample Plan of Study (BA)

5-year co-op sequence

Term 1		Credits
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
MATH 121	Calculus I	4.0
UNIV S101	The Drexel Experience	1.0
	Computer Science (CS) sequence course *	3.0
	Science elective	3.0-4.0
Term Credits		14.0-15.0
Term 2		
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
MATH 122	Calculus II	4.0
	Computer Science (CS) sequence course *	3.0
	Science elective	3.0-4.0
CIVC 101	Introduction to Civic Engagement	1.0
Term Credits		14.0-15.0
Term 3		
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
MATH 123	Calculus III	4.0
MATH 220	Introduction to Mathematical Reasoning [W]	3.0
	Computer Science (CS) sequence course *	3.0
	Social 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) course *	3.0
	Course in math-related field **	3.0
	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 science elective	3.0
	Humanities/Fine arts elective	3.0
	Free elective	3.0
Term Credits		16.0

Term 7

Mathematics (MATH) sequence option*	3.0
Diversity studies elective	3.0
Free electives	9.0

Term Credits **15.0**

Term 8

MATH 401 Elements of Modern Analysis I or 331 Abstract Algebra I	3.0
Course in a math-related field**	3.0
International studies elective	3.0
Free electives	6.0

Term Credits **15.0**

Term 9

Mathematics sequence option*	3.0
Course in a math-related field**	3.0
Free electives	10.0
UNIV S201 Looking Forward: Academics and Careers	1.0

Term Credits **17.0**

Term 10

Mathematics (MATH) course*	4.0
Free electives	12.0

Term Credits **16.0**

Term 11

Mathematics sequence option*	3.0
Free electives	10.0

Term Credits **13.0**

Term 12

Mathematics (MATH) course*	3.0
Free electives	10.0

Term Credits **13.0**

Total Credit: 181.0-183.0

* See degree requirements.

Students select these courses from the list of Mathematics (MATH) requirements/electives listed in the degree requirements, or can suggest additional mathematics electives, provided that approval is obtained *in advance* from the undergraduate mathematics advisor. The following courses **cannot** be counted toward the BA in Mathematics: [MATH 004](#), [MATH 100](#), [MATH 101](#), [MATH 102](#), [MATH 110](#), [MATH 119](#), [MATH 180](#), [MATH 181](#), [MATH 182](#), [MATH 183](#), and [MATH 239](#).

** Students must complete three courses in fields related to mathematics such as science, engineering, economics, finance, decision sciences, and computer science. A list of approved courses will be maintained by the undergraduate mathematics advisor. These three courses are in addition to the two science courses required as part of the General Education requirements, as well as the Computer Science (CS) required sequence.

Degree Requirements (BS)**General Education Requirements**

UNIV S101	The Drexel Experience	1.0
CIVC 101	Introduction to Civic Engagement	1.0
UNIV S201	Looking Forward: Academics and Careers	1.0
COM 230	Techniques of Speaking	3.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0

One of the following Computer Science sequences: 9.0

Option I

CS 140	Introduction to Multimedia Programming
CS 143	Computer Programming Fundamentals
CS 171	Computer Programming I

Option II

CS 140	Introduction to Multimedia Programming
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	9.0
Social sciences electives	18.0
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 (10-14 classes) from the following:

MATH 205	Survey of Geometry
MATH 221	Discrete Mathematics
MATH 235	Math Competition Problem Solving Seminar
MATH 238	History of Mathematics
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	Mathematical Applications of Statistical Software [WI]	
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 475	Cryptography	
Total Credits		181.0-184.0

* Math majors must pass MATH 121 with a grade of B or higher.

Sample Plan of Study (BS)

This is a recommended plan, illustrating the five-year co-op sequence. Additional recommended plans of study for other co-op options are available from the department.

First Year

Term 1		Credits
UNIV S101	The Drexel Experience	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
MATH 121	Calculus I	4.0
Computer Science (CS) course sequence*		3.0
Any Biology (BIO) course		3.0
Term Credits		14.0

Term 2

CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
MATH 122	Calculus II	4.0
Computer Science (CS) sequence course*		3.0
Any Chemistry (CHEM) course		3.0
Term Credits		14.0

Term 3

ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
MATH 123	Calculus III	4.0
MATH 200	Multivariate Calculus	4.0
Computer Science (CS) sequence course*		3.0
Any Physics (PHYS) course		3.0-4.0
Term Credits		17.0-18.0

Second Year

Term 4

COM 230	Techniques of Speaking	3.0
MATH 201	Linear Algebra	4.0
MATH 220	Introduction to Mathematical Reasoning [WI]	3.0
Social Science Electives		6.0
Term Credits		16.0

Term 5

Social Science Elective		3.0
MATH 210	Differential Equations	4.0
Mathematics (MATH) elective**		3.0
Humanities Elective		3.0
Term Credits		13.0

Third Year

Term 6

MATH 331	Abstract Algebra I	4.0
Mathematics (MATH) elective**		4.0
Social Science Elective		3.0
Humanities elective		3.0
Term Credits		14.0

Term 7

MATH 332	Abstract Algebra II	3.0
Mathematics (MATH) elective**		4.0
Humanities elective		3.0
Social science elective		3.0
Free elective		3.0
Term Credits		16.0

Fourth Year

Term 8

MATH 401	Elements of Modern Analysis I	3.0
Mathematics (MATH) elective**		3.0
Social science elective		3.0
Free electives		6.0
Term Credits		15.0

Term 9

UNIV S201	Looking Forward: Academics and Careers	1.0
MATH 402	Elements of Modern Analysis II	3.0
Mathematics (MATH) electives**		7.0
Free electives		6.0
Term Credits		17.0

Fifth Year

Term 10

Mathematics (MATH) electives **	8.0
Free electives	7.0-8.0

Term Credits	15.0-16.0
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Term 11

Mathematics (MATH) electives **	7.0
Free electives	8.0

Term Credits	15.0
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Term 12

Mathematics (MATH) electives **	6.0
Free electives	9.0-10.0

Term Credits	15.0-16.0
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Total Credit: 181.0-184.0

* See degree requirements.

** Select from MATH 205, MATH 221, MATH 235, MATH 238, MATH 285, MATH 291, 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 475.

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.

Minor in Mathematics

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	
Total credits		19.0-20.0

Mathematics Minor Electives **

Select from the following: 18.0-19.0

MATH 205	Survey of Geometry	
MATH 210	Differential Equations *	
or MATH 262	Differential Equations	
MATH 220	Introduction to Mathematical Reasoning [WI]	
MATH 221	Discrete Mathematics	
MATH 235	Math Competition Problem Solving Seminar	
MATH 285	Differential Equations II	
MATH 286	Applied Differential Equations	
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	Mathematical Applications of Statistical Software [WI]	
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 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	
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 at advisor@math.drexel.edu.
- *** Students who take MATH 291 cannot also count MATH 321 or MATH 322 toward their minor.

Mathematics Faculty

David M. Ambrose, PhD (*Duke University*) Associate Department Head of the Mathematics Department. Associate Professor. Applied analysis and computing for systems of nonlinear partial differential equations, especially free-surface problems in fluid dynamics.

Jason Aran, MS (*Drexel University*). Assistant Teaching Professor.

Jonah D. Blasiak, PhD (*University of California at Berkeley*). Assistant Professor. Algebraic combinatorics, representation theory, and complexity theory.

Robert P. Boyer, PhD (*University of Pennsylvania*) Interim Associate Head of the Mathematics Department. Professor. Functional analysis, C^* -algebras and the theory of group representations.

Patrick Clarke, PhD (*University of Miami*). Assistant Professor. Homological mirror symmetry, Landau-Ginzburg models, algebraic geometry, symplectic geometry.

Daryl Falco, MS (*Drexel University*). Assistant Teaching Professor. Discrete mathematics and automata theory.

Raymond J. Favocci, III, MS (*Drexel University*). Assistant Teaching Professor.

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*). Assistant 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 and optical design.

Pawel Hitczenko, PhD (*Warsaw University*). Professor. Probability theory and its applications to analysis, combinatorics, wavelets, and the analysis of algorithms.

Robert Immordino, MS (*Drexel University*). Assistant Teaching Professor.

Dmitry Kaliuzhnyi-Verbovetskyi, PhD (*Kharkov National University*). Associate Professor. Operator theory, systems theory, complex analysis, C^* -algebras and harmonic analysis.

Hwan Yong Lee, PhD (*University of Utah*). Assistant Teaching Professor. Electromagnetic wave propagation in composite media, optimization and inverse problem.

Huilan Li, PhD (*York University*). Assistant Teaching Professor. Algebraic combinatorics.

Georgi S. Medvedev, PhD (*Boston University*). Associate Professor. Ordinary and partial differential equations, mathematical neuroscience.

Jennifer Morse, PhD (*University of California, San Diego*) Undergraduate Advisor. Professor. Algebraic combinatorics.

Shari Moskow, PhD (*Rutgers University*) Associate Head of the Mathematics Department. Professor. Partial differential equations and numerical analysis, including homogenization theory, numerical methods for problems with rough coefficients, and inverse problems.

Marna A. Mozeff, MS (*Drexel University*). Associate Teaching Professor.

Oksana P. Odintsova, PhD (*Omsk State University*). Associate Teaching Professor. Math education.

Dimitrios Papadopoulos, MS (*Drexel University*). Instructor.

Ronald K. Perline, PhD (*University of California at Berkeley*). 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.

Patricia Henry Russell, MS (*Drexel University*). Teaching Professor. Probability and statistics.

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*). Assistant Professor. Partial differential equations, scientific computing and applied mathematics.

Justin R. Smith, PhD (*Courant Institute, New York University*). Professor. Homotopy theory, operad theory, quantum mechanics, quantum computing.

Jeanne M. Steuber, MS (*Boston University*). Assistant Teaching Professor.

Kenneth P. Swartz, PhD (*Harvard University*). Assistant Teaching Professor. Applied statistics, data analysis, calculus, discrete mathematics, biostatistics.

Vaishalee T. Wadke, MS (*Columbia University*). Instructor.

Richard D. White, MS (*Penn State University*). Assistant Teaching Professor.

Hugo J. Woerdeman, PhD (*Vrije Universiteit, Amsterdam*) Department Head, Department of Mathematics. Professor. Matrix and operator theory, systems theory, signal and image processing, and harmonic analysis.

J. Douglas Wright, PhD (*Boston University*) Graduate Advisor. Associate Professor. Partial differential equations, specifically nonlinear waves and their interactions.

Dennis G. Yang, PhD (*Cornell University*). Assistant 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.

Emeritus Faculty

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.

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.

Jet Wimp, PhD (*University of Edinburgh*). Professor Emeritus. Applied mathematics, special factors, approximation theory, numerical techniques, asymptotic analysis.

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 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: APEM 061 or MATH 100 [Min Grade: D]

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]

Corequisite: EXAM 080

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 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

Prerequisites: APEN 070 or MATH 100 [Min Grade: D]

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 or Sophomore .

Corequisite: EXAM 082

MATH 119 Mathematical Foundations for Design 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, transcendental functions, and applications.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if classification is Freshman or Sophomore .

Prerequisites: APC 070 or APC2 070 or MATH 110 [Min Grade: D]

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: D]

Corequisite: EXAM 080

MATH 123 Calculus III 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 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]

MATH 181 Mathematical Analysis I 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 182 [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]

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: D] or CS 270 [Min Grade: D] or ECE 200 [Min Grade: D]

Corequisite: EXAM 081

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

Restrictions: Can enroll if classification is Freshman.

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 279 Special Topics in Mathematics 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 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 286 Applied Differential Equations 3.0 Credits

Reviews basic methods, including applications to electric circuits, chemical mixtures, mechanics, and motion problems. Introduces partial differential equations. Spring. Alternate years.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: MATH 285 [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 polynomial and trigonometric interpolation, splines, numerical linear algebra, numerical quadrature, solutions of nonlinear equations, and nonlinear optimization. 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] 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]

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]

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]

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 382 Advanced Calculus 3.0 Credits

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

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: or MATH 201 [Min Grade: D], 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 200 [Min Grade: D] or MATH 201 [Min Grade: D]

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] and MATH 221 [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] and MATH 311 [Min Grade: D]

MATH 480 Special Topics in Mathematics 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

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. Spring.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: MATH 385 [Min Grade: D]

MATH 489 Tensor Analysis 3.0 Credits

Covers tensor algebra, including coordinate transformations, fundamental quadratic form, covariant and contravariant tensors, Riemannian metric, and applications. Elective. Spring. Alternate years.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: MATH 381 [Min Grade: D]

MATH 497 Independent Study in Mathematics 0.5-12.0 Credits

Provides supervised study of selected topics in mathematics.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Restrictions: Cannot enroll if classification is Freshman

MATH 498 Special Topics 12.0 Credits

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

MATH 499 Independent Study in Mathematics 6.0 Credits

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Minors in Modern Languages

24.0 quarter credits of language study above the 103 level.

Minors in Arabic, Chinese, French, German, Italian, Japanese, Korean, Russian, and Spanish are offered. All beginner and intermediate courses are oral-intensive, with additional hours required with online coursework. Advanced courses focus on writing skills and do not always require lab work. Arabic, Chinese, Japanese, Korean and Russian include individual oral examinations at the end of each term.

In Western languages, enrollments are limited to 15 to 18 students in the first two years of study; third and fourth-year courses use a seminar format, with a usual enrollment of four to eight students. Arabic, Chinese, Japanese, Korean, and Russian are taught in a tutorial or "self-instructional" format, with enrollments limited to three to six students. Examinations in these languages are primarily oral and are administered by external examiners appointed by the University. All instructors in Arabic, Chinese, Japanese, Korean, and Russian, and most instructors in Western languages are native speakers.

Language study is open to all undergraduate students in the University, and validation of minimal language competence is required for cooperative education placement abroad in countries where English is not the national language. Study for two or three consecutive terms at or above 201 is the minimum requirement for the BA degree, as a total of 8.0 credits must be completed, but additional language course work is required by most departments offering this degree.

Students are placed in language courses in accordance with language placement testing administered during freshman orientation and at the beginning of each quarter. Students who do not take advantage of this option must comply with the department's enrollment guidelines.

Course Descriptions

- Arabic
- Chinese
- French
- German
- Greek
- Hebrew
- Italian
- Japanese
- Korean
- Russian
- Spanish

Certification of Proficiency

Drexel offers an advanced-level Certification of Proficiency for students who have successfully completed 24.0 credits of coursework and passed the series of written Proficiency examinations and an extensive FSI/ACTFL oral examination with at least an FSI "2" or ACTFL "Advanced" rating. Certification is listed on the student transcript. The different Proficiency exams can be taken once the student has satisfactorily passed the Achievement Test. They are also the prerequisite before starting a minor thesis.

Western languages

- 24 credits of language study above the 103 level
- Certification of Proficiency
- Minor thesis in the target language (1.0-4.0 credits possible)
- Oral defense of the minor thesis

Advanced Conversation and Composition

201-203

Stylistics, Advanced Stylistics

311 WI

312 WI

411

Literature, Advanced Studies in Literature

332

333

Business and the Professions

351

Advanced Topics in Business and Professions: European Union

451

Advanced Studies in Civilization

371

471 WI

Special Topics: Business and Civilization (may be repeated for credit.)

399 WI

499 WI

Non-western languages

- 24 credits of language study above the 103 level
- Minor thesis in the target language (1.0-4.0 credits possible)
- Oral defense of the minor thesis

Course options (subject to placement level)

Advanced reading, writing, and speaking. Levels IV-VI

201-203

Stylistics, Levels VII-IX

301-303

Advanced Independent Study

399 WI

Introduction to Stylistics, Literature

411 WI

431 WI

Introduction to Business

451

FREN 451	Special Studies in Advanced Business and Professional French	4.0
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RUSS 499	Special Topics in Russian	12.0
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Additional Information

For more information about all language minors, contact the Program Director:

Dr. Simone Schlichting-Artur

215.895.2443

schlichs@drexel.edu

Philosophy

Bachelor of Arts Degree: 182.0 - 188.0 credits

About the Program

The Drexel philosophy program is organized around the idea that the study of philosophy should help students confront life's most difficult and complex challenges, including those of work. 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. But it is particularly valuable as a preparation for careers in the 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).

During their first two years, Drexel philosophy majors take a sequence of historical and topical introductions into the foundational fields of western philosophy. These fields include ethics, metaphysics (philosophy of reality), epistemology (philosophy of knowledge), aesthetics (philosophy

of art and beauty), and logic. In their third year, majors begin taking seminar classes, which are discussion-driven, reading- and writing-intensive classes of 8 to 12 students. During senior year, majors complete a year-long, self-designed research and writing project, culminating in the defense of a Senior Thesis 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 48 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 credits) and certificate programs in Philosophy in the Arts and Humanities and Philosophy in Science and Technology, (18 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 and Philosophy is located in MacAlister Hall, room 5044. You can contact the director directly at:

Dr. Peter Amato

Director of Programs in Philosophy

Department of English and Philosophy

MacAlister 5030

215-895-1353

peterama@drexel.edu

Degree Requirements

College of Arts and Sciences Requirements

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
CHEM 201	Why Things Work: Everyday Chemistry	3.0
CIVC 101	Introduction to Civic Engagement	1.0
MATH 101	Introduction to Analysis I *	4.0
MATH 102	Introduction to Analysis II **	4.0
PHIL 105	Critical Reasoning	3.0
PHYS 135	How Things Work	4.0
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		6.0-8.0
Four Social and Behavioral Sciences Electives		12.0-16.0
Select two of the following:		6.0
ARTH 101	History of Art I: Ancient to Medieval	
ARTH 102	History of Art II: High Renaissance to Modern	
ARTH 103	History of Art: Early to Late Modern	

Language Requirement

201 Language Course †	4.0
202 Language Course	4.0

Major Requirements

COM 230	Techniques of Speaking	3.0
PHIL 101	Introduction to Western Philosophy	3.0
PHIL 111	Propositional Logic	3.0
PHIL 207	Predicate Logic	3.0
PHIL 211	Metaphysics	3.0
PHIL 221	Epistemology	3.0
PHIL 212	Ancient Philosophy	3.0
PHIL 214	Modern Philosophy	3.0
PHIL 215	Contemporary Philosophy	3.0
PHIL 231	Aesthetics	3.0
PHIL 251	Ethics	3.0
PHIL 361	Philosophy of Science	3.0
PHIL 431 [WI]	Seminar in Modern Philosophy	3.0
PHIL 481 [WI]	Seminar in a Philosophical School †	3.0
PHIL 485 [WI]	Seminar in a Major Philosopher †	3.0
PHIL 497 [WI]	Senior Essay I: Research & Thesis	3.0
PHIL 498 [WI]	Senior Essay II: Argument Construction	3.0
PHIL 499 [WI]	Senior Essay III: Defense	3.0
PHIL 391	Philosophy of Religion	3.0
or PHIL 371	Philosophy of Social Sciences	
PHIL 421 [WI]	Seminar in Ancient Philosophy	3.0
or PHIL 425	Seminar in Medieval Philosophy	
PHIL 461 [WI]	Seminar in Contemporary Philosophy	3.0
or PHIL 465	Seminar in American Philosophy	

Professional Ethics Elective

Select one of the following:	3.0	
PHIL 301	Business Ethics	
PHIL 305	Communication Ethics	
PHIL 311	Computer Ethics	
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	Ethical Issues in Criminal Justice	
PHIL 335	Global Ethical Issues	
PHIL 340	Environmental Ethics	

Electives

Free Electives	48.0
Total Credits	182.0-188.0

* Credit will be granted to students who achieve Advanced Placement (AP) in relevant mathematical disciplines. On the other hand, students unprepared for MATH 101 should take MATH 100 Fundamentals of Mathematics.

** Students who took MATH 100 in Term 1 must take MATH 101 in Term 2, and MATH 102 in Term 3 or Term 4.

† Presupposes a level of success in the placement examination warranting enrollment at this language level. Students are encouraged to pursue language instruction in “the languages of Western Philosophy;” thus, French, German, Italian and Spanish would be recommended. However, pursuit of proficiency in languages other than those recommended would not be discouraged. Credit will be granted to students who achieve Advanced Placement (AP) in a language.

‡ This course may be repeated for credit.

Sample Plan of Study

Term 1		Credits
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
MATH 101	Introduction to Analysis I	4.0
PHIL 101	Introduction to Western Philosophy	3.0
PHIL 105	Critical Reasoning	3.0
UNIV H101	The Drexel Experience	1.0
Term Credits		14.0
Term 2		
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
MATH 102	Introduction to Analysis II	4.0
PHIL 251	Ethics	3.0
Language 201		4.0
Term Credits		15.0
Term 3		
CHEM 201	Why Things Work: Everyday Chemistry	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
PHIL 111	Propositional Logic	3.0
Language 202		4.0
Social science elective		3.0-4.0
Term Credits		16.0-17.0
Term 4		
ARTH 101	History of Art I: Ancient to Medieval	3.0
PHIL 207	Predicate Logic	3.0
PHIL 212	Ancient Philosophy	3.0
Social science elective		3.0-4.0
Diversity studies elective		3.0
Term Credits		15.0-16.0
Term 5		
ARTH 102	History of Art II: High Renaissance to Modern	3.0
PHIL 211	Metaphysics	3.0
PHIL 214	Modern Philosophy	3.0
PHYS 135	How Things Work	4.0
Diversity studies elective		3.0
Term Credits		16.0
Term 6		
COM 230	Techniques of Speaking	3.0
PHIL 215	Contemporary Philosophy	3.0
PHIL 221	Epistemology	3.0

Social science elective	3.0-4.0
Free elective	3.0
Term Credits	15.0-16.0

Term 7

PHIL 231 Aesthetics	3.0
Professional ethics elective*	3.0
Free electives	6.0
Social science elective	3.0-4.0
Term Credits	15.0-16.0

Term 8

PHIL 361 Philosophy of Science	3.0
PHIL 481 [WI] Seminar in a Philosophical School	3.0
Free electives	6.0
International studies elective	3.0-4.0
Term Credits	15.0-16.0

Term 9

PHIL 485 [WI] Seminar in a Major Philosopher	3.0
Free Electives	9.0
International Studies Elective	3.0-4.0
Term Credits	15.0-16.0

Term 10

PHIL 421 [WI] Seminar in Ancient Philosophy	3.0
PHIL 497 [WI] Senior Essay I: Research & Thesis	3.0
UNIV H201 Looking Forward: Academics and Careers	1.0
Free electives	6.0
Term Credits	13.0

Term 11

PHIL 431 [WI] Seminar in Modern Philosophy	3.0
PHIL 498 [WI] Senior Essay II: Argument Construction	3.0
Free electives	9.0
Term Credits	15.0

Term 12

PHIL 391 Philosophy of Religion	3.0
PHIL 461 [WI] Seminar in Contemporary Philosophy	3.0
PHIL 499 [WI] Senior Essay III: Defense	3.0
Free electives	9.0
Term Credits	18.0

Total Credit: 182.0-188.0

* Complete a course within this range: PHIL 301 - PHIL 340.

Minor in Philosophy

This minor is intended for undergraduates seeking to broaden and enhance their education by attaining a firm grounding in philosophy. The minor requires seven carefully-selected classes, plus one of the senior seminars. Students who have completed 30.0 credits may apply for the philosophy minor by submitting the Application for Admission to Minor Program form, available online at the Drexel Central (<http://www.drexel.edu/src>) website.

Required Courses

PHIL 101	Introduction to Western Philosophy	3.0
PHIL 211	Metaphysics	3.0

PHIL 221	Epistemology	3.0
PHIL 251	Ethics	3.0
Select one of the following:		3.0

PHIL 105 Critical Reasoning

PHIL 111 Propositional Logic

Select one of the following Professional Ethics courses: 3.0

PHIL 301 Business Ethics

PHIL 305 Communication Ethics

PHIL 311 Computer Ethics

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 Ethical Issues in Criminal Justice

PHIL 335 Global Ethical Issues

Select one of the following: 3.0

PHIL 231 Aesthetics

PHIL 241 Social & Political Philosophy

PHIL 351 Philosophy of Technology

PHIL 341 Philosophy of the Environment

PHIL 355 Philosophy of Medicine

PHIL 361 Philosophy of Science

PHIL 371 Philosophy of Social Sciences

PHIL 381 [WI] Philosophy in Literature

PHIL 385 Philosophy of Law

PHIL 391 Philosophy of Religion

Select one of the following: 3.0

PHIL 421 [WI] Seminar in Ancient Philosophy

PHIL 425 [WI] Seminar in Medieval Philosophy

PHIL 431 [WI] Seminar in Modern Philosophy

PHIL 461 [WI] Seminar in Contemporary Philosophy

Total Credits 24.0**Additional Information**

For more information about the Drexel philosophy minor, please visit or contact the program director:

Dr. Peter Amato
Director of Programs in Philosophy
Department of English and Philosophy

MacAlister 5030

215-895-1353

peterama@drexel.edu (peterama@drexel.edu)

Co-op/Career Opportunities

No major prepares students for success in as wide a variety of careers as a philosophy major does. Because philosophical work helps students

develop superior reasoning, communication, and analytical skills, a philosophy major can be an ideal choice for students in pre-med or pre-law. It is also particularly valuable as a preparation for graduate study in philosophy, and in fields related to philosophy such as critical media studies, public policy, 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, and service organizations and agencies as well as many fields of graduate study and research.

In only its first five years, the Drexel philosophy program has graduated students into careers including the law, public policy, and academic philosophy taking them to The Law School of the University of Pennsylvania, The New School, and Northeastern University.

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*) Co-Director, Certificate Program in Medical Humanities. Associate Teaching Professor. Ethics, semiotics, existentialism

Peter Amato, PhD (*Fordham University*) Director, Philosophy. Associate Teaching Professor. Ethics, Marxism, Continental philosophy.

Jacques N. Catudal, PhD (*Temple University*). Associate Professor. Epistemology, aesthetics, philosophy of religion.

Nathan Hanna, PhD (*Syracuse University*). Assistant Professor. Ethics; philosophy of law; political philosophy.

Adam Knowles, PhD (*New School for Social Research*). Visiting Assistant Teaching Professor. Continental Philosophy, Phenomenology, Ancient Greek Philosophy, Ethics.

Carol Mele, PhD (*University of Pennsylvania*). Associate Teaching Professor. Ethics, medical ethics, critical reasoning.

Flavia Padovani, PhD (*University of Geneva*). Assistant Professor. History and philosophy of science, philosophy of science, epistemology, logic.

Marilyn Gaye Piety, PhD (*McGill University*). Associate Professor. History of philosophy, philosophy of religion, critical reasoning, Kierkegaard.

Andrew Smith, PhD (*SUNY, Stony Brook*) Associate Director, Philosophy. Assistant Professor. Social and political philosophy, ethics, American 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 Propositional Logic 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 Predicate Logic 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 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: Not repeatable 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: Not repeatable 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: Not repeatable 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 221 Epistemology 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 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 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 Communication Ethics 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 Computer Ethics 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 or Sophomore

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

Restrictions: Cannot enroll if classification is Freshman

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 Ethical Issues in Criminal Justice 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 Philosophy of the Environment 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 371 Philosophy of Social Sciences 3.0 Credits

Studies social scientific theory-construction and investigative methods from a philosophical standpoint, considering issues such as the distinction between explanation and interpretation, 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

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 395 Advanced Topics in Logic 3.0 Credits

Specialized topics, from among: self-reference paradoxes, set theory, axiomatization of arithmetic, computability, Church-Turing thesis, Gödel's theorem, minds and machines, Turing test, artificial intelligence, definitions of truth, models and satisfaction, analyticity, syntax/semantics, ontological commitment, intention/extension, reference justifying deduction, nominalism/realism, multi-valued logic, intuitionism, modal logic, doxastic logic, and logic of moral discourse.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 2 times for 6 credits

Restrictions: Cannot enroll if classification is Freshman or Sophomore

Prerequisites: PHIL 111 [Min Grade: D] and PHIL 207 [Min Grade: D]

PHIL 399 Independent Project in Philosophy 1.0-12.0 Credit

Provides directed reading and writing in philosophy.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 2 times for 6 credits

Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore

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 425 [WI] Seminar in Medieval Philosophy 3.0 Credits

Advanced study and discussion of the works of the leading philosophers and philosophical schools of the Medieval period. 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 Rationalism & Empiricism 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 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 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 465 [WI] Seminar in American Philosophy 3.0 Credits

Advanced study and discussion of works by leading American philosophers, including Peirce, James, Mead, Royce, C.I. Lewis, Quine, Davidson, Rorty and others. 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 475 Special Problems in Philosophy 3.0 Credits

Topic for each term to be announced. May be repeated for credit.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Restrictions: Cannot enroll if classification is Freshman or Sophomore

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 3 times for 9 credits

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 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 3 times for 9 credits

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 497 [WI] Senior Essay I: Research & Thesis 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]

Physics

Bachelor of Science Degree: 180.0 quarter credits

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.physics.drexel.edu>) conducts a broad array of outreach activities including the Kaczmarszik 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/physics/about/society-of-physics-students>) (SPS).

In addition to the physics major, the Department also offers a minor in physics as well as a minor in astrophysics.

Degree Requirements

Core Physics Requirements

PHYS 113	Contemporary Physics I	5.0
PHYS 114	Contemporary Physics II	5.0
PHYS 115	Contemporary Physics III	5.0
PHYS 105	Computational Physics I	3.0
PHYS 217	Thermodynamics	4.0
PHYS 311	Classical Mechanics I	4.0
PHYS 223 [WI]	Modern Physics Laboratory	3.0
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 credits from the following *

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	
MATH 322	Complex Variables	
MATH 323	Partial Differential Equations	
MATH 331	Abstract Algebra I	
MATH 489	Tensor Analysis	

Subject Courses: Complete 15 credits from the following: **

PHYS 231	Introductory Astrophysics	15.0
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PHYS 262	Introduction to Biophysics	
HNRS 301	Colloquium II (Special Relativity)	
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 463	Single Molecule Methods	
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 123	Calculus III	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

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

General Education

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
UNIV S101	The Drexel Experience	1.0
CIVC 101	Introduction to Civic Engagement	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

** Except for PHYS 480, 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.

Sample Plan of Study

	Credits
Term 1	
ENGL 101 Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
MATH 121 Calculus I	4.0
PHYS 113 Contemporary Physics I	5.0
PHYS 223 Modern Physics Laboratory [W]	3.0
UNIV S101 The Drexel Experience	1.0
Term Credits	16.0
Term 2	
CS 171 Computer Programming I	3.0
ENGL 102 Composition and Rhetoric II: The Craft of Persuasion	3.0
MATH 122 Calculus II	4.0
PHYS 114 Contemporary Physics II	5.0
Term Credits	15.0
Term 3	
ENGL 103 Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
MATH 123 Calculus III	4.0
PHYS 105 Computational Physics I	3.0
PHYS 115 Contemporary Physics III	5.0
CIVC 101 Introduction to Civic Engagement	1.0
Term Credits	16.0
Term 4	
CHEM 101 General Chemistry I	3.5
MATH 201 Linear Algebra	4.0
or 261 Linear Algebra	
MATH 200 Multivariate Calculus	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	
PHYS 326 Quantum Mechanics I	4.0
One of the following:	3.0-5.0
CHEM 103 General Chemistry III	
Any Biology (BIO) course	
Any ENGR course 200-level or higher	
Method course*	3.0
Free elective	3.0
Term Credits	13.0-15.0
Term 7	
PHYS 327 Quantum Mechanics II	4.0
PHYS 317 Statistical Mechanics	3.0
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 Advanced Laboratory [W]	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
Subject course	3.0
Liberal studies elective	3.0
Free elective	3.0
UNIV S201 Looking Forward: Academics and Careers (Recommended only. For students pursuing graduate study.)	1.0
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 Senior Research III [W]	3.0
Method course	3.0
Free electives	7.0
Term Credits	14.0
Total Credit: 180.0-182.0	

* See degree requirements.

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.

Minor in Physics

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 and the physics minor, students cannot minor in both.

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 credits from PHYS courses at the 300 level or above

Total Credits **26.0**

* PHYS 101, PHYS 102 and PHYS 201 will also satisfy the prerequisite requirements.

Physics Faculty

Alexey Aprelev, PhD (*St Petersburg State University*). Assistant Teaching Professor. Experimental biophysics.

S. M. Bose, PhD (*University of Maryland*). Professor. Theory of surfaces and interfaces, disordered systems, electron and X-ray spectroscopy of solids, high-temperature superconductivity.

Luis R. Cruz Cruz, PhD (*MIT*). Associate Professor. Correlation studies and density map analysis of the loss of spatial organization of neurons in the aged brain: computational studies of the folding of the Alzheimer amyloid beta protein using all-atom molecular dynamics; cellular automata models of the growth of plaques in Alzheimer's disease: fluid flow through porous media using computer lattice models.

N. John Dinardo, PhD (*University of Pennsylvania*) *Vice Provost for Academic Affairs*. Professor. Vibrational and electron dynamics at semiconductor surfaces and interfaces, metal-semiconductor interfaces,

polymer surfaces and interfaces, diamond-like carbon thin films, and protein and cell interactions with biomaterials surfaces.

Michelle Dolinski, PhD (*University of California, Berkeley*). Assistant 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.

Robert Gilmore, PhD (*Massachusetts Institute of Technology*). Professor. Applications of compact and non-compact Lie algebras for problems in nuclear, atomic, and molecular physics; nonlinear dynamics and chaos and the analysis of chaotic data.

David M. Goldberg, PhD (*Princeton University*) *Director of Undergraduate Studies*. Professor. Theoretical and computational cosmology, extragalactic astrophysics, parallel computing.

Goran Karapetrov, PhD (*Oregon State University*). Associate Professor. Experimental solid state physics, scanning probe microscopy, nanoscale catalysis, mesoscopic superconductivity.

Charles Lane, PhD (*California Institute of Technology*). Professor. Experimental tests of invariance principles and conservation laws, experimental search for magnetic monopoles and high-energy cosmic neutrinos, solar neutrinos and neutrino oscillations.

Teck-Kah Lim, PhD (*University of Adelaide*) *Associate Vice Provost for Graduate Studies*. Professor. Structures and dynamics of small nuclear and molecular systems, spin-polarized quantum systems, physics in two dimensions. Physics education.

Christina E. Love, PhD (*Temple University*). Assistant Teaching Professor. Experimental particle astrophysics; X-ray physics for security applications; and physics education and outreach.

Hairong Ma, PhD (*University of Illinois, Urbana-Champaign*). Assistant Professor. Protein folding, aggregation and mechanics; ultrafast laser spectroscopy; and microfluidics-integrated live-cell imaging of biomolecular dynamics.

Stephen L. W. McMillan, PhD (*Harvard University*). Professor. Stellar dynamics, large-scale computations of stellar systems, and high-performance special-purpose computers.

Naoko Kurahashi Neilson, PhD (*Stanford University*). Assistant Professor. Cosmology and particle astrophysics; IceCube Neutrino Observatory at the South Pole.

Gordon Richards, PhD (*University of Chicago*). Associate Professor. Quasars, active galactic nuclei, supermassive black holes, sky surveys, gravitational lensing, galaxy evolution.

Richard I Steinberg, PhD (*Yale University*). Professor. Experimental tests of invariance principles and conservation laws, experimental search for magnetic monopoles and high-energy cosmic neutrinos (MACRO experiment at Gran Sasso Laboratory, Italy), solar neutrinos and neutrino oscillations (CHOOZ project).

Somdev Tyagi, PhD (*Brigham Young University*). Professor. Nanobiophysics, Raman spectroscopy, magnetic materials.

Brigita Urbanc, PhD (*University of Ljubljana, Slovenia*). Associate Professor. Landau-Ginsburg theory of ferroelectric liquid crystals; cellular

automaton model of Alzheimer's senile plaque growth; protein folding and assembly relevant to Alzheimer's and Parkinson's diseases; discrete (discontinuous) molecular dynamics simulations and coarse-grain protein models; applications of automated neuron recognition and density map methods to quantify spatial correlations in aging brain.

Michel Vallières, PhD (*University of Pennsylvania*) *Department of Physics, Department Head*. Professor. Shell-model and mean field studies of nuclei on and off beta-stability, chaotic scattering, computational physics.

Michael Vogeley, PhD (*Harvard University*) *Director of Graduate Studies*. Professor. Cosmology; galaxy formation and evolution; statistical analysis of large data sets; active galactic nuclei.

Jian-Min Yuan, PhD (*University of Chicago*). Professor. Protein folding, signal transduction pathways, computational biophysics, nonlinear dynamics and chaos in atomic and molecular systems, protein folding.

Emeritus Faculty

Leonard D. Cohen, PhD (*University of Pennsylvania*). Professor Emeritus.

Leonard X. Finegold, PhD (*University of London*). Professor Emeritus. Biological physics and granular physics.

Richard D. Haracz, PhD (*Wayne State University*). Professor Emeritus.

Frederick House, PhD (*University of Wisconsin*). Professor Emeritus. Meteorology

Arthur P. Joblin, PhD (*Drexel University*). Professor Emeritus.

Donald C. Larson, PhD (*Harvard University*). Professor Emeritus.

Arthur E. Lord, PhD (*Columbia University*). Professor Emeritus.

James McCray, PhD (*California Institute of Technology*). Professor Emeritus.

T. S. Venkataraman, PhD (*Worcester Polytechnic Institute*). Professor Emeritus. Material engineering and 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

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: MATH 121 [Min Grade: D] and (APC 070 or APC2 070) or PHYS 100 [Min Grade: D]

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 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 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 Maple and simple FORTRAN/C/C++ 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]

Corequisite: MATH 123

PHYS 121 Physical Science for Design I 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 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 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 137 Issues in Science and Religion 3.0 Credits

This survey course examines the interconnections and differences of science and religion, including topics as Cosmology, Human Origins, Prayer and Consciousness. Fundamental to the exploration of these theories are the examination of the historical, philosophical, psychological and sociological implications of these topics for society.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 141 Atmospheric Science I - Climate and Global Change 3.0 Credits

The atmosphere and its structure and variations; greenhouse effect; ozone depletion; the influence of weather on man; air pollution; acid rain.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Corequisite: PHEV 142

PHYS 142 Atmospheric Science I Laboratory 1.0 Credit

Introduction to climate analysis and methods.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 143 Atmospheric Science II - Weather & Forecasting 3.0 Credits

The atmosphere and its properties; weather systems; severe weather; hurricanes; weather forecasting.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

Corequisite: PHEV 144

PHYS 144 Atmospheric Science II Laboratory 1.0 Credit

Introduction to meteorological analysis and forecasting methods.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

PHYS 151 Applied Physics 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 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]

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]

Corequisite: EXAM 081

PHYS 202 Fundamentals of Physics IV 4.0 Credits

Fourth of a four course sequence teaching fundamental physics to engineering and science majors. Topics include: statistical kinetic, equipartition of energy, entropy, ultra-low temperatures, thermal transport, interaction of charged particles and light with biological tissue, fiber optics, IR, Raman, spectroscopy, fluidics, and microfluidics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: PHYS 201 [Min Grade: D]

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 222 Modern Physics 4.0 Credits

Covers special relativity and the electron, black-body radiation, quantum theory of radiation, Bohr theory, wave particle duality, Schrodinger equation, and nuclear phenomena.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 200 [Min Grade: D]

PHYS 223 [WI] Modern Physics Laboratory 3.0 Credits

Requires students to perform experiments in modern physics, including the Millikan oil-drop experiment, the photoelectric effect measurement, spectrometer experiments, atomic spectra observations, the Frank-Hertz experiment, the decay rate of radon, and a beta particle range experiment. 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: PHYS 113 [Min Grade: D] (Can be taken Concurrently)

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 261 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 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: CS 171 [Min Grade: D], PHYS 105 [Min Grade: D]

PHYS 311 Classical Mechanics I 4.0 Credits

Covers motion in one, two, and three dimensions, conservation laws, and damped harmonic oscillator, forced harmonic oscillator, and central force motion.

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. 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: PHYS 115 [Min Grade: D] (Can be taken Concurrently)

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 Schrodinger 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 399 Independent Study in Physics 12.0 Credits

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

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 15 credits

Restrictions: Cannot enroll if classification is Freshman

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 nucleosynthesis, 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 451 Quantum Structure of Materials 4.0 Credits

Introduces modern physics, including wave-particle duality; quantum mechanics of electrons located in one-dimensional potentials; introduction to solid-state physics; electronics in periodic potentials and energy band structure; numerical computations; metals, semiconductors, and insulators; electronic devices; quantum devices; and laboratory experiments in scanning tunneling microscopy and atomic force microscopy.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: PHYS 201 [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 305 [Min Grade: D] and PHYS 317 [Min Grade: D]

Corequisite: PHYS 321

PHYS 463 Single Molecule Methods 3.0 Credits

Covers the principles, operations and applications of the most commonly used single molecule methods in biophysics, including scanning probe microscopy and spectroscopy, optical trapping and fluorescence resonance energy transfer techniques.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: PHYS 217 [Min Grade: D] and PHYS 322 [Min Grade: D]

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 480 Special Topics 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

PHYS 485 Research 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]

Political Science

Bachelor of Arts Degree: 182.0 quarter credits

About the Program

The political science program in the Department of History & Politics (<http://www.drexel.edu/histpol>) 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.

In addition, the department also offers minors in American Studies , European Studies, History, Science, Technology and Human Affairs (<http://catalog.drexel.edu/undergraduate/collegeofartsandsciences/sciencetechhumanaffairsminor>), Politics, and World History and Politics .

Degree Requirements

General Education Requirements

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
UNIV H101	The Drexel Experience	1.0
UNIV H201	Looking Forward: Academics and Careers	1.0
CIVC 101	Introduction to Civic Engagement	1.0
Two Math courses		6.0-8.0
Two Science courses*		6.0-8.0

Foundation Requirements

Two Studies in Diversity electives		6.0
Three Consecutive Foreign Language courses (must complete level 201)**		12.0
Four Humanities/Fine Arts electives		12.0
Four Social Science electives		12.0

Two International Studies electives		6.0
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Core Political Science Requirements

PSCI 110	American Government I	4.0
PSCI 120	History of Political Thought	4.0
PSCI 140	Introduction to Comparative Political Analysis	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 200	The Public Policy Process	
PSCI 211	American Government II	
PSCI 220	Constitutional Law I	
PSCI 223	Comparative Political Thought	
PSCI 229	Theories of Justice	
PSCI 240	Comparative Government	
PSCI 250	American Foreign Policy	
PSCI 251	International Organization: Theory and Research	
PSCI 260 [WI]	Social Movements in Comparative Perspective	
PSCI 270	Problems of Individual Liberty and Government Authority	
PSCI 330	Public Opinion & Propaganda	
PSCI 363	Constitutional Law II	

Political Science Electives *** 32.0

Free Electives 33.0

Total Credits **181.0-185.0**

* 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.

Sample Plan of Study

Term 1		Credits
UNIV H101	The Drexel Experience	1.0
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
PSCI 110	American Government I	4.0
PSCI 150	International Politics	4.0
Foreign Language course		4.0
Term Credits		16.0
Term 2		Credits
CIVC 101	Introduction to Civic Engagement	1.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	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 Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
PSCI 140 Introduction to Comparative Political Analysis	4.0
Foreign Language course	4.0
Diversity Studies elective	3.0
Social Science elective	3.0
Term Credits	17.0
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: 181.0	

Accelerated BA in Political Science and MS in Science, Technology & Society

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 and an MS degree in Science, Technology & Society (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 History and 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

Recommended Plan of Study

Students should work closely with faculty advisors in the Science, Technology & Society program to schedule an individualized plan of study for their accelerated degree completion.

The following is a sample plan of study for a student starting in junior year, with 108.0 credit hours completed:

Dual Bachelor's Degree & MSTS Degree

222.0 minimum credits

Term 7	Credits
Undergraduate Courses	13.0
Two Science, Technology & Society Courses*	6.0
Term Credits	19.0
Term 8	
Undergraduate Courses	13.0
Two Science, Technology & Society Courses	6.0
Term Credits	19.0
Term 9	
Undergraduate Courses	10.0
Two Science, Technology & Society Courses	6.0
One Graduate Elective**	3.0
Term Credits	19.0
Term 10	
Undergraduate Courses	10.0
Two Science, Technology & Society Courses	6.0
HIST 696 Seminar in Science, Technology, and Society	3.0
Term Credits	19.0
Term 11	
Undergraduate Courses	13.0
One Graduate Elective**	3.0
HIST 697 Practicum: Science and Technology in Action	3.0
Term Credits	19.0
Term 12	
One Graduate Elective	10.0
Undergraduate Courses**	3.0
HIST 698 Master's Thesis	6.0
Term Credits	19.0
Total Credit: 114.0	

* HIST 501 recommended as the first course.

** Graduate electives may be taken as graduate-level courses in History-Politics or from other departments/Colleges within the University

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://www.drexel.edu/sts>), 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.

History + Politics Faculty

Lloyd Ackert, PhD (*Johns Hopkins University*). Associate Teaching Professor. Russian science, history of biology, ecology.

Scott Barclay, PhD (*Northwestern University*) *Department Head, History + Politics*. Professor. Judicial systems, civil rights, public policy and administration.

Zoltan Buzas, PhD (*Ohio State University*). Post-Doctoral Fellow. International relations theory, international security, race and politics, diplomatic history.

George Ciccariello-Maher, PhD (*University of California, Berkeley*). Assistant Professor. Colonialism, social movements, political theory.

Rose Corrigan, PhD (*Rutgers University*) *Director of Women's Studies Program*. Associate Professor. Women, public law, American politics and policy.

Richardson Dilworth, PhD (*Johns Hopkins University*) *Director, Center for Public Policy*. Associate Professor. American political development, urban politics, public policy.

Erin R. Graham, PhD (*Ohio State University*). Assistant Professor. International institutions, international relations theory, global environmental politics.

Amelia Hoover Green, PhD (*Yale University*). Assistant Professor. Dynamics of conflict-related violence; intra-armed group politics and socialization; statistics in human rights.

Christian Hunold, PhD (*University of Pittsburgh*). Associate Professor. Environmental policy and comparative politics.

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, social theory.

Scott G. Knowles, PhD (*Johns Hopkins University*) *Associate Dean and Director, Center for Interdisciplinary Inquiry, Pennoni Honors College*. Associate Professor. Urban history, history of technology, modern history.

Jonson Miller, PhD (*Virginia Tech*). Associate Teaching Professor. Science and technology, American history, military history.

Julie Mostov, PhD (*New York University*) *Associate Vice Provost for International Programs*. Professor. Modern political thought, democratic theory, nationalism, gender studies, South Eastern Europe and the Balkans.

Joel E. Oestreich, PhD (*Brown University*) *Director of International Area Studies*. Associate Professor. International organizations, international finance, development, and human rights.

William L. Rosenberg, PhD (*Temple University*). Professor. Behavioral politics, public opinion, and political communication.

Tiago Saraiva, PhD (*Universidad Autónoma de Madrid*). Assistant Professor. Science and fascism, environment in contemporary history, global circulation of science, industrialized organisms and food, model organisms and genetics research.

Jonathan Seitz, PhD (*University of Wisconsin*) *Director of Undergraduate Studies for History + Politics*. Associate Teaching Professor. History of religion, science, medicine, witchcraft, early modern Europe, Italy.

Amy Slaton, PhD (*University of Pennsylvania*). Professor. History of science and technology; 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*). Associate Professor. Modern Latin American history.

Robert Zaller, PhD (*Washington University*). Professor. English history and early modern European history.

Emeritus Faculty

Eric Dorn Brose, PhD (*Ohio State University*). Professor Emeritus. German and European history.

Richard L. Rosen, PhD (*Case Western Reserve University*). Associate Professor Emeritus. History of science, appropriate technology, and world history.

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 I 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 Introduction to Comparative Political Analysis 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 200 The Public Policy Process 4.0 Credits

Provides students with a general understanding of policy formulation and implementation, primarily at the national level. In addition, students gain more specialized knowledge about a policy field of their choosing. Topics covered include theories of the policy process, policy formulation and process, policy implementation, and specific policy areas.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSCI 211 American Government II 4.0 Credits

Provides a structural analysis of selected social, economic, and political institutions at various levels of government in the American political system.

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 we consider 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

Prerequisites: PSCI 131 [Min Grade: D]

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

Prerequisites: PSCI 131 [Min Grade: D]

PSCI 240 Comparative Government 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 251 International Organization: Theory and Research 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 Economics 4.0 Credits

Analyzes the contradiction between the political-military world and the newly emerging trading world, and its impact on future global political systems.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

PSCI 260 [WI] 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: How have international organizations facilitated social movement mobilization? Why and how have social attitudes and state laws changed differently across different states? 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 270 Problems of Individual Liberty and Government Authority 4.0 Credits

Examines the relationship between personal freedom and a just society from a variety of perspectives, all of which are designed to serve as an introduction to history and politics.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: PSCI 120 [Min Grade: D]

PSCI 272 Contemporary Political Issues 3.0 Credits

Examines a current policy issue in its political context. See departmental brochure for subject scheduled in a particular term. May be repeated for credit.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Restrictions: Cannot enroll if classification is Freshman

PSCI 280 Special Topics in Political Science 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 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 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 327 Democratic Theory 4.0 Credits

Examines the works of various classical and contemporary thinkers on the nature, justification, and practice of democracy. Emphasizes matters of liberty, equality, participation, and social choice.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

PSCI 329 Theories of Justice 3.0 Credits

Examines the nature and realization of justice in modern societies, with special attention to contemporary questions of civil rights.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

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 331 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 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 3.0 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: Can be repeated multiple times for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: PSCI 150 [Min Grade: D] or PSCI 344 [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 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 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 365 Politics, Law, & Justice 4.0 Credits

Examines justice as politically determined, including the personnel, policies, and practices of units of the legal system, especially civil, criminal, and juvenile courts in urban areas.

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 1st part of the course describes and analyzes the US food system, with a focus on regulatory policies and interest group politics. The 2nd 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 of urbanization.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

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 380 Special Topics in Political Science 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 480 Special Topics in Political Science 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

PSCI 492 Political Science Honors Thesis I 3.0 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.

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 211 [Min Grade: D] and PSCI 220 [Min Grade: D] and PSCI 230 [Min Grade: D] and PSCI 240 [Min Grade: D] and PSCI 250 [Min Grade: D] and PSCI 270 [Min Grade: D]

PSCI 493 Political Science Honors Thesis II 3.0 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 499 Independent Study 0.5-12.0 Credits

Provides independent study on a topic approved by the department.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Minor in Politics

Required Courses

Select three of the following:	12.0
PSCI 100 Introduction to Political Science	
PSCI 110 American Government I	
PSCI 120 History of Political Thought	
PSCI 130 Research Design for Political Science	
PSCI 140 Introduction to Comparative Political Analysis	
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

Psychology

Bachelor of Science Degree: 182.0 quarter credits

About the Program

Psychology seeks the answers to a broad variety of questions regarding the behavior, thoughts, and emotions of individuals. These questions range from the biochemical basis of memory and the effects of stress on health to understanding the causes of emotional problems or such experiences as falling in love. These questions are studied by using scientific research techniques both in the laboratory and the "real" world. The answers are applied in fields such as business, the health sciences, law, education, counseling, and the design of useful and usable technologies.

One strength of the psychology program at Drexel is its emphasis on psychological statistics and research methodology. Psychology majors are well trained in research data analysis and find employment opportunities in research and corporate settings more readily. One other opportunity available to Drexel psychology undergraduates is the co-operative education/internship programs, through which students mix periods of full-time, career-related employment with their academic studies. This allows students to have "hands on" experience in a variety of clinical settings throughout the Philadelphia metropolitan region, and makes them more competitive for employment after graduation.

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://psychology.drexel.edu>) homepage.

Additional Information

To schedule an appointment with a Psychology faculty advisor, students should contact the Psychology department's academic coordinator:

Tara McNair
Academic Coordinator
Psychology Department
3141 Chestnut Street
215-895-0487
tym22@drexel.edu

Degree Requirements

College Requirements

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
CS 161	Introduction to Computing	3.0

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	
PSCI 100	Introduction to Political Science	4.0
UNIV H101	The Drexel Experience	3.0
Economics elective		4.0
Fine Arts elective		3.0
History electives		6.0
Philosophy elective		3.0
Two English (ENGL) courses, 200-level or above		6.0
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 & PHYS 104	General Physics I and General Physics II	

Other Courses

Free electives 53.0

Departmental Requirements**General Psychology Requirements**

PSY 111	Pre-Professional General Psychology I *	3.0
PSY 112	Pre-Professional General Psychology II *	3.0

Sociology/Anthropology Requirements

Sociology (SOC) course	3.0
Anthropology (ANTH) course	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 325	Psychology of Learning	3.0
PSY 240 [WI]	Abnormal Psychology	3.0
PSY 280	Psychological Research I	3.0
PSY 264	Computer-Assisted Data Analysis I	3.0
PSY 265	Computer-Assisted Data Analysis II	3.0
PSY 290	History and Systems of Psychology	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

Select four of the following: 12.0

PSY 210	Evolutionary Psychology	
PSY 213	Sensation and Perception	
PSY 225	Child Psychopathology	
PSY 245 [WI]	Sports Psychology	
PSY 250 [WI]	Industrial Psychology	
PSY 252	Death and Dying	
PSY 310	Drugs & Human Behavior	
PSY 322	Advanced Developmental Psychology	
PSY 332	Human Factors and Cognitive Engineering	
PSY 337	Human-Computer Interaction	
PSY 342	Counseling Psychology	
PSY 350	Advanced Social Psychology	
PSY 355	Health Psychology	
PSY 356	Women's Health Psychology	
PSY 410	Neuropsychology	
PSY 440	Advanced Personality Seminar	
PSY 442	Theories & Practices in Clinical Psychology	

Senior Seminar Sequence **

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 182.0

* 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 elect the research seminar sequence are required to take four additional advanced psychology electives instead.

Sample Plan of Study

Term 1		Credits
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	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	2.0
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		16.0
Term 2		
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
PSY 112	Pre-Professional General Psychology II	3.0
MATH 102 or 122	Introduction to Analysis II Calculus II	4.0
UNIV H101	The Drexel Experience	2.0
Select one of the following:		4.0
BIO 109	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		19.0
Term 3		
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
PSY 240 [WI]	Abnormal Psychology	3.0
Select one of the following:		3.0
PSY 120	Developmental Psychology	
PSY 150	Introduction to Social Psychology	
PSY 140	Approaches to Personality	
Sociology/Anthropology elective (SOC or ANTH)		3.0
Fine Arts elective		3.0
Term Credits		15.0
Term 4		
PSCI 100	Introduction to Political Science	4.0
PSY 264	Computer-Assisted Data Analysis I	3.0
PSY 290	History and Systems of Psychology	3.0
Sociology/Anthropology elective (SOC or ANTH)		3.0
English (ENGL) course, 200-level or above		3.0
Term Credits		16.0
Term 5		
COM 150 or 230	Mass Media and Society Techniques of Speaking	3.0
PSY 265	Computer-Assisted Data Analysis II	3.0

PSY 330	Cognitive Psychology	3.0
PSY 212	Physiological Psychology	3.0
English (ENGL) course, 200-level or above		3.0
Philosophy (PHIL) elective		3.0
Term Credits		18.0
Term 6		
PSY 212	Physiological Psychology	3.0
PSY 280	Psychological Research I	3.0
PSY 360 [WI]	Experimental Psychology	3.0
UNIV H101	The Drexel Experience	1.0
Psychology elective		3.0
Economics (ECON) elective		4.0
Term Credits		17.0
Term 7		
PSY 325	Psychology of Learning	3.0
PSY 380	Psychological Testing and Assessment	3.0
History elective		3.0
Free electives		9.0
Term Credits		18.0
Term 8		
Advanced Psychology course*		3.0
History elective		3.0
Free electives		9.0
Term Credits		15.0
Term 9		
Advanced Psychology course*		3.0
Free electives		9.0
Term Credits		12.0
Term 10		
PSY 490 [WI]	Psychology Senior Thesis I (or adv. PSY elective (If electives are chosen, 12.0 credits in total are required.))	4.0
Advanced Psychology elective		3.0
Free electives		6.0
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 (or adv. PSY elective (If electives are chosen, 12.0 credits in total are required.))	4.0
Free electives		9.0
Term Credits		13.0
Total Credit: 185.0		

* See degree requirements.

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.

Minor in Psychology

The minor in psychology is intended to meet the needs of students who recognize that an understanding and analysis of individual psychological processes is an important component of their education. 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 a Psychology Department faculty member 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)
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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 322	Advanced Developmental Psychology	
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 350	Advanced Social Psychology	
PSY 360 [WI]	Experimental Psychology	

PSY 380	Psychological Testing and Assessment
PSY 410	Neuropsychology
PSY 442	Theories & Practices in Clinical Psychology
PSY 480	Special Topics in Psychology
Total Credits	24.0

Psychology Faculty

Meg Butryn, PhD (*Drexel University*). Assistant Research Professor. Treatment and prevention of obesity and eating disorders, behavioral treatment, acceptance and commitment therapy.

Dorothy Charbonnier, PhD (*SUNY Stony Brook*). Assistant Teaching Professor. The nature of the creative process and writing.

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*). Assistant 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*. Associate Professor. Psychopathy, forensic mental health assessment, drug policy; offender diversion.

Evan M. Forman, PhD (*University of Rochester*) *Director of Graduate Studies*. Associate 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.

Jennifer Gallo, PhD (*Drexel University*). Associate Teaching Professor. Geropsychology, neuropsychology, and assessment of dementia.

Pamela Geller, PhD (*Kent State University*). 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*). Associate Teaching Professor. Clinical psychopathology; neuropsychological evaluation and intervention with the elderly.

Naomi Goldstein, PhD (*University of Massachusetts*) *Co-Director of the JD-PhD Program*. Associate 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, violence risk communication, juvenile and adult criminality, violence risk assessment, forensic psychological assessment, treatment of mentally disordered offenders, academic-sports mentoring.

James D. Herbert, PhD (*University of North Carolina*) *Dean, Graduate College; Executive Vice Provost*. Professor. Assessment and treatment of anxiety disorders; acceptance and mindfulness-based psychotherapies;

the role of empiricism in clinical psychology; evidence-based practice in behavioral health.

Marlin Killen, PhD (*Trident University International*) *Faculty Coordinator of ePsychology*. Associate Teaching Professor.

Jacqueline D. Kloss, PhD (*Binghamton University*). Associate Professor. Health psychology; clinical psychology; written emotional expression and health; women and sleep; college students and sleep and cognitive-behavioral approaches to insomnia.

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.

Nancy Raitano Lee, PhD (*University of Denver*). Assistant Professor. Characterizing the Down syndrome neuroanatomic phenotype; Neuropsychological trajectories associated with good and poor cognitive and behavioral outcome in Down syndrome and other genetic disorders.

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.

Dan Mirman, PhD (*Carnegie Mellon University*). Assistant Professor. Recognition, comprehension, and production of spoken words; organization and processing of semantic knowledge; computational models of brain and behavior; statistical methods for analysis of time course data

Arthur Nezu, PhD (*State University of New York at Stony Brook*). Distinguished Professor. 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. 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*). Assistant Teaching Professor. The application of advanced neuroimaging to the study of human brain function and anatomy.

Ludo Scheffer, PhD (*University of Pennsylvania*) *Director of Undergraduate Studies*. Teaching Professor. Metacognition; early literacy and language acquisition; program evaluation and measurement to improve student achievement and teacher performance.

Maria Schultheis, PhD (*Drexel University*) *Director of Clinical Training*. Associate 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*. Associate Teaching Professor. Adult psychopathology; evidence-based clinical practice; competency-based training; competency-based clinical supervision.

Chris Sims, PhD (*Rensselaer Polytechnic Institute*). Assistant Professor. Learning and decision-making under uncertainty; visual memory and perceptual expertise; sensorimotor control and motor learning; computational models of cognition.

Julia Sluzenski, PhD (*Temple University*). Assistant Teaching Professor. Spatial and episodic memory, memory loss across the lifespan, developmental psychology.

Mary Spiers, PhD (*University of Alabama at Birmingham*) Director, *Psychology Master's Program*. Associate Professor. Clinical neuropsychology and medical psychology; memory and practical applications for memory disorders in the elderly; cognitive health of women.

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*). Assistant Professor. Neuroimaging data analysis and quantitative research methods including hierarchical models, multivariate analysis, generalized linear models, data mining, and Bayesian modeling; Statistical modeling and methodological development for social, behavioral, and biomedical related problems.

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.

Interdepartmental Faculty

Donald Bersoff, JD, PhD (*Yale University, New York University*). Professor Emeritus. Mental health law.

Emeritus Faculty

Thomas T. 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.

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." Requires field trip. 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 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 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 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 322 Advanced Developmental Psychology 3.0 Credits

Provides in-depth exploration of child and adolescent physical, cognitive/intellectual, and psychosocial development. Students have the opportunity to observe children and their caregivers through videotaped vignettes created to bring developmental principles to life.

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 120 [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]

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 adolescence 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 350 Advanced Social Psychology 3.0 Credits

Provides in-depth exploration of topics in the social influence process, including current research in social cognition, attitude change, and group dynamics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: PSY 150 [Min Grade: D]

PSY 352 Environmental Psychology 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 eating 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 364 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 365 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 364 [Min Grade: D] and (PSY 112 [Min Grade: D] or PSY 101 [Min Grade: D])

PSY 368 Critical Psychology 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 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 460 Advanced Experimental Psychology: Laboratory Applications and Techniques 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 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 480 Directed Studies in Psychology 0.5-12.0 Credits

Provides supervised reading and studies in special fields of contemporary psychology. See department brochure for topics and terms offered.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

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 499 Independent Study 1.0-3.0 Credit

This Independent Study provides the opportunity for an undergraduate student to engage in the study of a particular area of psychology that is not covered in-depth by an existing course. Typically, this independent study would focus on a narrower topic (e.g., autism, school violence, bullying, psychology of sleep, etc.) than a given course (e.g., abnormal psychology). Moreover, the nature of the study would be more in-depth than can be accomplished in a traditional course.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Minor in Science, Technology and Human Affairs

This minor affords students the opportunity to obtain in-depth exposure to the political and social issues related to modern science and technology. The program provides knowledge and skills useful in many areas of professional employment or as preparation for graduate and professional study.

Required Courses

HIST 280	History of Science: Ancient to Medieval	3.0
HIST 281	History of Science: Enlightenment to Modernity	3.0
Select three History or Politics courses in science or technology		9.0

Some examples of HIST or PSCI courses in this category include:

HIST 220	History of American Business
HIST 222	History of Work & Workers in America
HIST 282	History of Science: Medieval to Enlightenment
HIST 285	Technology in Historical Perspective
HIST 286	Exploration in Technology and Gender
HIST 292	Technology in American Life
PSCI 331	Environmental Politics
PSCI 370	Topics in Public Policy
PSCI 372	City in United States Political Development

Select three of the following: 9.0

ANTH 210 [WI]	Worldview: Science, Religion and Magic
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ANTH 240	Urban Anthropology
ANTH 355	Anthropology of Cyberspace
ENGL 300 [WI]	Literature & Science
ENGL 302	Environmental Literature
PHIL 311	Computer Ethics
PHIL 351	Philosophy of Technology
PHIL 361	Philosophy of Science
SOC 110	Sociology of the Future
SOC 215	Sociology of Work

Total Credits 24.0

Sociology

Bachelor of Arts Degree: 182.0 quarter credits

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 through which the Sociology Program and Drexel University as a whole seeks to become practically engaged with the wider community while promoting social justice.

For more information about the sociology major, visit the Sociology (<http://www.drexel.edu/culturecomm/academics/undergraduate/sociology>) web page.

Degree Requirements

General Requirements

ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0
UNIV H101	The Drexel Experience	1.0

UNIV H201	Looking Forward: Academics and Careers	1.0
CIVC 101	Introduction to Civic Engagement	1.0
Four Humanities/Fine Arts Courses		12.0
Two Mathematics Courses		6.0-8.0
Two Science Courses		6.0-8.0
Two Consecutive Foreign Language Courses *		8.0
Social and Behavioral Sciences		
COM 150	Mass Media and Society	3.0
SOC 101	Introduction to Sociology	3.0
Two Additional Social and Behavioral Sciences Courses		6.0
International Studies		
Two International Studies Courses		6.0
Studies in Diversity		
ANTH 101	Introduction to Cultural Diversity	3.0
One Additional Studies in Diversity Course		3.0
Sociology Core Requirements		
Required Major Seminar		
SOC 395	Seminar in Sociology (3-credit course, taken 4 or 5 times)	12.0-15.0
Theory Sequence		
COM 210	Theory and Models of Communication	3.0
SOC 260 [WI]	Classical Social Theory	3.0
ANTH 410	Cultural Theory	3.0
SOC 460 [WI]	Contemporary Social Theory	3.0
Methods Sequence		
ANTH 370	Ethnographic Methods	3.0
COM 220	Qualitative Research Methods	3.0
SOC 250	Research Methods I	3.0
SOC 364	Computer-Assisted Data Analysis	3.0
Core Courses		
Select five of the following:		15.0
SOC 210	Race and Ethnic Relations	
SOC 230	Women & Men in a Changing Society	
SOC 220	Wealth and Power	
SOC 240	Urban Sociology	
SOC 320	Sociology of Deviant Behavior	
SOC 330	Developing Nations and the International Division of Labor	
Other Program Requirements		
Select ten of the following:		30.0
ANTH 110	Human Past: Anthropology and Prehistoric Archeology	
ANTH 120	Biblical Archaeology: The Archaeology of Israel and Jordan	
ANTH 212 [WI]	Topics in World Ethnography	
ANTH 220	Aging In Cross-Cultural Perspective	
ANTH 310	Societies In Transition: The Impact of Modernization and the Third World	
ANTH 312	Approaches to Intercultural Behavior	
ANTH 380	Special Topics in Anthropology	
COM 230	Techniques of Speaking	
COM 270 [WI]	Business Communication	

COM 280	Public Relations Principles and Theory	
SOC 110	Sociology of the Future	
SOC 115	Social Problems	
SOC 120	Sociology of the Family	
SOC 125	Sociology of Aging	
SOC 215	Sociology of Work	
SOC 235	Sociology of Health	
SOC 230	Women & Men in a Changing Society	
SOC 240	Urban Sociology	
SOC 270	Theory of Applied and Community Sociology	
SOC 310	Topics in Political Sociology	
SOC 311	Topics in Sociology of Religion	
SOC 312	Topics in Sociology of Science and Technology	
SOC 315	HIV/AIDS and Africa	
SOC 325	Introduction to Urban and Environmental Planning	
SOC 335	Sociology of Education I	
SOC 341	Environmental Movements in America	
SOC 344	Social Movements	
SOC 345	Sociology of the Environment	
SOC 349	Sociology of Disasters	
SOC 350	Research Methods II	
SOC 370	Practicum in Applied and Community Sociology	
SOC 365	Computer-Assisted Data Analysis II	
SOC 380	Special Topics in Sociology	
SOC 470	Social Change & Planning	
SOC 490	Sociology Research Seminar I	
SOC 491	Sociology Research Seminar II	
SOC 492	Sociology Research Seminar III	
PSY 150	Introduction to Social Psychology	
PSY 252	Death and Dying	
PSY 350	Advanced Social Psychology	
UNIV 380	Special Topics-University Wide	
Free Electives		33.0
Total Credits		182.0-189.0

* 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.

Sample Plan of Study

Term 1		Credits
ENGL 101	Composition and Rhetoric I: Inquiry and Exploratory Research	3.0
SOC 101	Introduction to Sociology	3.0
SOC 395	Seminar in Sociology	3.0
UNIV H101	The Drexel Experience	1.0
Mathematics Course		3.0-4.0
Foreign Language Course		4.0
Term Credits		17.0-18.0
Term 2		Credits
COM 150	Mass Media and Society	3.0

ENGL 102	Composition and Rhetoric II: The Craft of Persuasion	3.0
CIVC 101	Introduction to Civic Engagement	1.0
	Foreign Language Course	4.0
	Mathematics Course	3.0-4.0

Term Credits **14.0-15.0**

Term 3

ANTH 101	Introduction to Cultural Diversity	3.0
ENGL 103	Composition and Rhetoric III: Thematic Analysis Across Genres	3.0

SOC 260 [WI]	Classical Social Theory	3.0
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	Science Elective*	3.0-4.0
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	Foreign Language Course	4.0
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Term Credits **16.0-17.0**

Term 4

COM 220	Qualitative Research Methods	3.0
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SOC 210	Race and Ethnic Relations	3.0
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SOC 250	Research Methods I	3.0
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SOC 395	Seminar in Sociology	3.0
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	Foreign Language Course	4.0
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Term Credits **16.0**

Term 5

ANTH 370	Ethnographic Methods	3.0
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COM 210	Theory and Models of Communication	3.0
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SOC 240	Urban Sociology	3.0
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	Free Elective	3.0
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	Science Elective*	3.0-4.0
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Term Credits **15.0-16.0**

Term 6

SOC 364	Computer-Assisted Data Analysis	3.0
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	Diversity Studies Elective	3.0
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	Social and Behavioral Sciences Elective	3.0
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	Other Program Requirement*	3.0
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	Free Elective	3.0
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Term Credits **15.0**

Term 7

SOC 220	Wealth and Power	3.0
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SOC 230	Women & Men in a Changing Society	3.0
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	Social and Behavioral Sciences Elective	3.0
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	Other Program Requirement*	3.0
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	Free Elective	3.0
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Term Credits **15.0**

Term 8

SOC 320	Sociology of Deviant Behavior	3.0
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SOC 330	Developing Nations and the International Division of Labor	3.0
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SOC 395	Seminar in Sociology	3.0
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	Other Program Requirement*	3.0
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UNIV H201	Looking Forward: Academics and Careers	1.0
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	Free Elective	3.0
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Term Credits **16.0**

Term 9

	Humanities/Fine Arts Elective	3.0
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	Free Elective	3.0
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	International Studies Elective	3.0
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	Other Program Requirements*	6.0
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Term Credits **15.0**

Term 10

ANTH 410	Cultural Theory	3.0
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SOC 395	Seminar in Sociology	3.0
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	Other Program Requirements*	6.0
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	Humanities/Fine Arts Elective	3.0
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Term Credits **15.0**

Term 11

SOC 460 [WI]	Contemporary Social Theory	3.0
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	Other Program Requirements*	6.0
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	International Studies Elective	3.0
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	Free Elective	4.0
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Term Credits **16.0**

Term 12

	Other Program Requirement*	3.0
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	Sociology Core Course*	3.0
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	Humanities/Fine Arts Electives	6.0
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Term Credits **12.0**

Total Credit: 182.0-186.0

* See degree requirements.

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:

- Research Coordinator, West Philadelphia Community Center
- Counselor, Camden Youth Program
- Research Analyst, Philadelphia Stock Exchange
- Case Investigator, Howard County Police Department
- Assistant Copy Editor, Philadelphia Newspapers, Inc.

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

Minor in Sociology

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.

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 250	Research Methods I	3.0
SOC 260 [WI]	Classical Social Theory	3.0
SOC 460 [WI]	Contemporary Social Theory	3.0
Select five of the following:		15.0
ANTH 220	Aging In Cross-Cultural Perspective	
ANTH 310	Societies In Transition: The Impact of Modernization and the Third World	
CJ 362	Gender, Crime and Justice	
SOC 110	Sociology of the Future	
SOC 115	Social Problems	
SOC 120	Sociology of the Family	
SOC 125	Sociology of Aging	
SOC 205	Criminology & Criminal Justice	
SOC 210	Race and Ethnic Relations	
SOC 215	Sociology of Work	
SOC 220	Wealth and Power	
SOC 225	Sociology of Technology & Aging	
SOC 230	Women & Men in a Changing Society	
SOC 235	Sociology of Health	
SOC 310	Topics in Political Sociology	
SOC 320	Sociology of Deviant Behavior	
SOC 330	Developing Nations and the International Division of Labor	
SOC 335	Sociology of Education I	
SOC 336	Sociology of Education II	
SOC 340	Globalization	
SOC 350	Research Methods II	
SOC 470	Social Change & Planning	

Total Credits **24.0**

Culture and Communication Faculty

Ronald Bishop, III, PhD (*Temple University*). 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*) *Coordinator of the Publication Management Program*. Instructor. Publishing, electronic publishing, publishing and communications, publishing and mass-media.

Robert J. Brulle, PhD (*George Washington University*). Professor. Environmental policy and politics, critical theory, marine risk, social movements, environmental sociology.

Karen Cristiano, PhD (*Temple University*). Associate Teaching Professor. Journalism, medical writing, feature writing, copy editing, mass media and society.

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

Daniela De Pau, PhD (*University of Illinois at Urbana-Champaign*). Assistant Teaching Professor. Italian cinema, relationship between literature, cinema and other arts, traveling literature, women writers, the tradition of the Comic and the tradition of the Fantastic, autobiography, politics of immigration, cultural identity in contemporary Italy.

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*). 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.

Paul Evangelista, PhD (*Temple University*). Assistant Teaching Professor. Public relations, communication theory, new technologies in communication (classroom and online); business communication.

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

Alexander Friedlander, PhD (*Carnegie Mellon University*) *Associate Dean, College of Arts and Sciences*. Associate Professor. Rhetorical theory and practice, document design, writing and technology.

Anthony Glascock, PhD (*University of Pittsburgh*) *Coordinator of the Anthropology Program*. Professor. Aging and health, definitions of functionality and impairment, technology and aging, social organization, Ireland, East Africa.

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

Julia Hall, PhD (*University of Pennsylvania*). Professor. Criminal justice and juvenile justice reform, including community based alternatives to incarceration, correctional education and programming, reentry and reintegration, restorative justice, and issues relating to special needs offenders, including the el

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

Barbara Hornum, PhD (*Bryn Mawr College*) *Director of Center for Academic Excellence (DCAE)*. Associate Professor. Comparative gerontology, planned communities, continuing care communities, retirement, faculty development.

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

Frank Kelley, PhD (*Temple University*). Associate Teaching Professor. Corporate university systems online, power structure of media enterprises, public relations, event planning.

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.

David Kutzik, PhD (*Temple University*) Coordinator of the *Sociology Program*. Professor. Sociology and philosophy of science; applied gerontological research; political economy of health care; microprocessor-based assistive technologies to improve case management and increase independent living among frail populations.

Brent Luvaas, PhD (*UCLA*). Assistant Professor. DIY and independent media production; transnational consumer culture; popular music; new media and mediated subjectivities; youth culture in the US and Indonesia.

Joanna Lyskowicz, MA (*UAM Poznan, Poland*). Instructor. Comparative linguistics, translation, business Spanish, medical Spanish, modern Spanish literature, XXth cent. Spanish poetry, magical realism in Latin American literature.

Diamantino Machado, PhD (*Temple University*). Teaching Professor. Globalization, political economy, political sociology, philosophy of social science, postmodernism and social reflection.

Maria delaluz Matus-Mendoza, PhD (*Temple University*). 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.

Jack Maxwell, MS (*Saint Joseph 's University*). Teaching Professor. Criminal investigations, policing, police administration, domestic violence.

Jordan McClain, PhD (*Temple University*). Assistant Teaching Professor. Media framing and music journalism; relationship between television and music; American popular culture; celebrity, consumerism, and consumer behavior; branding, brand positioning, and advertising criticism.

Margaret McClure, PhD (*University of California at Berkeley*). Assistant Teaching Professor. Research methods, sociology of the family, deviance, military sociology.

Usha Menon, PhD (*University of Chicago*). Associate 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.

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

Anne-Marie Obajtek-Kirkwood, PhD (*University of Pennsylvania*). Associate Professor. French and francophone 20th and 21st century literature, culture and film. Representations of the Occupation (WWII); war; minorities in France; autobiography; feminist issues.

Rakhmiel Peltz, PhD (*Columbia University, Linguistics; University of Pennsylvania, Biological Sciences*) Director of *Judaic Studies Program*. Professor. Sociolinguistics, ethnography of communication, social history of Yiddish language and culture, Yiddish culture of Eastern Europe, language planning, language and ethnic identity, language and group memory, aging and ethnicity, history of urban neighbors.

Douglas V. Porpora, PhD (*Temple University*). Professor. International political economy, culture, social theory, and philosophy of social science.

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.

Devon Powers, PhD (*New York University*). Assistant Professor. Popular music, cultural intermediaries, promotional culture, 20th-century history, journalism studies.

Rachel R. Reynolds, PhD (*University of Illinois at Chicago*). Associate Professor. Sociolinguistics, ethnography of communication, intercultural communication, globalization and the rhetoric of community, political economy of immigration, race and ethnicity, new African immigrants in the United States, Igbo studies.

Cynthia Reed Rickards, MS (*St. Joseph's University*) *Criminal Justice Program*. Assistant Teaching Professor. On-line pedagogy; service-learning pedagogy; juvenile justice; domestic violence.

David Ridgway, MS (*St. Joseph's University*). Instructor. Deviant behaviors, social problems.

Rosemary Rys, MA (*Glassboro State College (now Rowan University)*). Instructor. Public relations and marketing.

Simone Schlichting-Artur, EdD (*University of Pennsylvania*) Assistant Department Head, *Culture and Communication*. 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.

Mimi Sheller, PhD (*New School for Social Research*) Director of the *Mobilities Research and Policy Center at Drexel University*. 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.

Natsumi Shor Assistant Teaching Professor. Business and professional Japanese; Japanese film and culture; interrelation between Japanese language to the nation's culture and thought.

Wesley Shumar, PhD (*Temple University*) Department Head, *Culture and Communication*. Professor. Ethnography of cyberspace, online learning communities, political economy of higher education, globalization, activity theory, semiotics, critical realism, psychoanalysis, identity and the self.

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.

Lawrence Souder, PhD (*Temple University*). Associate Teaching Professor. Science and technical writing, communication ethics.

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

Judith Storniolo, PhD (*University of Pennsylvania*). Teaching Professor. Historical and comparative linguistics, Mesoamerican languages and culture, applied anthropology, public policy, oral traditions and narratives, ideology and ritual, Mesoamerican ethnohistory; and pre-Columbian literature.

Asta Zelenkauskaitė, PhD (*Indiana University*). Assistant 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.

Interdepartmental Faculty

Tony H. Grubestic, PhD (*The Ohio State University*) Director of the Center for *Spatial Analytics and Geocomputation (CSAG)*. Professor. Geographic information science, spatial analysis, development, telecommunication policy, location modeling.

Michelle Sahl, PhD, MEd, MBA, MBE (*The University of the Sciences in Philadelphia*). Associate Teaching Professor. Health management and policy: management and leadership of health services organizations, urban health, and the history of health care systems.

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 institutions (e.g. family, education, religion, political and economic systems) as well as theories and methods of guiding sociological investigation.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SOC 110 Sociology of the Future 3.0 Credits

Examines current theories, trends and projections for social change in the coming decades. Focuses on the role played by such factors as technological advancement, climate change, global capitalism and social movements in shaping the future.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SOC 115 Social Problems 3.0 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 120 Sociology of the Family 3.0 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 125 Sociology of Aging 3.0 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 137 Issues in Science and Religion 3.0 Credits

This survey course examines the interconnections and differences of science and religion, including the scientific and religious theories of such topics as Cosmology, Human Origins, Prayer and Consciousness. Fundamental to the exploration of these theories are the examination of the historical, philosophical, psychological and sociological implications of these topics for society.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SOC 150 Sex and Society 3.0 Credits

This course examines how sexualities are socially produced and reproduced. 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 204 Criminology 3.0 Credits

Criminology is the scientific study of crime, criminal behavior and societal responses to crime and to crime victims. Students will study theories of crime causation, crime types, ethics of research, data collection and methods of crime prevention and control. Issues such as capital punishment, gun control and restorative justice will be debated.

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 and Ethnic Relations 3.0 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 3.0 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 3.0 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 225 Sociology of Technology & Aging 3.0 Credits

This course will provide and introduction to the emerging field of "gerontechnology," i.e., technological tools designed to help older and chronically ill persons maximize their independence and manage their health issues. Special attention will be paid to the social, policy, design and ethical aspects of technology acceptance and implementation.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SOC 230 Women & Men in a Changing Society 3.0 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 3.0 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

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: SOC 101 [Min Grade: D] or ANTH 101 [Min Grade: D]

SOC 240 Urban Sociology 3.0 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 250 Research Methods I 3.0 Credits

Covers research design, measurement, sampling, survey research, field experiments, content analysis, interviewing techniques and ethics pertaining to research on human subjects. Prepares students to carry out simple empirical research projects as well as to become more sophisticated readers of sociological research.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

SOC 260 [WI] Classical Social Theory 3.0 Credits

Critically examines the ideas of the classical sociological theorists (e.g., Marx, Durkheim, and Weber). This is a writing intensive course.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SOC 268 Sociology of Sport 3.0 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 270 Theory of Applied and Community Sociology 3.0 Credits

Introduces the theory and methods of participatory research, focusing on exemplary case studies. The roots of participatory sociology in liberation theology, feminism, and Deweyian pragmatism are presented.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SOC 275 Issues in Domestic Violence 3.0 Credits

Domestic Violence is a major public health problem. This course will describe DV in the context of multiple response systems including health care, police, advocacy, and criminal justice. We will explore how DV affects men, women and children and examine societal conditions that allow DV to occur and continue.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SOC 310 Topics in Political Sociology 3.0 Credits

Examines social bases of politics; political power, bureaucracy, and social structure; sources and development of democracy and dictatorship; and political attitudes, movements, and parties.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 4 times for 12 credits

Restrictions: Cannot enroll if classification is Freshman

SOC 311 Topics in Sociology of Religion 3.0 Credits

Examines the sociological basis of religion, religious thought and movements as well as the organization and social function of religion on social institutions and groups.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 4 times for 12 credits

SOC 312 Topics in Sociology of Science and Technology 3.0 Credits

Examines the sociological basis of scientific theorizing, knowledge production and research as well as the organization and social function of scientific labor and the impact of applied science on social institutions and groups.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 4 times for 12 credits

SOC 315 HIV/AIDS and Africa 3.0 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 320 Sociology of Deviant Behavior 3.0 Credits

Examines theories of deviance, focusing on their attribution of causation and the implications for correction and/or control at both the individual and societal levels. Includes topics such as alcoholism, mental illness, criminality, and other deviant behaviors.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

SOC 325 Introduction to Urban and Environmental Planning 3.0 Credits

This course serves to introduce students to the field of urban and environmental planning. In doing so, this course seeks to expose students to the skill sets used by planners: including the planning process; citizens participation models; community needs assessment; data analysis and presentation; plan implementation and evaluation; and professional ethics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

SOC 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

SOC 330 Developing Nations and the International Division of Labor 3.0 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 I 3.0 Credits

First course of a two-term sequence. 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 336 Sociology of Education II 3.0 Credits

Continues SOC 335. Students will be involved as literacy coaches tutoring critical literacy skills. Upon completion of 40 hours of tutoring, students will receive a Certificate of Literacy Teaching.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: SOC 335 [Min Grade: D]

SOC 340 Globalization 3.0 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 3.0 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 343 The American Experience of the Wilderness 3.0 Credits

Focuses on the ecological systems and the biodiversity; various social constructions and ideologies surrounding the idea of wilderness that inform practices toward nature; and the development of wilderness protection efforts.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SOC 344 Social Movements 3.0 Credits

Focuses on historical and social processes by which social movements arise, set in motion of social change, and the outcomes of social movement efforts.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

SOC 345 Sociology of the Environment 3.0 Credits

Examines acts of nature vs. acts of man, food and health, environmental politics, social movements and environmental issues, environmental and development policies, and environmental and global change.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

SOC 346 Environmental Justice 3.0 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 347 Introduction to Environmental Policy Analysis 3.0 Credits

Introduction the development and implementation of U.S. environmental policy, including historical development, political process, methods of analysis and creation of laws, regulations and budgets.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

SOC 349 Sociology of Disasters 3.0 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 350 Research Methods II 3.0 Credits

Building on Research Methods (SOC 250) this course provides the student with the opportunity to apply research methods by implementing their own individual and group projects. Focus is on research design, developing research questions and hypotheses, instrument construction, data collection, simple data analysis and reporting.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: SOC 250 [Min Grade: D]

SOC 364 Computer-Assisted Data Analysis 3.0 Credits

This course focuses on using specialized software for organizing and manipulating empirical databases as well as performing basic applied statistical analyses. Attention will be paid to the selection, set up, execution and interpretation of procedures for both univariate and bivariate analysis. These procedures will include, but not be limited to, univariate measures of central tendency and dispersion; categorical data analysis; t-tests and crosstabulation.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: SOC 250 [Min Grade: D]

SOC 365 Computer-Assisted Data Analysis II 3.0 Credits

Building on SOC 364, this course 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: SOC 364 [Min Grade: D]

SOC 370 Practicum in Applied and Community Sociology 0.5-5.0 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 380 Special Topics in Sociology 3.0 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 395 Seminar in Sociology 3.0 Credits

The sociology majors' seminar is taken every year for repeating credit. A peer monitored seminar in which students discuss and support each other's research and scholarship. It features guest faculty and non faculty discussants, and provides majors with a focused exposure to the process of research and scholarship.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 5 times for 15 credits

Restrictions: Can enroll if major is SOC.

SOC 435 Seminar - Organization of American States 3.0 Credits

Prepares students to participate in a model session of the Organization of American States (OAS). Covers international political economy, structure and operation of OAS, characteristics of designated country, and public speaking and debate. Open to students in international area studies and sociology. May be repeated for credit.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Restrictions: Can enroll if major is COMM or major is IAS or major is SOC.

SOC 460 [WI] Contemporary Social Theory 3.0 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 260 [Min Grade: D]

SOC 470 Social Change & Planning 3.0 Credits

This course will focus on sociological scholarship that either explains social change or seeks to promote social change through applied research or planning. The format of the course is an advanced seminar in which students will produce a series of participatory reaction papers to a variety of presentations by faculty and guest presenters.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if classification is Senior.

SOC 490 Sociology Research Seminar I 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.

SOC 491 Sociology Research Seminar II 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 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 495 Directed Studies in Sociology 0.5-12.0 Credits**

Provides supervised study that allows students to explore topics of their own choosing individually.

College/Department: College of Arts and Sciences**Repeat Status:** Can be repeated multiple times for credit

Minor in Women's Studies

The minor in women's studies is intended to give students a broad, interdisciplinary understanding of the ways in which gender interacts with race, age, class, and sexual orientation to shape human consciousness and the social, political, and cultural organization of society. In addition, the minor is intended to enrich the educational experience of students. It may also provide both men and women with tools for understanding and coping with the larger societal systems in which they must operate as both students and professionals. Because business and industry are increasingly sensitive to issues such as sex discrimination, sexual harassment, equal pay for comparable work, parental leave, and day care, students with a minor in women's studies will have a definite edge over other applicants for managerial and policy-making positions.

Required Courses

WMST 101	Introduction to Women's Studies	3.0
WMST 301	Seminar in Feminist Theory	3.0

Approved Electives*

Select six of the following: 18.0

CJ 274	Sex, Violence & Crime on the Internet	
CJ 275	Issues in Domestic Violence	
CJ 362	Gender, Crime and Justice	
ENGL 355 [WI]	Women and Literature	
HIST 224	Women in American History	
PSY 356	Women's Health Psychology	
SOC 230	Women & Men in a Changing Society	
WMST 220	Writing on the Body	
WMST 225	Women and Human Rights Worldwide	
WMST 230	Arab Women Writers	
WMST 235	African Francophone Women Writers	
WMST 240	Women and Society in a Global Context	
WMST 250	African American Herstories	
WMST 260	Gender and Judaism	
WMST 275	Women's Health & Human Rights	
WMST 280	Special Topics in Women's Studies	
WMST 299	Independent Study in Women's Studies	

WMST 308 Queer Theory

WMST 320 Masculinities

Total Credits 24.0

* Chosen from an approved list including departmentally cross-linked courses and WMST 280 (Special Topics) courses.

** By permission only.

Minor in World History and Politics

This minor introduces students to the historical and political development of societies beyond the American and European context. The 20th-century experiences of decolonization, modernization, and development in Africa, Asia, Latin America, and the Islamic world are given special attention.

Required Courses

Select one of the following: 3.0

HIST 162 Themes in World Civilization II

HIST 163 Themes in World Civilization III

HIST 267 Twentieth Century World I

HIST 268 Twentieth Century World II

Two Upper-Level World History Courses 6.0

Some examples of upper-level World History courses are:

HIST 238 The Vietnam War

HIST 244 Twentieth Century Russia & the USSR

HIST 254 Russian History Before 1900

HIST 263 The World and China

HIST 264 East Asia in Modern Times

HIST 270 [WI] Introduction to Latin American History

HIST 271 History of Mexico

HIST 272 Ancient and Colonial Mexico

HIST 273 Modern Mexico

HIST 274 Conquest of Mexico

Three International Political Science Courses 9.0-10.0

Some examples of international Political Science courses are:

PSCI 150 International Politics

PSCI 240 Comparative Government

PSCI 323 Comparative Political Thought

PSCI 340 Politics of Developing Nations

PSCI 344 Introduction to 20th Century Middle East

PSCI 345 Comparative Politics of the Middle East

PSCI 351 International Organizations: The United Nations

PSCI 352 Ethics and International Relations

PSCI 353 International Human Rights

PSCI 358 Political Economy of Japan

PSCI 377 Politics of Latin America

Additional Requirements

Two courses, one course each from two of the following areas: 6.0

English

ENGL 203 Post-Colonial Literature I

[WI]

ENGL 204 Post-Colonial Literature II

ENGL 325	Topics in World Literature
Economics	
ECON 342	Economic Development
Anthropology, International Area Studies, Sociology	
ANTH 101	Introduction to Cultural Diversity
ANTH 210	Worldview: Science, Religion and Magic [WI]
ANTH 310	Societies In Transition: The Impact of Modernization and the Third World
IAS 360	Special Topics in World Civilization
SOC 330	Developing Nations and the International Division of Labor
Music	
MUSC 331	World Musics
Art History	
Any Appropriate Art History (ARTH) course	
Total Credits	24.0-25.0

Certificate in Medical Humanities

Certificate Level: Undergraduate

Admission Requirements: Drexel students only

Certificate Type: Certificate

Number of Credits to Completion: 18.0

Instructional Delivery: Campus

Calendar Type: Quarter

Expected Time to Completion: 1 year

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 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 and other student advisors 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:

Emilie S. Passow, PhD
Department of English and Philosophy
College of Arts and Sciences, Drexel University
ep43@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	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 395	Special Topics in Africana Studies (Race, Disease, and History)	
AFAS 395	Special Topics in Africana Studies (HIV/Aids in Africa)	
ANTH 210	Worldview: Science, Religion and Magic [WI]	
ANTH 220	Aging In Cross-Cultural Perspective	
ARTH 320	Art in the Age of Technology	
ARTH 465	Special Topics in Art History [WI]	
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	
Total Credits		18.0

Philosophy in Science and Technology Certificate

Certificate Level: Undergraduate

Admissions Requirements: Current Drexel students only

Certificate Type: Undergraduate

Number of Credits to Completion: 18.0

Instructional Delivery: Online, Campus, Hybrid

Calendar Type: Quarter

The Certificate in Philosophy in 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.

Required Courses

PHIL 101	Introduction to Western Philosophy	3.0
PHIL 105	Critical Reasoning	3.0
PHIL 107	Philosophy and Knowledge Organization	3.0
PHIL 351	Philosophy of Technology	3.0
PHIL 355	Philosophy of Medicine	3.0
Select one of the following:		3.0
PHIL 361	Philosophy of Science	
PHIL 371	Philosophy of Social Sciences	
Total Credits		18.0

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 Propositional Logic 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 Predicate Logic 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 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: Not repeatable 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: Not repeatable 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: Not repeatable 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 221 Epistemology 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 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 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 Communication Ethics 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 Computer Ethics 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 or Sophomore

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

Restrictions: Cannot enroll if classification is Freshman

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 Ethical Issues in Criminal Justice 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 Philosophy of the Environment 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 371 Philosophy of Social Sciences 3.0 Credits

Studies social scientific theory-construction and investigative methods from a philosophical standpoint, considering issues such as the distinction between explanation and interpretation, 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

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 395 Advanced Topics in Logic 3.0 Credits

Specialized topics, from among: self-reference paradoxes, set theory, axiomatization of arithmetic, computability, Church-Turing thesis, Gödel's theorem, minds and machines, Turing test, artificial intelligence, definitions of truth, models and satisfaction, analyticity, syntax/semantics, ontological commitment, intention/extension, reference justifying deduction, nominalism/realism, multi-valued logic, intuitionism, modal logic, doxastic logic, and logic of moral discourse.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 2 times for 6 credits

Restrictions: Cannot enroll if classification is Freshman or Sophomore

Prerequisites: PHIL 111 [Min Grade: D] and PHIL 207 [Min Grade: D]

PHIL 399 Independent Project in Philosophy 1.0-12.0 Credit

Provides directed reading and writing in philosophy.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 2 times for 6 credits

Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore

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 425 [WI] Seminar in Medieval Philosophy 3.0 Credits

Advanced study and discussion of the works of the leading philosophers and philosophical schools of the Medieval period. 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 Rationalism & Empiricism 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 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 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 465 [WI] Seminar in American Philosophy 3.0 Credits

Advanced study and discussion of works by leading American philosophers, including Peirce, James, Mead, Royce, C.I. Lewis, Quine, Davidson, Rorty and others. 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 475 Special Problems in Philosophy 3.0 Credits

Topic for each term to be announced. May be repeated for credit.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Restrictions: Cannot enroll if classification is Freshman or Sophomore

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 3 times for 9 credits

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 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 3 times for 9 credits

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 497 [WI] Senior Essay I: Research & Thesis 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]

Philosophy in Arts & Humanities Certificate

Certificate Level: Undergraduate

Admissions Requirements: Current Drexel students only

Certificate Type: Undergraduate

Number of Credits to Completion: 18.0

Instructional Delivery: Campus, Online, Hybrid

Calendar Type: Quarter

The Certificate in Philosophy in Arts and Humanities 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 the arts and the humanities.

Required Courses

PHIL 101	Introduction to Western Philosophy	3.0
PHIL 105	Critical Reasoning	3.0
PHIL 107	Philosophy and Knowledge Organization	3.0
PHIL 231	Aesthetics	3.0
PHIL 381 [WI]	Philosophy in Literature	3.0
Select one of the following:		3.0
PHIL 385	Philosophy of Law	
PHIL 391	Philosophy of Religion	

Total Credits **18.0**

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 Propositional Logic 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 Predicate Logic 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 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: Not repeatable 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: Not repeatable 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: Not repeatable 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 221 Epistemology 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 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 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 Communication Ethics 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 Computer Ethics 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 or Sophomore

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

Restrictions: Cannot enroll if classification is Freshman

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 Ethical Issues in Criminal Justice 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 Philosophy of the Environment 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 371 Philosophy of Social Sciences 3.0 Credits

Studies social scientific theory-construction and investigative methods from a philosophical standpoint, considering issues such as the distinction between explanation and interpretation, 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

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 395 Advanced Topics in Logic 3.0 Credits

Specialized topics, from among: self-reference paradoxes, set theory, axiomatization of arithmetic, computability, Church-Turing thesis, Gödel's theorem, minds and machines, Turing test, artificial intelligence, definitions of truth, models and satisfaction, analyticity, syntax/semantics, ontological commitment, intention/extension, reference justifying deduction, nominalism/realism, multi-valued logic, intuitionism, modal logic, doxastic logic, and logic of moral discourse.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 2 times for 6 credits

Restrictions: Cannot enroll if classification is Freshman or Sophomore

Prerequisites: PHIL 111 [Min Grade: D] and PHIL 207 [Min Grade: D]

PHIL 399 Independent Project in Philosophy 1.0-12.0 Credit

Provides directed reading and writing in philosophy.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 2 times for 6 credits

Restrictions: Cannot enroll if classification is Freshman or Pre-Junior or Sophomore

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 425 [WI] Seminar in Medieval Philosophy 3.0 Credits

Advanced study and discussion of the works of the leading philosophers and philosophical schools of the Medieval period. 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 Rationalism & Empiricism 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 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 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 465 [WI] Seminar in American Philosophy 3.0 Credits

Advanced study and discussion of works by leading American philosophers, including Peirce, James, Mead, Royce, C.I. Lewis, Quine, Davidson, Rorty and others. 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 475 Special Problems in Philosophy 3.0 Credits

Topic for each term to be announced. May be repeated for credit.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Restrictions: Cannot enroll if classification is Freshman or Sophomore

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 3 times for 9 credits

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 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 3 times for 9 credits

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 497 [WI] Senior Essay I: Research & Thesis 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]

Certificate in Writing and Publishing

Certificate Level: Undergraduate

Admission Requirements: Current Drexel students only

Certificate Type: Certificate

Number of Credits to Completion: 18.0

Instructional Delivery: Campus, Online, Hybrid

Calendar Type: Quarter

About the program

The certificate in writing and publishing (CWP) offers 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

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 for students who do not wish to specialize in either of the other two tracks.

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]	Message Design and Evaluation	3.0
or COM 375	Grant Writing	
Select one of the following:		3.0
COM 320 [WI]	Science Writing	
COM 420	Technical Editing	
COM 380	Special Topics in Communication Theory	
Select one of the following:		3.0
WRIT 400 [WI]	Writing in Cyberspace	
WRIT 310	Literary Editing & Publication	
COM 335	Electronic Publishing	
COM 340	Desktop Publishing	
Select two of the following:		6.0
COM 260 [WI]	Fundamentals of Journalism	
COM 300 [WI]	On-line Journalism	
COM 315	Investigative Journalism	
COM 390 [WI]	Global Journalism	
WRIT 220 [WI]	Creative Nonfiction Writing	
WRIT 225 [WI]	Creative Writing	
WRIT 301 [WI]	Writing Poetry	
WRIT 302	Writing Fiction	
WRIT 303	Writing Humor and Comedy	
WRIT 304 [WI]	Special Topics in Writing	
WRIT 306	Writing About the Media	

Total Credits 18.0

Technical Communication and Publishing

Required Courses

COM 310 [WI]	Technical Communication	3.0
COM 375 [WI]	Grant Writing	3.0
Select one of the following:		3.0

COM 320 [WI]	Science Writing	
COM 350 [WI]	Message Design and Evaluation	
COM 380	Special Topics in Communication Theory	
COM 420	Technical Editing	
Select one of the following:		3.0
WRIT 310	Literary Editing & Publication	
WRIT 400 [WI]	Writing in Cyberspace	
COM 335	Electronic Publishing	
COM 340	Desktop Publishing	
Select any two additional Certificate in Writing and Publishing courses, including but not limited to the following:		6.0
COM 260 [WI]	Fundamentals of Journalism	
COM 300 [WI]	On-line Journalism	
COM 390 [WI]	Global Journalism	
COM 315	Investigative Journalism	
WRIT 220 [WI]	Creative Nonfiction Writing	
WRIT 301 [WI]	Writing Poetry	
WRIT 302	Writing Fiction	
WRIT 303	Writing Humor and Comedy	
WRIT 304 [WI]	Special Topics in Writing	
WRIT 306	Writing About the Media	
Total Credits		18.0

Journalism

Required Courses

COM 260 [WI]	Fundamentals of Journalism	3.0
Select two of the following:		6.0
COM 300 [WI]	On-line Journalism	
COM 315	Investigative Journalism	
COM 390 [WI]	Global Journalism	
Select one of the following:		3.0
WRIT 310	Literary Editing & Publication	
WRIT 400 [WI]	Writing in Cyberspace	
COM 335	Electronic Publishing	
COM 340	Desktop Publishing	
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 Editing	
WRIT 220 [WI]	Creative Nonfiction Writing	
WRIT 225 [WI]	Creative Writing	
WRIT 301 [WI]	Writing Poetry	
WRIT 302	Writing Fiction	
WRIT 303	Writing Humor and Comedy	
WRIT 304 [WI]	Special Topics in Writing	
WRIT 306	Writing About the Media	
Total Credits		18.0

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	Writing Fiction	
WRIT 303	Writing Humor and Comedy	
WRIT 304 [WI]	Special Topics in Writing	
WRIT 306	Writing About the Media	
Select one of the following:		3.0
WRIT 310	Literary Editing & Publication	
WRIT 400 [WI]	Writing in Cyberspace	
WRIT 405	Internship in Literary Publishing *	
COM 335	Electronic Publishing	
COM 340	Desktop Publishing	
COM 350 [WI]	Message Design and Evaluation	
Select any two additional Certificate in Writing and Publishing courses, including but not limited to the following:		6.0
COM 260 [WI]	Fundamentals of Journalism	
COM 300 [WI]	On-line Journalism	
COM 390 [WI]	Global Journalism	
COM 315	Investigative Journalism	
COM 270 [WI]	Business Communication	
COM 310 [WI]	Technical Communication	
COM 320 [WI]	Science Writing	
COM 350 [WI]	Message Design and Evaluation	
COM 420	Technical Editing	
COM 375 [WI]	Grant Writing	

Total Credits		18.0
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* WRIT 405 must be taken twice if no other publishing course is taken.

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
WRIT 310	Literary Editing & Publication	
WRIT 400 [WI]	Writing in Cyberspace	
WRIT 405	Internship in Literary Publishing *	
COM 335	Electronic Publishing	

COM 340	Desktop 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 Editing	
or COM 375	Grant Writing	
Track B		
COM 270 [WI]	Business Communication	
COM 375 [WI]	Grant Writing	
or COM 350	Message Design and Evaluation	
Journalism		
COM 260 [WI]	Fundamentals of Journalism	
Select one of the following:		
COM 300 [WI]	On-line Journalism	
COM 315	Investigative Journalism	
COM 390 [WI]	Global Journalism	
Total Credits		18.0

* WRIT 405 Must be taken twice.

** Students select two of the following course sequences from at least two different categories

Courses

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 220 [WI] Creative Nonfiction Writing 3.0 Credits

A writing workshop in which in which students will read and write nonfiction; emphasis is placed on experimenting with different forms 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

Restrictions: Cannot enroll if classification is Freshman

Prerequisites: ENGL 103 [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, plays, and personal essays. 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 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 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 105 [Min Grade: A]

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 304 [WI] 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 placed 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

Prerequisites: ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: A]

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 312 The Practice of Professional Writing 3.0 Credits

This seminar acquaints students with the broad spectrum of work in professional writing, including reading and discussion of assigned research on various aspects of writing, and panel discussions with guest speakers, experienced professional writers and managers who work writers. Students research a writing-related field or topic.

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 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 405 Internship in Literary Publishing 2.0 Credits

Internship in Literary Publishing offers students practical experience in journal publication. One such example is Painted Bride Quarterly, which is produced both electronically and in print.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 3 times for 6 credits

Prerequisites: ENGL 103 [Min Grade: D] or ENGL 105 [Min Grade: A]

Minor in Writing

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 writing minor will:

- obtain a strong background in theoretical perspectives and practices of writing and rhetoric, as well as reading;
- be able to select additional writing courses in a variety of areas of interest;
- 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;
- be better positioned to succeed as writers in their future professional and personal endeavors.

Required Courses

ENGL 340 [WI]	Classic Rhetoric	3.0
WRIT 225 [WI]	Creative Writing	3.0
WRIT 312	The Practice of Professional Writing	3.0
COM 210	Theory and Models of Communication	3.0
or ANTH 350	Anthropology of Language	
or PHIL 305	Communication Ethics	

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 [WI]	Post-Colonial Literature I	
ENGL 204	Post-Colonial Literature II	
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 210 [WI]	The Peer Reader in Context	

Theoretical Perspectives on Writing Courses

Select one of the following: 3.0

ANTH 330	Media Anthropology	
ANTH 350	Anthropology of Language *	
COM 220	Qualitative Research Methods	
COM 355	Ethnography of Communication	
EDUC 236	Early Literacy I	
EDUC 256	Teaching Writing Grades 4-8	
EDUC 326 [WI]	Language Arts Processes	
ENGL 340 [WI]	Classic Rhetoric	
PHIL 305	Communication Ethics *	
PSCI 335	Political Communication	
PSY 336	Psychology of Language	

Writing in Practice Courses

Select two of the following: 6.0

COM 260 [WI]	Fundamentals of Journalism	
COM 270 [WI]	Business Communication	

COM 310 [WI]	Technical Communication
COM 320 [WI]	Science Writing
COM 335	Electronic Publishing
CULA 412	Food Writing for Culinary Professionals
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 220 [WI]	Creative Nonfiction Writing
WRIT 301 [WI]	Writing Poetry
WRIT 302	Writing Fiction
WRIT 303	Writing Humor and Comedy
WRIT 304 [WI]	Special Topics in Writing
WRIT 306	Writing About the Media
WRIT 310	Literary Editing & Publication
WRIT 400 [WI]	Writing in Cyberspace

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 Anthropology 350, "Anthropology of Language," as a required course may not take it again as one of the electives; however, this student could take Philosophy 305, "Communication Ethics," as an elective.

The College of Arts and Sciences

About the College

The College of Arts and Sciences is committed to providing high-quality education in the humanities, social sciences, natural sciences and mathematics.

By pursuing excellence in research and scholarship, we train our graduate students to become ethical professionals with expertise in particular areas of inquiry and an appreciation for the fundamental interactions among disciplines in a fast-changing, challenging, and diverse world.

The College of Arts and Sciences (<http://drexel.edu/coas>) was established in 1990, with the merger of the College of Sciences and the College of Humanities and Social Sciences. The college's educational objectives encompass a wide range of goals: to provide interdisciplinary study in the arts and sciences for our Bachelor of Science and Bachelor of Arts majors; to provide general educational courses for the University's undergraduates; to offer Master of Science and Doctoral programs in selected areas of faculty and research strength; to promote research, teaching, and creative activities that cross disciplinary boundaries and enhance faculty expertise and the quality of the University's instruction; and to improve the quality of life for the University's community through co-curricular research and programming in the arts and sciences.

Majors

- Biological Sciences (MS, PhD)
- Chemistry (MS, PhD)
- Communication (MS)
- Communication, Culture and Media (PhD)
- Environmental Policy (MS)
- Environmental Science (MS, PhD)
- Mathematics (MS, PhD)
- Physics (MS, PhD)
- Psychology (MS, PhD)
- Psychology-Law (PhD/JD)
- Public Policy (MS)
- Publication Management (MS)
- Science, Technology and Society (MS)

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 pre-MBA Global Business English program (GLOBE), English for academic purposes, TOEFL and IELTS preparation, and other subjects.

The English Language Center offers academic language preparation for students who have admissible high school academic background but need further English language proficiency and through the International Gateway program, a pathway program combining 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 (<http://www.drexel.edu/elc>) 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

Biological Sciences

Master of Science: 45.0 quarter credits

Doctor of Philosophy: 90.0 (post-bachelor's) or 45.0 (post-master's) quarter credits

About the Program

The Department of Biology (<http://www.drexel.edu/biology>) offers graduate programs in biological sciences leading to the doctorate degree and to the thesis or non-thesis master of science degree. The curricula and research programs are designed to help students achieve success in their degree programs and pursue positions of leadership in their respective fields of research.

The intellectual life of the department relies heavily on the participation, creativity and the energy of graduate students; therefore the department expects students to be vigorously involved in courses, seminars, journal clubs, research, informal discussions, and departmental functions.

MS in Biological Sciences

Degree Requirements

Soon after matriculation the student completes a plan of study with the advisor, outlining his or her specific program. Both thesis and non-thesis options are available. Conducting formal research necessary for the thesis is dependent upon the student finding a faculty member whom will serve as their faculty advisor and supervise a mutually agreed upon research project.

Students wishing to pursue PhD candidacy are encouraged to elect the MS with thesis. After all other requirements are completed, the research MS student defends the thesis at a final oral examination. The non-thesis student takes a comprehensive examination.

Requirements for the MS Curriculum with Thesis

BIO 500	Biochemistry I	3.0
BIO 532	Advanced Cell Biology	3.0
BIO 540	Readings in Molecular and Cellular Bioscience and Biotechnology	3.0
BIO 601	Research Methods	3.0

BIO 635	Advanced Genetics and Molecular Biology	3.0
BIO 679	Issues in Scientific Research	3.0
BIO 997	Research in Bioscience	9.0
ENVS 506	Biostatistics	3.0
Five Bioscience (BIO) or Environmental Science (ENVS) electives		15.0
Total Credits		45.0

Requirements for the Non-thesis MS Curriculum

BIO 500	Biochemistry I	3.0
BIO 532	Advanced Cell Biology	3.0
BIO 635	Advanced Genetics and Molecular Biology	3.0
BIO 679	Issues in Scientific Research	3.0
ENVS 506	Biostatistics	3.0
Bioscience (BIO) or Environmental Science (ENVS) electives *		30.0
Total Credits		45.0

* *Non-thesis students may elect to take up to 4 credits of BIO 997 Research in Bioscience.

Bioscience Electives Include:

BIO 530	Microbial Genetics	5.0
BIO 566	Endocrinology	4.0
BIO 610	Biochemistry of Metabolism	3.0
BIO 615	Proteins	3.0
BIO 620	Biomembranes	3.0
BIO 625	Nucleic Acids	3.0
BIO 631	Bioinformatics I	3.0
BIO 644	Human Genetics	3.0
BIO 646	Stem Cell Research	3.0
BIO 649	Recombinant DNA Laboratory	5.0
BIO 650	Virology	3.0
BIO 663	Molecular Mechanisms of Neurodegeneration	3.0
BIO 670	Medical Microbiology	3.0
BIO 675	Advanced Immunology	3.0
BIO 680	Special Topics	9.0

PhD in Biological Sciences

The Doctor of Philosophy in Biological Sciences is conferred in recognition of breadth of scholarship and scientific attainment plus demonstrated ability to complete original research.

The following general requirements must be satisfied in order to complete the PhD program in Biological Sciences:

- 90 (post-bac) or 45 (post-MS) credit hours total
- establishing a plan of study
- 7 core courses
- additional courses dependent on advisor or committee recommendations
- candidacy exam/approval of dissertation proposal
- dissertation/thesis
- defense of dissertation/thesis
- a graduate research seminar presentation once a year for students in their second year and beyond.

Thesis Advisor/Plan of Study

For students admitted without an identified thesis advisor, the thesis advisor must be selected by the end of winter term in the first year. All students are asked to submit a plan of study by the end of the winter quarter first year. It is anticipated that the graduate coursework will be completed during the first two years or less.

Students should check with the department for a list of available electives.

Core Requirement Courses:

BIO 500	Biochemistry I	3.0
BIO 532	Advanced Cell Biology	3.0
BIO 540	Readings in Molecular and Cellular Bioscience and Biotechnology	3.0
BIO 601	Research Methods	3.0
BIO 635	Advanced Genetics and Molecular Biology	3.0
BIO 679	Issues in Scientific Research	3.0
ENVS 506	Biostatistics	3.0
Total Credits		21.0

Sample Sequence/Sample Plan of Study**First Year**

Fall		Credits
BIO 500	Biochemistry I	3.0
BIO 532	Advanced Cell Biology	3.0
Term Credits		6.0

Winter

BIO 540	Readings in Molecular and Cellular Bioscience and Biotechnology	3.0
BIO 635	Advanced Genetics and Molecular Biology	3.0
Term Credits		6.0

Spring

BIO 601	Research Methods	3.0
ENVS 506	Biostatistics	3.0
Term Credits		6.0

Second Year

Fall		Credits
BIO 679	Issues in Scientific Research	3.0
Elective		3.0
Term Credits		6.0

Winter

BIO 620	Biomembranes	3.0
Term Credits		3.0

Spring

BIO 620	Biomembranes	3.0
Term Credits		3.0

Total Credit: 30.0

Contact the Department of Biology (<http://www.drexel.edu/coas/bioscience>) at (215) 895-2624 for more information.

Courses

BIO 500 Biochemistry I 3.0 Credits

Covers the fundamentals underlying the energetics and kinetics of macromolecular interactions of enzymes, membranes and nucleic acids in living systems.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

BIO 501 Biochemistry Laboratory I 2.0 Credits

Accompanies BIO 500.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 500 [Min Grade: C], BMES 501 [Min Grade: C] (Can be taken Concurrently)

BIO 509 Comparative Physiology Laboratory 2.0 Credits

Computational laboratory examining quantitative facets of vertebrate physiology through simulation experiments. Complements BIO 510 Comparative Physiology. Example systems examined include gas and solute exchangers, open vs. closed circulations, and thermoregulatory controllers.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 510 [Min Grade: C] (Can be taken Concurrently)

BIO 510 Comparative Physiology 3.0 Credits

Physiology of vertebrate and invertebrate animals focusing on how organisms meet environmental challenges (e.g., aquatic respiration). Focus is on mechanisms of homeostasis, particularly those significantly different from processes in human physiology.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

BIO 526 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

Prerequisites: BIO 500 [Min Grade: C]

BIO 530 Microbial Genetics 5.0 Credits

Covers genetic organization and regulation in viruses (primarily bacteriophages), bacteria, fungi, and algae; techniques of genetic manipulation of microbial genomes; genetic interactions of microbes under natural conditions; and the use of microbial modification in industrial processes.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 500 [Min Grade: C]

BIO 532 Advanced Cell Biology 3.0 Credits

This course covers the essentials of cell biology and discusses the life and behavior of cells in the context of the molecules that underlie and drive these processes. In particular, the course focuses on regulation and how integration and coordination is required for normal cell behavior.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 500 [Min Grade: C]

BIO 540 Readings in Molecular and Cellular Bioscience and Biotechnology 3.0 Credits

A reading course for first year graduate students based on current manuscripts from the primary literature. The goals of this course are for students to be exposed to the most current findings using primary literature, become skilled in critically reading the primary literature, and to gain experience in making presentation based on a set of papers.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 500 [Min Grade: C]

BIO 551 Genetic Regulation of 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

Prerequisites: BIO 500 [Min Grade: C]

BIO 562 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 500 [Min Grade: C]

BIO 565 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 from 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

Prerequisites: BIO 500 [Min Grade: C]

BIO 566 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 will be included.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

BIO 570 Teratology 3.0 Credits

This course will expand on the concepts of developmental biology by examining the agents that interfere with normal development. We will be exploring these agents through presentations and discussion of current peer reviewed literature. The focus will be on an understanding of mechanisms of action and how they are influenced by dose, pharmacology and genetics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

BIO 601 Research Methods 3.0 Credits

This course will provide graduate students in the biological and environmental sciences with the fundamentals needed to develop effective research questions and to design sound approaches to address these questions. A critical component of this course will be development of a research proposal with feedback from the instructor and student colleagues.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if major is BIO or major is ENVS.

BIO 610 Biochemistry of Metabolism 3.0 Credits

Covers how enzymes function and form metabolic pathways, how the pathways fit into cell physiology, and how these pathways are regulated. Overall considers how organisms digest nutrients and utilize them to support life. The terminology and technology commonly employed in contemporary biochemistry laboratories are emphasized.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 500 [Min Grade: C]

BIO 611 Biochemistry Laboratory II 2.0 Credits

Accompanies BIO 610.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Corequisite: BIO 610

BIO 613 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

BIO 615 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 500 [Min Grade: C]

BIO 616 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 and 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

Prerequisites: BIO 500 [Min Grade: C]

BIO 620 Biomembranes 3.0 Credits

Covers biochemical properties of membranes and membrane components, including phase properties, structure, organization, permeability, transport, and biosynthesis of membrane components.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 500 [Min Grade: C]

BIO 625 Nucleic Acids 3.0 Credits

Discusses nucleic acid biochemistry. Emphasizes nucleic acid separation techniques, sequencing, and synthesis techniques, as well as methods of physical analysis. Uses current and classical literature as information sources.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 500 [Min Grade: C]

BIO 630 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

Prerequisites: BIO 500 [Min Grade: C]

BIO 631 Bioinformatics I 3.0 Credits

This course uses a combination of lecture and hands-on exercises to develop computational, algorithmic, and database navigation skills utilized in the analysis of genes and genomes. Topics include genomic databases, genome annotation, sequence alignment, metagenomic analyses, and phylogenetics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

BIO 633 Bioinformatics I 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

Prerequisites: BIO 631 [Min Grade: C] (Can be taken Concurrently)

BIO 635 Advanced Genetics and Molecular Biology 3.0 Credits

Covers classical prokaryotic and eukaryotic genetics; DNA/RNA structure; DNA replication, transcription, translation and their regulation; major molecular techniques used in the analysis of genes and genomes. Includes readings from primary literature, covering recent advances and classical experiments in genetics, genomics and molecular biology.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 500 [Min Grade: C]

BIO 640 Biometry 3.0 Credits

Provides a computational introduction to probability and data analysis via descriptive and inferential statistics for biological scientists with an emphasis on understanding statistics as probability statements about the inherently noisy data commonly encountered by biologists.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

BIO 641 Data Analysis in Biosciences 3.0 Credits

Covers the application of computer programs to the analysis of biological data. Focuses on the use of software for microcomputers and mainframes (SAS) for analysis of data and interpretation of results. Also covers use of computers for experiment design. Offered once per year in alternate terms.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

BIO 642 Modeling Methods in Biology I 3.0 Credits

Offers practical experience in modeling simple biological systems. Presents applications of linear, trigonometric, and exponential functions in biology. Covers the use of differential and integral calculus, simple differential equations, and the Eulerian approach to simulation; emphasizes practical computational use of such tools in biological problems. Offered in alternate years.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 122

BIO 643 Modeling Methods in Biology II 3.0 Credits

Offers a practical introduction to modeling of dynamic biological processes, including deterministic and stochastic processes. Emphasizes the development and construction of working models of real biological systems and interpretation of results. Discusses both mechanistic and empirical/predictive models. Covers Euler and Runge-Kutta techniques, and feedback loops. Emphasizes practical simulation throughout. Allows students to develop their own model of a real-world biological process. Offered in alternate years.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if major is BMS.

Prerequisites: BIO 642 [Min Grade: C]

BIO 644 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 of cancer, gene therapy, stem cell research and human genomics and biotechnology.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 500 [Min Grade: C]

BIO 646 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 neurogenerative disorders, stem cells and ageing, and politics of stem cell research.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 500 [Min Grade: C]

BIO 648 Signal Transduction 3.0 Credits

This course will focus on the mechanisms of cell-cell communication and signal transduction in eukaryotic organisms. It will present an overview for the general mechanisms of different signaling pathways, and will also discuss in detail the molecular mechanisms by which these signal transduction pathways are regulated in a developmental context.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 500 [Min Grade: C]

BIO 649 Recombinant DNA Laboratory 5.0 Credits

This course gives a practical introduction to the basis of recombinant DNA manipulation in the laboratory. Students learn the theory behind how DNA functions and how to experimentally test these functions in the laboratory setting. Basic and advanced techniques are covered in this course.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 500 [Min Grade: C]

BIO 650 Virology 3.0 Credits

Discusses 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

Prerequisites: BIO 500 [Min Grade: C]

BIO 660 Microbial Physiology 3.0 Credits

Covers the physiology and metabolism of microorganisms. Emphasizes aspects unique to prokaryotes, including envelope structure, chemotaxis, transport systems, modes of nutrition, biosynthesis, growth, and mechanisms of action of antibiotics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 500 [Min Grade: C]

BIO 663 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.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 532 [Min Grade: C]

BIO 670 Medical Microbiology 3.0 Credits

Covers infectious diseases in humans, including mechanisms of pathogenicity, techniques of diagnosis, modes of transmission, and methods of treatment.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 500 [Min Grade: C]

BIO 675 Advanced Immunology 3.0 Credits

Covers failure in host defense, immunotherapies, clinical concepts in immunology, and emerging concepts in immunology research. Material is presented in a combination of a Lecture and Journal club format with a focus on class participation, presentation and discussion.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 526 [Min Grade: C]

BIO 679 Issues in Scientific Research 3.0 Credits

The course will cover topics related to the appropriate and correct conduct of personnel in a research setting. Issues will be discussed dealing with choosing a research mentor, how to record data, authorship and publication, and the correct and ethical treatment of animal and human subjects.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: BIO 500 [Min Grade: C]

BIO 680 Special Topics 9.0 Credits

Covers special topics of current interest on an individual or group basis.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

BIO 799 Independent Study 3.0 Credits

Provides independent study in Biological Sciences.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

BIO 864 Graduate Research Seminar 1.5 Credit

This research seminar is a forum for Biology PhD students to present on their research to faculty and graduate student peers. Discussion of the scientific content as well as feedback on presentation style and quality follows every presentation.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Restrictions: Can enroll if major is BIO or major is ENV5 and program is MS or MSES or PHD.

BIO 865 Biology Department Research Seminar 1.5 Credit

This weekly research seminar provides a forum for international and national leaders in Biology to present the latest finding from their specialty.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

BIO 898 Master's Thesis 0.5-20.0 Credits

Master's thesis.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

BIO 997 Research in Bioscience 0.5-20.0 Credits

Research.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

BIO 998 Ph.D. Dissertation 1.0-12.0 Credit

Ph.D. dissertation.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Chemistry

Master of Science: 45.0 quarter credits

Doctor of Philosophy: 90.0 quarter credits

About the Program

The Chemistry Department (<http://www.drexel.edu/coas/chemistry>) offers graduate programs in analytical chemistry, atmospheric chemistry, inorganic chemistry, organic chemistry, materials chemistry, physical chemistry, educational chemistry, and polymer chemistry. The curriculum is designed to prepare students for the research and practical application of chemistry to challenges facing mankind. The department also encourages interdisciplinary activities. Faculty members are active participants in the environmental engineering and science and biomedical science and engineering programs; others work with physicists and biologists in areas such as atmospheric science, biochemistry, and biophysical chemistry.

The chemistry faculty wants graduate students to understand the purpose of, and need for, fundamental research while working on problems of practical interest and application to the challenges facing mankind in the modern world. Areas of research include the use of digital electronic methods to analyze trace constituents of air and water, a study of the molecules of living systems, the effects of toxic chemicals and carcinogens, synthesis and characterization of compounds of medicinal and industrial interest, methods for studying macromolecules, and characterization of transient species using lasers.

The Chemistry Department strives to maintain a community of research scholars (faculty, postdoctoral fellows, and graduate and undergraduate students) that is large enough to provide a variety of experiences within chemistry, yet small enough to give each student individual attention. Both full- and part-time study are available.

Admission/Financial Assistance

Requirements for Admission

For admission to graduate study, the department requires a BS in chemistry or the equivalent. This requirement applies to full-time and part-time students working toward either the MS or the PhD degree. All entering MS and PhD students are required to take a series of two-hour exams in analytical, inorganic, organic, and physical chemistry to help assess their preparation for graduate work in chemistry. The scores obtained on these exams are used as a basis for course selection.

It is strongly recommended that students submit Graduate Record Examination (GRE) results with their application. GRE scores are helpful to the Chemistry Department and the Office of Admissions, and are required for those students requesting financial support, i.e., a teaching assistantship (TA) and/or would like to be considered for a Dean's Scholarship or a Provost's Fellowship.

Financial Assistance

Graduate students at Drexel can obtain two main types of financial support: teaching assistantships and research assistantships. Teaching assistantships are available on a competitive basis to incoming students and are normally renewable for several years. All those requesting financial assistance must submit GRE scores.

Forms, details about requirements, and information about application deadlines are all available on the Chemistry (<http://www.drexel.edu/grad/programs/coas/chemistry>) page of Drexel's Graduate Admissions website.

Master of Science in Chemistry

Degree Requirements

The MS degree is awarded after satisfactory completion of a minimum of 45.0 credit hours in chemistry and related fields, at least 30.0 credits of which must be taken at Drexel. Both thesis and nonthesis options are available.

Course Requirements

The course requirements for both thesis and nonthesis options are one complete sequence in the major area of interest; one of the sequence courses from each of analytical, organic, polymer, and inorganic chemistry; and two courses in physical chemistry. The remaining credits may be chosen from graduate courses within the department or from other departments offering courses related to the student's major areas.

Major Sequence 9.0

Select one of the following sequences:

Inorganic Chemistry

CHEM 521 Inorganic Chemistry I

CHEM 522 Inorganic Chemistry II

CHEM 523 Inorganic Chemistry III

Analytical Chemistry

CHEM 530 Analytical Chemistry I

CHEM 531 Analytical Chemistry II

CHEM 755 Mass Spectrometry

Organic Chemistry

CHEM 541 Organic Chemistry I

CHEM 542 Organic Chemistry II

CHEM 543 Organic Chemistry III

Physical Chemistry

CHEM 557 Physical Chemistry I

CHEM 558 Physical Chemistry II

CHEM 555 Quantum Chemistry Of Molecules I

Polymer Chemistry

CHEM 561 Polymer Chemistry I

CHEM 562 Polymer Chemistry II

CHEM 563 Polymer Chemistry III

Additional Sequence Courses* 15.0

Electives 21.0

Total Credits 45.0

* One of which must be chosen from the following: CHEM 555 Quantum Chemistry Of Molecules I or CHEM 557 Physical Chemistry I.

Thesis Option

Up to 9 credits of coursework may be replaced by either CHEM 997 (<https://nextcatalog.drexel.edu/programadmin/213>) or by sections of CHEM 680 (<https://nextcatalog.drexel.edu/programadmin/213>) involving laboratory research. No later than the spring term of the first year of coursework, a student should choose a research advisor with whom to work in carrying out an original investigation in chemistry. The results will be written up in thesis form and submitted to an MS thesis committee consisting of the research advisor and two other departmental faculty appointed by the advisor. The acceptance by this committee of the MS thesis completes the thesis option requirements for the MS degree. Students in the MS program receiving financial aid from the department must elect the thesis option if they do not pursue the PhD program at Drexel.

PhD in Chemistry

Degree Requirements

The PhD degree is awarded in any of eight main areas of chemistry: analytical, atmospheric, inorganic, organic, materials, physical, educational or polymer chemistry. The degree recipient must demonstrate scholastic breadth in chemistry and contribute significantly to scientific advancement in a chosen major area. Requirements of the program include coursework, candidacy examinations, a chemical information retrieval or technical writing course, and successful completion of a publishable PhD thesis.

Course Requirements

Ninety credits of graduate-level work must be completed for the PhD degree. The Chemistry Department requires 30 credits of coursework in chemistry (outlined in the Course Requirements section of the MS program). The balance can be made up of advanced special topics courses and research credits.

Candidacy Requirements

To become a candidate for the PhD in chemistry at Drexel, a student must pass a prescribed set of cumulative examinations.

Cumulative Examinations

Written examinations designed to test a student's background in his or her major area are given monthly during the academic year and occasionally during the summer at the discretion of the faculty. Students should begin

taking these examinations after having completed three courses in the major area (usually the main sequence courses), though beginning these exams earlier is possible for well-prepared students. Students normally begin taking these examinations in the fall term of their second year.

Research Seminar

The thesis proposal seminar is designed to help the student conduct his/her research more efficiently by (i) promoting a greater fundamental understanding about the student's own specific research project and (ii) providing context and perspective about previous accomplishments in the field by other research groups as well as her/his own. The subject of the seminar will be a literature review and a description/defense of the student's research project including results of experiments and investigations already conducted as well as future work. The examination at which the thesis proposal is defended is held no later than the end of the *winter* term of the *second* year for *full-time* students or the end of the *spring* term of the *second* year for *part-time* students. A written report is submitted to the committee no later than two weeks before the examination. A passing grade on this examination is required for continuation in the PhD program.

Thesis

A PhD thesis — the heart of the PhD degree — must be written, accepted by the research supervisor, presented to a PhD Thesis Examining Committee, and defended orally to the satisfaction of the Examining Committee. It is the responsibility of the student, not the research supervisor, to submit an acceptable thesis. It is expected that the student will have at least one peer-reviewed research article accepted for publication by the time of the thesis defense.

Facilities

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

Mass Spectrometry Laboratory

A Waters Autospec M high resolution mass spectrometer, a Sciex API triple quadrupole mass spectrometer, and a Bruker Autoflex III MALDI Time-of-Flight mass spectrometer.

Magnetic Resonance Laboratory

Varian INNOVA 300 MHz superconducting FT-NMR spectrometer, Varian INNOVA 500 MHz superconducting FT-NMR spectrometer, and a Varian X-band 12" EPR spectrometer.

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 MS detector, 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.

Atomic Force Microscopy

The department has a Veeco multimode Atomic force microscopy (AFM) for research and education. AFM, also called scanning force microscopy (SFM), is one of the foremost tools for imaging, measuring, and manipulating matter at the nanoscale. It is when a fine tip is scanned across a surface the tip-surface force is measured to provide topographic, frictional, and adhesion information of a surface. With the ability to perform non-invasive, high-resolution surface imaging and force measurement, AFM has become an essential characterization tool in multiple disciplines in life science, biomedical engineering, nanoengineering, chemistry, materials science, and other related fields.

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 620 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. Additional full-time support includes an instrument specialist (for NMR and MS), a glassblower (Chemistry Department), two electronics specialists (College of Arts & Sciences Electronics Shop), and four machinists (Drexel University Machine Shop).

Courses

CHEM 521 Inorganic Chemistry I 3.0 Credits

Covers the principal models of inorganic chemistry: structure and bonding, interactions in the solid state, coordination compounds, complexation equilibria, and acid-base models.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 522 Inorganic Chemistry II 3.0 Credits

Covers group theory in inorganic chemistry, including crystal field descriptions of transition metal chemistry and qualitative molecular orbital approach to and spectroscopic methods for inorganic molecules.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: CHEM 521 [Min Grade: C]

CHEM 523 Inorganic Chemistry III 3.0 Credits

Covers constitutions and properties of organometallic compounds, including carbonyls and nitrosyls. Also covers kinetic properties of mononuclear and biometallic centers. Includes computer modeling/display of inorganic structures.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: CHEM 522 [Min Grade: C]

CHEM 530 Analytical Chemistry I 3.0 Credits

Covers principles and techniques of optical methods of analysis.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 531 Analytical Chemistry II 3.0 Credits

Covers physical and chemical methods of separation, including distillation, solvent extraction, and chromatographic and ion-exchange techniques.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 532 Analytical Chemistry III 3.0 Credits

Covers electroanalytical principles and techniques of potentiometry, voltammetry, and coulometry.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 541 Organic Chemistry I 3.0 Credits

Covers spectroscopic methods for the determination of the structure of organic molecules.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 542 Organic Chemistry II 3.0 Credits

Covers static and dynamic stereochemistry; conformational theory; relationships between structure and reactivity in organic reactions; and applications to asymmetric synthesis, physical measurements, and biochemical mechanisms.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 543 Organic Chemistry III 3.0 Credits

Covers mechanisms of organic reactions and the techniques of studying them.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 551 Radiochemistry 3.0 Credits

Covers radioactivity; interaction of radiation with matter; radiation detectors; nuclear reactors; hot atom chemistry; carbon-14 dating; and neutron activation analysis and its applications to pottery dating, environment, lunar studies, and forensics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 554 Chemical Kinetics 3.0 Credits

Focuses on experimental and theoretical consideration of chemical reaction rates.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 555 Quantum Chemistry Of Molecules I 3.0 Credits

Covers general properties of operators; Schrodinger's equation and its solutions for a particle in a box; harmonic oscillator, tunneling problems, rigid rotor, and the hydrogen atom; approximation methods; and absorption of radiation and selection rules.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 557 Physical Chemistry I 3.0 Credits

Schrodinger's equation and particle-wave duality, atomic structure and spectra, optical spectroscopy on molecules (rotational, vibrational and electronic spectra) molecular symmetry, design of modern spectrometers, magnetic resonance spectroscopy.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 558 Physical Chemistry II 3.0 Credits

Covers statistical mechanics of distinguishable and indistinguishable particle systems, and thermodynamic functions for both systems and chemical equilibrium.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: CHEM 557 [Min Grade: C]

CHEM 561 Polymer Chemistry I 3.0 Credits

Covers step growth, polymerization (including polyesters, polycarbonate, nylon, epoxies, urethanes, and formaldehyde-based polymers), step growth kinetics, molecular weight distributions, infinite networks and gelation, techniques of polymerization, ring opening polymerization, thermodynamics of polymer solutions, biological polymers, inorganic polymers, biomedical applications, and electrically conducting polymers.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 562 Polymer Chemistry II 3.0 Credits

Includes chain growth polymerization (free radical, ionic, coordination, group-transfer, radiation-induced, and electrochemical polymerizations), kinetics of chain growth polymerization, molecular weight distributions, polymerization/depolymerization equilibria, techniques of polymerization, kinetics of polymerization, reactions of polymers, degradation of polymers, chain conformation and configuration, rubber elasticity, and copolymerization.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 563 Polymer Chemistry III 3.0 Credits

Covers polymer characterization and analysis; morphology; molecular weight determination, including end group analysis, and colligative properties (vapor pressure lowering, ebullometry, cryoscopy, osmometry); light scattering; viscosity; gel permeation chromatography; sedimentation; diffusion and permeation; polymer identification; plasticizers; x-ray diffraction; thermal behavior; and spectroscopic techniques.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: CHEM 561 [Min Grade: C]

CHEM 571 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

CHEM 656 Quantum Chemistry of Molecules II 3.0 Credits

Continues CHEM 555. Covers matrix theory and group theory, atomic structures, and self-consistent field methods including the Hartree-Fock theory. Introduces theory of chemical bonding.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: CHEM 555 [Min Grade: C]

CHEM 657 Quantum Chemistry of Molecules III 3.0 Credits

Continues CHEM 656. Covers the theory of chemical bonding, scattering theory, and detailed Hartree-Fock calculations.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: CHEM 656 [Min Grade: C]

CHEM 659 Physical Chemistry III 3.0 Credits

Covers interaction of molecules with electromagnetic radiation, including internal quantum states and structure of atoms and simple molecules, applications of atomic and molecular spectroscopy, and lasers in chemistry.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: CHEM 558 [Min Grade: C]

CHEM 680 Special Topics 9.0 Credits

Provides extended study of topics of particular interest to the class.

Taught by various members of the faculty as appropriate for the given topic. Covers topics including computers in chemistry, magnetic resonance, organic synthesis, electrochemistry, mass spectrometry, electronic materials, molecular modeling, atmospheric chemistry, metallobiochemistry, radiochemistry, heterocycles, and photochemistry of small molecules.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

CHEM 751 Magnetic Resonance In Chemistry 3.0 Credits

Covers basic principles of electron spin resonance and nuclear magnetic resonance; interpretation of chemical shifts, spin-spin couplings, and spin relaxation; and two-dimensional nuclear magnetic resonance.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 752 Biophysical Chemistry 3.0 Credits

Thermodynamics and kinetics to aqueous biological systems. Properties and behavior of biological macromolecules.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 753 Chemical Instrumentation 5.0 Credits

Provides hands-on training in the use of various spectroscopic (FT-IR, UV/VIS, fluorescence, AA), chromatographic (packed and capillary column GC, HPLC), and electrochemical (potentiometry, coulometry, polarography) techniques. Involves lectures with self-paced laboratory work.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Restrictions: Cannot enroll if classification is Freshman or Junior or Pre-Junior or Sophomore

CHEM 755 Mass Spectrometry 3.0 Credits

Covers basic interpretive skills for organic and biochemical analysis; basic ion optics design using SIMON; survey of ionization methods, ion selection or separation techniques, and detectors; and applications in chemistry and biology.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 767 Chemical Information Retrieval 0.5-20.0 Credits

Examines methods for retrieving literature information, via standard tabulations, journals, and abstracts, using 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 771 Organometallic Chemistry 3.0 Credits

Covers compounds with metal-carbon bonds, including molecular and electronic structures and bonding descriptions, constitutions, reactivities, and syntheses of main-group and transition metal carbonyl, alkene, alkyne, alkyl, and arene complexes and clusters.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: CHEM 521 [Min Grade: C]

CHEM 772 Inorganic Biochemistry 3.0 Credits

Covers chemistry of metal ions in biological systems and biomimetic ligands and complexes. Includes metal ion chemistry in aqueous environments and structure and behavior of metalloproteins.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: CHEM 521 [Min Grade: C]

CHEM 773 The Solid State 3.0 Credits

Covers types of bonding in solids, lattice specific heat, phonons, thermal conductivity, free electron gas, band theory of metals and semiconductors, intrinsic and extrinsic semiconductivity, and magnetic properties and superconductivity.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 774 Electrochemistry for Chemists 4.5 Credits

Covers potentiometric, coulometric, voltammetric, and potential-step methods for eliciting electron-transfer thermodynamic and kinetic information from chemical and biological systems.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 780 Nuclear Magnetic Resonance Laboratory 3.0 Credits

This course provides theory and technical applications of Nuclear Magnetic Resonance to the solution of structural problems in Chemistry.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 782 Electronics for Chemical Instrumentation 4.0 Credits

Covers digital electronics for chemical instrumentation, including Boolean algebra and its applications to digital circuits, implementation of basic Boolean operations with solid-state devices, and applications of digital circuits to chemical instrumentation.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 783 Electronics for Chemical Instrumentation II 3.0 Credits

Instrument components such as temperature, pressure, and light radiance controllers, etc. will be designed in the lectures and built and tested in the laboratory on the test board built by the student. It contains regulated +15, -15 and 5 regulated power supplies. Same sided wire wrap sockets allow amplifiers and other circuit elements to be easily and reliably mounted and connected. The test board belongs to the student.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 788 Atmospheric Radioactivity 0.5-20.0 Credits

Covers naturally occurring and anthropogenic radionuclides of significance in the earth's atmosphere, including their application as tracers of air mass movement, atmospheric dynamics, and other characteristics. Discusses important methods and techniques of measurement. Requires a term paper from students receiving 5 hours of credit.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 789 Experimental Design and Statistics in Chemistry 3.0 Credits

Covers descriptive statistics; single and multiple linear regression techniques for analytical calibration; analysis of variance methods; basic experimental design, including full and fractional factorial techniques; and experimental optimization using steepest ascent and simplex techniques.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 792 Advanced Organic Synthesis I 3.0-5.0 Credits

Covers organic functional group transformation and manipulation. Includes oxidations, reductions, additions to pi bonds, substitution reactions including aromatic substitutions, and reactions of electron-deficient intermediates.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

CHEM 793 Advanced Organic Synthesis II 3.0,5.0 Credits

Covers carbon-carbon bond forming reactions, organometallic reagents, cycloaddition reactions, and multistep synthesis of complex organic molecules including natural products.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

CHEM 794 Topics in Organic Reactor Mechanics 0.5-9.0 Credits

Covers current topics in organic reaction mechanisms, with emphasis on understanding the fundamental rules that govern the course and reactivity of chemical reactions.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Prerequisites: CHEM 541 [Min Grade: C] and CHEM 542 [Min Grade: C]

CHEM 796 Heterocyclic Chemistry 0.5-20.0 Credits

Explores general trends in the synthesis, reactions, and properties of oxygen, nitrogen, and sulfur heterocycles, with emphasis on their applications to the synthesis of bioactive materials.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: CHEM 541 [Min Grade: C]

CHEM 797 The Organic Chemistry of Sulfur and Selenium 0.5-20.0 Credits

Covers fundamentals of organosulfur and organoselenium chemistry, with emphasis on the application of these elements to asymmetric synthesis and the synthesis of natural products.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: CHEM 541 [Min Grade: C] and CHEM 542 [Min Grade: C]

CHEM 862 Topics in Inorganic Chemistry 0.5-9.0 Credits

Covers specialized principles of inorganic chemistry plus contemporary advances in the field. May be repeated for credit when topics vary.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

CHEM 865 Chemistry Research Seminar 9.0 Credits

Provides presentation and discussion of current research topics in chemistry.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

CHEM 866 Topics in Polymer Chemistry 3.0 Credits

Covers fundamental concepts in conductivity, magnetism and optical properties, or organic and polymeric materials; elements of the organic solid state; chemical and electrochemical synthesis; structure characterization; and properties and applications of these polymers.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

CHEM 868 Topics in Analytical Chemistry 5.0 Credits

Surveys new or developing instrumental or chemical analysis techniques. Covers spectroscopic, chromatographic, and/or electrochemical techniques for analysis of solutions or surfaces.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

CHEM 898 Master's Thesis 0.5-9.0 Credits

M.S. thesis.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

CHEM 997 Research 1.0-12.0 Credit

Requires students to select a topic for investigation and obtain the approval of the staff member in charge of the project. The hours and credits are determined for each individual.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

CHEM 998 Ph.D. Dissertation 1.0-12.0 Credit

Ph.D. dissertation.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Restrictions: Can enroll if major is CHEM.

Culture and Communication

Master of Science: 45.0 quarter credits

Doctor of Philosophy: 90.0 (Post-Bachelor's) or 45.0 (Post-Master's) quarter credits

About the Program

The MS in Communication program, with a hands-on approach, prepares students for careers in technical communication, science communication, and public communication. A scholarly track in communication, culture and media is also offered.

The PhD program in Communication, Culture and Media, having a more scholarly orientation, is designed to develop innovative scholar-teachers who know how to impart theories and studies on the interaction of social forces and communication. The program is designed to train socially committed researchers in quantitative and qualitative approaches to communication study.

Additional Information

Visit the Department of Culture and Communication (<http://www.drexel.edu/culturecomm>) website for more information.

Admission Requirements

MS in Communication

Applicants must meet the general requirements for admission to graduate studies. Applicants with a GPA below 3.0 must provide scores from the Graduate Record Examination. Prospective students must also submit with their applications a 1,500-word statement explaining why they want to enter the program. The program's screening committee carefully reads the essays to evaluate each applicant's writing skills and sense of purpose.

The program accommodates students from various backgrounds. For students without appropriate prior work experience, the program features a 6-month internship. For students applying with appropriate work experience, the internship requirement may be waived at the discretion of the Department's Graduate Committee.

PhD in Culture, Communication and Media

Applicants will be evaluated by the Department's Graduate Committee for admission to the program. Prospective students must submit with their application:

- a 1,500 word statement of purpose
- three letters of recommendation
- transcripts of all college-level coursework
- GRE scores
- for international students where English is not the official language, TOEFL or other English language proficiency scores are also required. For more information regarding international applicant requirements, view the International Students Admissions Information (<http://drexel.edu/issv/NewStudent.html>) page.

Minimum criteria include:

- Completion of a BA or BS degree in an appropriate field
- GPA of 3.0 or higher (preferred GPA 3.5 for courses in the major)
- For international students, a TOEFL score of 700 (100 iBT) or equivalent.

Students entering the program with a Master's degree or with some graduate credit will be evaluated by the Graduate Committee as to how many of their courses could possibly be counted toward the PhD.

Students entering with an MS in an appropriate field are required by the university to take a minimum of 15 credit hours in the PhD program before being eligible to take qualifying exams.

For additional information on how to apply to either of these programs, visit the Drexel University Requirements for Admissions (<http://www.drexel.edu/grad/programs/coas>) page.

Master of Science in Communication

Drexel's Master of Science in Communication program prepares students for careers in a wide range of professional activities. The program specializes in four areas:

- public communication
- communication, culture, and media
- technical communication
- science communication

Technical communication is for those seeking employment as technical writers, computer documentation specialists, and training specialists. Science communication has much to offer those who aspire to medical, science, and pharmaceutical writing. A concentration in public communication leads to careers in journalism and public relations. In addition, the program provides a strong foundation in theoretical approaches to communication. This theoretical basis is designed to ensure that, as the field changes, students will continue to have an intellectual framework for evaluating and implementing new technology and changing media. The communication, culture and media concentration parallels requirements in Drexel's PhD program, and prepares students for doctoral level work in the field.

Throughout the curriculum, in all the concentration options, students may use electives to increase communication skills, to broaden theoretical backgrounds, or to further develop areas of specialization.

Students can attend full time or part time, they can begin the program in any academic quarter, and they can complete all coursework in the evening. The program emphasizes flexibility, encouraging each student, in consultation with a faculty advisor to fashion a particular course of study.

The program accommodates students from widely varying educational backgrounds; many have backgrounds in science and mathematics, and an equal number come from humanities-related areas. Some students pursue their degrees while already working at demanding jobs.

Requirements

The MS degree requires 45.0 credits of coursework, a professional portfolio of three to five items developed by the student, and six months of internship for those who lack significant experience in communication related fields. For students in the communication, culture and media track, the internship may be a research internship done with a graduate faculty member.

Portfolio

As a final graduation requirement, each student must submit a professional exit portfolio. Based on coursework and professional assignments, the portfolio undergoes a rigorous process of review by faculty members and by a professional outside the university.

Internship

An internship is required and may be completed at any time during the student's tenure at Drexel. Students who need professional experience consult with their advisors and the program director to develop a suitable internship. Normally, this placement begins after the student has completed at least half the required coursework. Students who already have the equivalent of six months of professional experience or who gain the equivalent by working part time during their course of study can request exemption from this requirement.

Required Courses

COM 500	Reading & Res Communication	3.0
COM 610	Theories of Communication and Persuasion	3.0
Electives *		24.0

Required Concentration Courses 15.0

Students must select and complete one of the following concentration options:

Technical Communication

COM 510	Technical Writing
COM 570	Technical and Science Editing
COM 612	Ethics for Science and Technical Communication
COM 620	Message Design and Evaluation
COM 630	Software Documentation

Science Communication

COM 520	Science Writing
COM 570	Technical and Science Editing
COM 612	Ethics for Science and Technical Communication
COM 620	Message Design and Evaluation
COM 670	Medical Writing

Public Communication

COM 613	Ethics for Public Communication
COM 635	Electronic Publishing
COM 650	Telecommunications Policy in the Information Age
COM 663	Event Planning
COM 680	Public Relations Writing and Strategies

Communication, Culture, and Media

COM 710	Mass Communication and American Social Thought
COM 715	Media, Advocacy and Public Spaces
COM 725	Political Communication

Select 2 of the following:

COM 720	Critical Theory
COM 801	Seminar in Contemporary Theory
COM 802	Seminar in Discourse and Semiotics
COM 803	Seminar in Structural and Cultural Dynamics
COM 804	Seminar in Research Methodology
COM 805	Seminar in Communication Ethics

Total Credits 45.0

* Any appropriate graduate course offered in the University can serve as an elective if the student has sufficient background to take the course. In addition, the program offers its own elective courses including special topics (COM 690 (<https://nextcatalog.drexel.edu/graduate/collegeofartsandsciences/communicationcultureandmedia>)). Qualified students may also pursue independent study for elective credit in special cases.

PhD in Communication, Culture and Media

The PhD requires a minimum of 90.0 credits beyond a Bachelor's degree, including 45.0 credit hours of coursework prior to taking qualifying exams, 15.0 credit hours of coursework after exams, and 30.0 hours of research credits.

The PhD coursework is structured around a set of required core courses, a set of required seminars with rotating topics, and electives in graduate communication lecture courses, independent study work, and dissertation credit.

All students in the program take five common core courses. They then take no less than five courses chosen from the Culture and Communications (COM) seminar offerings. Students are encouraged to take additional seminars after meeting that requirement, since seminar courses enable collaborative relationships with professors and introduce students to the scholarly community.

After completing the core requirements and a sequence of seminars, students are expected to take a minimum of 10 additional courses from existing graduate level lecture courses (depending on their interests and research needs). Students may take up to two graduate courses (six credits) outside the department. Additional credits to meet the 90.0 credit requirements will come from independent study and dissertation credits.

Student advising will include appointments with both graduate director and an assigned mentor during the first two weeks of fall courses, where an individualized plan of study (University form D1) will be completed and approved by the program director.

Core Courses

COM 701	Contemporary Social Theory	3.0
COM 702	Communication Theory I	3.0
COM 703	Communication Theory II	3.0
COM 704	Research Methods in Communication	3.0
COM 705	Data Analysis in Communication	3.0

Seminars

Students select 15 credits from the five categories of seminars *

COM 801	Seminar in Contemporary Theory	3.0
COM 802	Seminar in Discourse and Semiotics	3.0
COM 803	Seminar in Structural and Cultural Dynamics	3.0
COM 804	Seminar in Research Methodology	3.0
COM 805	Seminar in Communication Ethics	3.0

Communication Lecture Electives 30.0

Ten courses are required, for a total of 30.0 credit hours of electives. These may be chosen from COM 500 to 800 level courses, including 800 level seminars that are a different topic from earlier courses taken.

Dissertation Credits/Additional Electives ** 30.0

COM 799 Independent Project in Technical and Science Communications

For the dissertation, students work with a principal advisor, one of the Culture and Communication Department faculty, and no less than two additional faculty from within the department. Students must find one additional outside reader, and students may bring in up to two outside readers.

Total Credits**90.0**

- * There are five categories of seminar: one in which students learn advanced work and influences on a specific theorist or theoretical school; one in which students learn about theories of language, discourse and the sign; one that teaches the paradigm of structural dynamics central to social sciences theory and research; one in which students study a research methods approach; and one that deals with approaches to research ethics. Students must take a seminar in each area (COM 801, COM 802, COM 803, COM 804, COM 805). Seminars can be repeated, with a maximum of three courses taken in each area, as long as the subject covered is different each time.
- ** Students may take up to two graduate-level courses outside of the Department of Culture and Communication.

Qualifying Examinations

After students have completed 45.0 credits, which will usually be at the end of their 6th term, they will be required to take a qualifying examination. The qualifying exam will be offered at the end of June will be composed of three parts: theory, methods and a content area. Students will be given the grade of fail, pass or high pass on the exam. A grade of pass in all three sections of the exam will be required to qualify for the PhD. Students who do not pass one out of three sections of the exam on the first attempt may retake the section that they failed one time to qualify for the PhD. If they do not pass the second time they take the failed section of the exam they will be dismissed from the program. When a student passes all three sections of the exam, the proper paperwork will be filed with the university graduate office and they will be advanced to candidacy.

Dissertation Defense

Students should defend the dissertation and graduate towards the end of their fifth or sixth year, during either the spring or summer quarters.

Visit the Department of Culture and Communication (<http://www.drexel.edu/culturecomm>) website for more information.

Courses**COM 500 Reading & Res Communication 3.0 Credits**

Introduces graduate study in the communication program. Presents issues and concepts for this course and other graduate courses. Focuses on issues such as reading complex texts, both theoretical and research-oriented. Also introduces the range of fields in professional communication.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 510 Technical Writing 3.0 Credits

An intensive workshop course in writing technical abstracts, proposals, manuals and reports. Focuses on developing reader-centered documents for a variety of audiences and purposes through the use of a number of styles. Aids students in developing greater awareness of the varieties of rhetorical situations and styles found in their careers.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 520 Science Writing 3.0 Credits

An intensive workshop course in communicating scientific information to the public, including reading and discussion of science journalism. Focus is placed on how to translate and reinterpret technical and scientific information for a general readership.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 530 Techniques and Science of Photography 3.0 Credits

Introduces the techniques of photography. Enhances students understanding of photography to better enable them to use photographs and services of photographers as communicative media.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 540 Technical and Science Graphics 3.0 Credits

Covers the design and production of graphic materials for technical and scientific purposes. Allows students to begin to understand the visual aspects of communication. Focuses on the use of type, art, and photographs to reinforce the written message.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 550 Video Production for Science & Technology 3.0 Credits

Introduce the techniques of studio and field video production for technical and science subjects. Teaches students to produce their own video for training purposes or information access.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 570 Technical and Science Editing 3.0 Credits

Covers techniques of formal editing, including project and copy editing. Requires students to read, discuss and edit numerous types of documents from professional, government and industry sources.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 605 Sports Journalism 3.0 Credits

This course enables students to gain a deeper understanding of the meaning-making power of sports journalism. In it, we explore the changing role of the sports journalist, from the mythmaking and hero-worship seen during the field's infancy, to the detachment and devotion to the craft of journalism that marked sports reporting beginning in the mid-20th Century.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 610 Theories of Communication and Persuasion 3.0 Credits

Examines the application of theories and models of communication and persuasion. Introduces theories underlying technical communication and issues informing the discipline. Draws readings from a number of disciplines, such as rhetoric, cognitive psychology, discourse analysis, linguistics, and communication.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 611 Interconnections: Science, Technology, Literature and the Arts 3.0 Credits

Examines issues concerning relations among science, technology, literature, and the arts, and leads students to learn something of the nature of science and technology and explore the contribution of literature, the arts, and aesthetic theory to effective science and the technical communication.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 612 Ethics for Science and Technical Communication 3.0 Credits

Studies principles and concepts of ethics for technical and scientific writers, editors and publishers. Examines moral presuppositions of the profession as they pertain to technical and scientific communications, to the effects of computer technologies on ethical practices in the workplace, and to the responsibilities of editors for preventing fraud.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 613 Ethics for Public Communication 3.0 Credits

This course is a seminar in journalism and public relations ethics. Topics discussed include: professional responsibilities of journalists with respect to truth-telling and objectivity in reporting the news; ethical issues surrounding morally offensive radio and television content; ethical issues concerning what is and is not covered by the news and manipulative advertising.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 616 Campaigns for Health and Environment 3.0 Credits

This reading and writing intensive, seminar-style course explores theories and practical aspects of environmental information campaigns and community-based social marketing campaigns. The theories and frameworks presented in this course apply to health issues as well as environmental issues. This course has a strong applied component.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 617 [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

COM 620 Message Design and Evaluation 3.0 Credits

Examines research and theory on the design of messages. Introduces research methodologies appropriate for the evaluation of scientific and technical communications. Examines research in document design and usability, testing and other strategies for collecting, analyzing and presenting data.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 625 Cultural Significance of Fame 3.0 Credits

This course explores our fascination with fame and celebrity, and the desire of so many people to achieve fame: from Alexander the Great to American Idol. Key issues include: the mass media's role in creating the cultural significance of fame, psychological characteristics of fame seekers, and changes in what it means to be a fan of the famous.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 630 Software Documentation 3.0 Credits

Teaches the principles and goals involved in writing, revising, and testing computer documentation, both paper and on-line. The focus will be on the end user documentation, although the principles involved may also apply to systems documentation.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 635 Electronic Publishing 3.0 Credits

Electronic Publishing gives students applied and theoretical knowledge of professional electronic publishing. Students will focus on issues relating to writing and integrating text and graphics to create websites and on-line publications. Students will also consider how issues in document design and usability analysis can be used to evaluate websites.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Cannot enroll if classification is Freshman or Junior or Pre-Junior or Sophomore

COM 640 Desktop Publishing 3.0 Credits

This course focuses on designing and developing publications using Desk Top publishing software. Students develop a publication plan for a specific organizational situation and learn basic design principles. Classes deal with planning, designing, writing and budgeting publications. Students concentrate on two major kinds of publications, brochures and newsletters, and will also learn about smaller publications.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 650 Telecommunications Policy in the Information Age 3.0 Credits

The historical, governmental, social, economic and political structures of telecommunications policies are examined. Special emphasis is placed on how assumptions concerning living in an information age affect policies, philosophies, structures and outcomes, especially at a global level.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 655 Ethnography of Communication 3.0 Credits

Following an examination of theories about interaction in speech, the course provides an in-depth look at qualitative communication studies. Both transcripts of talk in natural settings and videos of actual interactions will be used. Considers such topics as story telling (narrative), self-presentation in talk (performance and identity), the construction of gender in communication, literacy, and cross-cultural approaches to politeness.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 657 Media Effects Advanced Seminar 3.0 Credits

In this course we will examine the contemporary facts and the discourse on media effects. The focus will be on electronic media.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 660 Investigative Journalism 3.0 Credits

An intensive hands-on course in researching and writing investigative news stories. Students will select and cover beats and submit a series of in-depth articles on deadline.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 663 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.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 665 Journalists, 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 500 [Min Grade: C] and COM 660 [Min Grade: C]

COM 670 Medical Writing 3.0 Credits

Students learn about the major branches of medical writing and editing, for both medical and pharmaceutical contexts. The course includes the following topics: writing for professional, commercial and popular audiences, preparing FDA submissions, reading and researching medical literature, using medical statistics, interviewing subjects and writing ethically.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 673 Medical Journalism 3.0 Credits

This course teaches students how to research and write articles geared to the medical field for the mass media and public relations, and to evaluate the scientific merit of medical research relative to the pressures on scientists, doctors, researchers, companies and universities to garner media attention.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 675 Grant Writing for the Arts and Humanities 3.0 Credits

Students develop the skills needed to write an effective grant proposal. Topics include idea development, analyzing a team's capabilities to complete a project, developing a clear plan of attack, locating funding sources, honing research skills, and effectively using graphic elements in proposal design.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 680 Public Relations Writing and Strategies 3.0 Credits

An intensive, advanced public relations course covering public relations theory, strategies and writing. Students will apply theory and tactics in the development of crisis communication plans and issue management strategies.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 685 International Public Relations 3.0 Credits

This course is a comprehensive overview of international issues in PR including history and evolution of the field, image-formation and image-change processes, PR in war and conflict, effects of different political and legal systems on PR, actual PR practices in different countries and regions of the world.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 686 International Communication 3.0 Credits

This course is taught within the paradigm of media ecology. Such issues as the historical context, theoretical concepts, economic and structural aspects of international communication is considered. The effects of culture, language, religion, history, politics, and tradition on the process of international communication are also examined.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 687 International Negotiations 3.0 Credits

This course examines theoretical and practical elements of international negotiations. Students are taken into the work of diplomats, policymakers, and corporate leaders negotiating agreements and are guided through psychological, sociological, and political dimensions of the talks process. By the end of this course students will be able to analyze negotiations scientifically and professionally.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 690 Special Topics 3.0 Credits

Covers selected topics in technical and science communication. May be repeated for credit.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

COM 701 Contemporary Social Theory 3.0 Credits

This course is a graduate level introduction to social theory, familiarizing students with original works by the major theorists of the late 19th century to the present. Students will especially examine the production of social theory as an ongoing conversation about the predicaments of modernity and post-modernity.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 702 Communication Theory I 3.0 Credits

This course is an introduction to the study of persuasion and media effects. Readings include elements of persuasion and compliance seeking, as well as how persuasion takes effect through mass media. Course draws liberally from contemporary research in communication literature.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 703 Communication Theory II 3.0 Credits

Through readings of major theoretical ideas and voices, and occasional case examples, this course introduces students to theories of discourse and semiotics, including the role that language plays in social construction, discourse and post modernity, theories of the sign, structuralism and post-structuralism, pragmatics and language ideology.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 704 Research Methods in Communication 3.0 Credits

This course familiarizes students with various quantitative research methods in communication research including analysis, survey research and experiments. Each state of the research process will be explored from hypotheses to defining and operationalizing variables. To effective sampling, to analysis and write-up. Also introduces students to a wide range of original research studies.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 705 Data Analysis in Communication 3.0 Credits

Students are introduced to statistics for communication research, including quantitative analysis techniques for survey data and content analysis. Casual models, sampling and basic ideas of correlation and regression are discussed. Course is a hands-on approach with equal attention to technique and theoretical understanding, using SPSS software.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 710 Mass Communication and American Social Thought 3.0 Credits

Mass communication was at the center of most of the hopes and anxieties of the 20th Century. Would mass communication promote democracy or totalitarianism, support the powers-that-be or challenge them, make us more or less intelligent, enhance real life or distort it, etc.? In the end, what do we want mass communication to be and do in the 21st Century?.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 715 Media, Advocacy and Public Spaces 3.0 Credits

Half of the world's population lives in cities. With this increase, notions of public space, rights of access, land use and development become highly contested. Students will conduct their own ethnographic fieldwork in urban environments that address issues of conflict that take place in or engage with urban public spaces.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 720 Critical Theory 3.0 Credits

This course provides an overview of critical theory. It starts with the creation of the critical Frankfurt School, and reviews the works of Gramsci, Adorno, Horkheimer and Marcuse. It then focuses on the expansion of critical theory by Jurgen Habermas through consideration of his Theory of Communicative Action.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: COM 701 [Min Grade: C]

COM 725 Political Communication 3.0 Credits

This course introduces students to the background concepts and literature in multiple areas of political communication. Material ranges from rhetoric and public relations to mass communication theory. The course objective is to equip students with the skills so that they can go on to pursue scholarly research in these areas on their own. Among other things, students will learn how to write and analyze speeches; evaluate more and less adroit responses to questions; assess media coverage of political affairs.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 730 Politics of Life 3.0 Credits

In this course we 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, we 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 our discussion in class. This is a reading and discussion-intense course.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 731 Global Subjects of Biocapital 3.0 Credits

Students explore issues related to capitalism based on biotechnologies, the life sciences, medicine, agriculture and other related industries globally. Students consider specific cases of human trafficking, the global trade in human organs, global agribusiness and biotech, global clinical trials and medical tourism. The experiences of workers, farmers, research participants, and donors will be a central focal point. This is an intensive reading, writing and discussion course.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 735 Material Culture 3.0 Credits

Stuff. Things. Goods. Possessions. This course explores the relationship between human beings and the material objects that surround us. Drawing from literature in anthropology, archaeology, cultural studies, communications, and science and technology studies, we will be exploring the cultural and social life of things: how they move across borders and through our lives, how they accumulate and disperse, how they define the difference between social groups and classes, and, most of all, how they lend our lives weight and meaning. We will also be exploring the status of things in the digital age, emergent notions of materiality, and cutting edge work in "new materialism" studies.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 777 Social Network Analysis 3.0 Credits

This seminar introduces social network analysis to graduate students, emphasizing its theoretical, substantive, and methodological foundations.

The main objective of this course is to allow students to acquire a sufficient grasp of both the classical and the contemporary network literature to enable them pursue independent advanced study, and ultimately, to contribute original research results to their disciplines.

The course covers key network concepts and principles; examines data collection, measurement, and computer analysis techniques; and investigates applications in social sciences, communication, information science, public health, organizational studies, and related disciplines.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

COM 799 Independent Project in Technical and Science Communications 12.0 Credits

Provides advanced independent study in technical or science communication. May be repeated for credit.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

COM 801 Seminar in Contemporary Theory 3.0 Credits

This is a special topics seminar course that will introduce students to different currents in contemporary social theory, especially through in-depth reading and discussion of a single major theorist or theoretical school. Course may be repeated for credit.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 3 times for 9 credits

COM 802 Seminar in Discourse and Semiotics 3.0 Credits

This is a special topics seminar course that will explore in-depth a particular theoretical or research approach to the study of language and signs. Students will work with major theoretical approaches as well as research in the area. Course may be repeated for credit.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 3 times for 9 credits

COM 803 Seminar in Structural and Cultural Dynamics 3.0 Credits

Through in-depth exploration of a specific research topic, this seminar course will introduce students to what is called the sociological imagination. The course examines special topics that will illuminate such broad sociological approaches as political economy, cultural analysis, neo-institutionalism or post-modernism. Course may be repeated for credit.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 3 times for 9 credits

COM 804 Seminar in Research Methodology 3.0 Credits

This course focuses on a single research method. The course takes students through the inception of research ideas, research design, implementation and data-analysis/write up as the mean to understanding the limitations and possibilities of the research process according to methodology. Course paper involves student research design practicum. Course may be repeated for credit.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 3 times for 9 credits

COM 805 Seminar in Communication Ethics 3.0 Credits

By in-depth examination of a single issue in research ethics, this course develops student awareness of ethical issues in processes like peer review, human subjects research evaluation, and public consumption of knowledge generated by scholarly investigation. Course may be repeated for credit.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 3 times for 9 credits

COM 998 PHD Dissertation Research in Communications 1.0-12.0 Credit

Requires supervised research, including literature research, data collection, and writing of doctoral thesis.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Environmental Science

Master of Science Environmental Science (MSES): 45.0 quarter credits

Doctor of Philosophy: 90.0 quarter credits

About the Program

Environmental science is a multidisciplinary field in which we try to understand environmental problems and find solutions to them. This field requires understanding of a number of disciplines.

The program's areas of focus include: ecology, biodiversity, conservation, environmental assessment, and paleoecology-geology. A student may alternatively craft a specialized plan of study outside of these strength areas under the guidance of an academic advisor.

The master's degree may be completed with either a thesis or non-thesis option. Those choosing to prepare a thesis must complete 45.0 credits (up to 12.0 credits may be research). Students choosing the non-thesis option must complete coursework totaling 45.0 credits (6.0 of which may be research). Most courses carry three credits.

Part-time Study

The MS degree may be completed on a part-time basis. Most courses are scheduled in the late afternoon and evening, usually on a rotating basis from year to year. Part-time students should plan to take courses in the appropriate sequence to comply with the necessary prerequisites. Scheduling of course is dependent on student demand and faculty resources; however, most prescribed courses are offered at least once every other year (schedules are published each term). Required courses should be taken at the first opportunity.

Additional Information

For more information, visit the Department of Biodiversity, Earth & Environmental Science (<http://www.drexel.edu/bees>) website.

Susan Cole is the Graduate Coordinator for Environmental Science. Susan Cole can be reached by telephone at 215.895.2905 or e-mail at coless@drexel.edu.

Admission Requirements

In addition to the general entrance requirements for all applicants, entrance to the MS Program in Environmental Science requires a bachelor of science degree in science, mathematics, or engineering. Minimally, students must have completed a year each of calculus, general biology, general chemistry, physics, and, preferably, a semester of organic chemistry.

PhD Program

Applicants to the doctoral program are judged on the basis of academic excellence and the alignment of their research interests with those of the faculty in the department. Prospective PhD students are welcome to contact the program to discuss their research interests.

Additional information about how to apply is available on the Graduate Admissions at Drexel University (<http://www.drexel.edu/grad/programs/coas/environmental-science>) website.

Degree Requirements: MS in Environmental Science

The Master of Science in Environmental Science (MSES) program requires three core courses that form the basis for further specialization. Students choose to complete the remainder of the program with elective courses based on interest.

Core Courses

ENVS 501	Chemistry of the Environment	3.0
ENVS 506	Biostatistics	3.0
ENVS 511	Evolutionary Ecology	3.0
ENVS Electives		36.0
Total Credits		45.0

Elective Areas

Please see Course Descriptions for a list of Environmental Science (ENVS) electives. Students may also take Environmental Policy (ENVP) and Environmental Engineering (ENVE) courses with prerequisites. Other departmental courses with approval.

Degree Requirements: PhD in Environmental Science

The following general requirements must be satisfied in order to complete the PhD program in Environmental Science:

- 90.0 (post-bachelor's) or 45.0 (post-master's) quarter credits
- qualifying exam
- establishing a plan of study
- 3 core courses recommended, not required
- additional courses dependent on advisor or committee recommendations
- candidacy exam/approval of dissertation proposal
- dissertation/thesis
- defense of dissertation/thesis

- a graduate research seminar presentation once a year for second, third, and fourth-year students.

Thesis Advisor/Plan of Study

For students admitted without an identified Thesis Advisor, the Thesis Advisor must be selected by the end of Winter term in the first year. All students are asked to submit a Plan of Study (that has been agreed upon by Thesis Advisor and student) by the end of Winter term first year. It is anticipated that the graduate coursework will be completed during the first two years or less. Generally there is no prescribed coursework -- students must take courses needed to complete their research under guidance of an faculty advisor.

Curriculum

The following courses are *recommended*, but not required:

ENVS 501 Chemistry of the Environment
 ENVS 506 Biostatistics
 ENVS 511 Evolutionary Ecology

Candidacy Examination

The function of the Candidacy Examination is to test the breadth and the depth of the student's capabilities in their chosen area of study. The graduate student becomes a PhD *candidate* only after successfully completing the Candidacy Examination and completing 15 or 45 credits (for post-master's or post-bachelor's degree students, respectively). The candidacy exam is comprised of three parts whose order will be determined by the Candidacy Committee: written examination (or qualifying exam), dissertation research proposal, and oral examination.

Students entering the program with a master's degree are expected to complete the candidacy examination by the end of the summer quarter of their first year. Students entering the PhD program with a bachelor's degree are expected to complete this examination by the end of the summer quarter of their second year.

Thesis/Dissertation and Defense of Thesis/Dissertation

The student will finalize their dissertation only after approval to write is granted by the Dissertation Research Committee. Approval is based upon an evaluation of the breadth and depth of original research being conducted by the student. The dissertation must follow the format specifications set forth in the Drexel's Office of Research and Graduate Studies (<http://www.drexel.edu/graduatestudies>). Research conducted for the dissertation must be presented in a lecture open to the public and then defended, privately, before the student's Dissertation Research Committee.

Facilities

Facilities include fully equipped research laboratories in microbiology, ecology, hydrology, and chemistry. Field ecology research augments lab facilities with field-specific equipment, including two boats (14- and 25-foot) and vans with towing capacity. A full range of sampling equipment exists in the department from seine nets, sediment dredges and coring devices, water sampling bottles, flow meters and acoustic tracking devices. Some additional research facilities in environmental biotechnology, chemistry and atmospheric engineering are located in other locations on Drexel's campus.

Among the equipment available for student research are atomic absorption spectrophotometers, UV-visible spectrophotometers, gas-liquid chromatographs, ion chromatograph, ICP-Mass Spectrometer, GC-Mass Spectrometer, high performance liquid chromatographs, total organic carbon analyzer, elemental analyzer for carbon and nitrogen, stable isotope mass spectrometer, high-speed refrigerated centrifuge, nutrient analyzers, and UV photochemical reactor. In addition, the department and university have various microscopes including a scanning electron microscope (SEM). Within the department and in the Department of Biology there is a large capacity for genomics including preparatory equipment for DNA extraction and enhancement.

Drexel University is a national leader in the use of computers for educational and research functions. Several facilities on campus are available for student use.

Courses

ENVS 501 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

ENVS 506 Biostatistics 3.0 Credits

Covers measures of biostatistics, including central value and dispersion, sampling and distribution, statistical inference, analysis of variance, regression and correlation, and time series. Emphasizes application.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

ENVS 511 Evolutionary Ecology 3.0 Credits

Studies the basic principles of evolution and ecology, including natural selection, the ecological niche ecological succession, and the food web, and effects of human activities on ecosystems. Views humans as a species.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

ENVS 528 Conservation Biology 3.0 Credits

This course will detail the loss of biodiversity and explore related issues, including the theories and practices of conservation biology 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

ENVS 538 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

ENVS 564 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 (neutral 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

Corequisite: ENVS 565

ENVS 565 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 observations, analysis of data and written report. Graduate students supervise weekly assignment review sessions, organize peer review sessions and revise the laboratory manual.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Corequisite: ENVS 564

ENVS 575 Invertebrate Paleontology 4.0 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 adaptation are emphasized. The lab focuses on hands-on fossil identification.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

ENVS 577 Vertebrate Paleontology 3.0 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

ENVS 582 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 analyses. Non-vascular species are examined but not emphasized.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 1 times for 5 credits

Prerequisites: ENVR 511 [Min Grade: C] or ENVS 511 [Min Grade: C]

ENVS 583 Ecology of the New Jersey Pine Barrens 4.0 Credits

Course focuses on the ecology of the New Jersey Pine Barrens. Students learn field survey 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

Prerequisites: ENVS 511 [Min Grade: C] or ENVR 511 [Min Grade: C]

ENVS 588 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 25 foot Drexel research vessel, Peter Kilham.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: ENVS 511 [Min Grade: C] or ENVR 511 [Min Grade: C]

ENVS 601 Advanced Environmental Chemistry 3.0 Credits

Covers thermodynamic and kinetic principles and their application to the study of chemical changes and reactions in the water or air environments.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: ENVR 501 [Min Grade: C] or ENVS 501 [Min Grade: C]

ENVS 605 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

Prerequisites: ENVR 501 [Min Grade: C] or ENVS 501 [Min Grade: C]

ENVS 613 Advanced Population Ecology 3.0 Credits

One 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

ENVS 614 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

ENVS 624 Microbial Ecology 3.0 Credits

Studies the relationships of microbes with plants, animals, and the environment, both biotic and abiotic components. Examines the key role of microbes in the functioning of ecosystems affecting decomposition, disease, nutrient cycling, and energy flow. Studies these processes and the role of microbes in the natural functions of ecosystems.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: ENVR 516 [Min Grade: C] or ENVS 516 [Min Grade: C]

ENVS 626 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

ENVS 627 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

ENVS 630 Aquatic Ecology 3.0 Credits

Studies the relationship 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

ENVS 690 Marine Ecology 3.0 Credits

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

ENVS 692 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

ENVS 700 Evolution 3.0 Credits

Covers historical evidence for and principal mechanism of organic evolution, including the origin of life and new groups of organisms in the past and present, and the genetic basis for evolution. Discusses current research in evolutionary biology and ecology.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

ENVS 708 Environmental GIS 3.0 Credits

This introductory course is technically oriented and will provide a foundational understanding of GIS in an environmental context. Covers GIS principles and practices and applies spatial investigation procedures to analyze geographic data, including mapping and computer systems, attribute and spatial data models, data organization in GIS, GIS data analysis, and future trends for this technology.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

ENVS 710 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 budgets, toxins, and optimality theory.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

ENVS 711 Aquatic Toxicology 3.0 Credits

Applies the principles of toxicology to fish and aquatic invertebrates. Includes applications of laboratory and field tests to evaluate aquatic effects, and methods of data analysis.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

ENVS 712 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

ENVS 722 Tropical Ecology 3.0 Credits

Covers the ecology of tropical forests, including biogeography, history, current processes, and effects of economic developments of rain forest and dry forest of the Old and New World tropics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

ENVS 723 Tropical Field Studies 3.0 Credits

Ecology of tropical rain forests and dry forests. We will explore physical and biological factors that result in formation of these forests, effect of human impacts on these forests, effectiveness of management of these forests and the future of these forests in Costa Rica in the field.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: ENVS 722 [Min Grade: C] (Can be taken Concurrently)

ENVS 726 Environmental Assessment 3.0 Credits

Examines the National Environmental Act of 1969 and its implementation according to the regulations of the Council on Environmental Quality. Discusses air, water, noise, biological cultural, and socioeconomic impacts. Includes methods of impact analysis and means to compare alternative actions.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

ENVS 751 Stream Analysis and Pollution Control 3.0 Credits

Covers the ecological response of natural waters to organic and inorganic pollution. Includes mathematical models for the analysis of the water quality of lakes and streams.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: (ENVR 501 [Min Grade: C] or ENVS 501 [Min Grade: C]) and (ENVR 516 [Min Grade: C] or ENVS 516 [Min Grade: C])

ENVS 797 Research 20.0 Credits

Requires actual formulation and investigation of a research problem and a written report.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

ENVS 799 Independent Study 9.0 Credits

Provides independent study in environmental science.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

ENVS 864 Graduate Research Seminar 1.5 Credit

The BEES Graduate Research Seminar is a weekly series of scientific presentations by faculty, graduate students and outside speakers. The seminars are opportunities for learning about and discussing ongoing research in the Department and current issues in biodiversity, earth and environmental science.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

ENVS 865 Special Topics 9.0 Credits

Covers topics of current interest to faculty and students. Specific topics for each term are announced prior to registration. May be repeated for credit if topics vary.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

ENVS 891 Research Methods I 3.0 Credits

Introduces research methods and literature, procedures for the collection and analysis of data, and preparation of technical papers.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

ENVS 898 Master's Thesis 20.0 Credits

Master's thesis.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

ENVS 998 Ph.D. Dissertation 20.0 Credits

Requires each student working on a dissertation to file a written report each term with his or her supervisory committee and the program graduate advisor.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Joint JD/PhD Law-Psychology Program

Juris Doctor (JD) = 85.0 semester credits

Doctor of Philosophy (PhD) = 91.0 quarter credits

About the Program

The School of Law (<http://www.earlemacklaw.drexel.edu>) and the Department of Psychology (<http://www.drexel.edu/psychology>) in the College of Arts and Sciences offer a joint and integrated JD/PhD Program in Law and Psychology. The program melds two already ongoing successful endeavors, the JD degree in the School of Law and the PhD in clinical psychology in the Department of Psychology. See the JD-

PhD Program webpage (<http://www.drexel.edu/psychology/academics/graduate/jdphd>) for more information.

Students in the program complete all 85.0 semester credits required for graduation from the law school and all 91.0 quarter credits required to complete the doctorate. The program allows those students who wish to pursue professional degrees in both law and psychology a more efficient plan of study. The program is designed to be completed in seven (7) years, including required psychology practica, a year's internship in an American Psychological Association accredited predoctoral mental health/forensic setting, a master's thesis, a doctoral dissertation, and 20 hours per week of cooperative training and 50 hours of pro bono service in law.

Students who are accepted into the JD/PhD program will receive full tuition remission for all psychology coursework, plus a guaranteed annual stipend that is currently at least \$9,000 per year for all six years they are at the university prior to completing the clinical internship. Students with outstanding LSAT scores are eligible for full tuition remission from the School of Law.

For information on the Admissions process, visit the JD/PhD Application Instructions (<http://www.drexel.edu/psychology/academics/graduate/jdphd/application>) page.

Philosophy

The program bridges the gap between legal and psychological training. By and large, lawyers and social scientists come from different cultures, with different interests, different cognitive approaches to solving problems, different research methodologies, and different attitudes toward confrontation and argument. Each profession arrives at the "truth" in different ways, and its members are exposed to different styles of education during their post-baccalaureate training. Legal education develops an understanding of case analysis, statutory interpretation, the evolution of legal traditions, and methods for resolving disputes. Education in psychology develops research and clinical skills and understanding of behavioral theories, techniques, and statistical methods. Law, which has special rules concerning evidence and proof, relies heavily on precedent and the application of legal principles to specific facts toward the goal of settling conflicts that need immediate resolution. By contrast, psychology looks at problems through an empirical lens, using psychometrically-based tools and techniques to systematically evaluate questions, but rarely reaching a "final verdict." Because the limits of evidence and the meaning of "proof" in psychological research may differ sharply from the limits of evidence and proof in law, conflict may result when the two disciplines interact.

Goals

Within the broad framework of the program's philosophy, the JD/PhD Program in Law & Psychology has three specific goals:

- Develop scientist-practitioners who will produce legally sophisticated social science research to aid the legal system to make better empirically-based decisions;
- Produce lawyer-psychologists who will participate in the development of more empirically and theoretically sophisticated mental health policy by legislatures, administrative tribunals, and the courts; and
- Educate highly trained clinicians who can contribute to the advancement of forensic psychology in such areas as criminal law, domestic relations, and civil commitment.

In fulfilling these goals, the program trains students in an integrated and conceptually unified curriculum so they acquire a mature understanding of the interaction between the two disciplines.

Curriculum

Students attend the School of Law and the Department of Psychology simultaneously for six years, integrating course work in both disciplines each year. Students maintain continuous contact with the faculties of both schools and the developments in both disciplines over the course of each year.

In the seventh year, after obtaining the JD, students undertake a year-long supervised internship and complete their doctoral dissertation. They are awarded the PhD at the end of their seventh year.

Training consists of seven elements:

- The required existing core program in law and psychology at both schools;
- Interdisciplinary courses; e.g., Mental Health Law, Behavioral Sciences and the Law, Expert Witnesses, Law and the Mind Sciences;
- Supervised psycholegal research experience on teams of students' faculty mentors;
- Legal clinics and psychology practica and internships that combine knowledge from both fields in a practical setting;
- Electives in both fields, e.g., bioethics, education law, health law, health psychology, employment discrimination, neuropsychology;
- Cooperative experience and pro bono service in legal settings; and
- Employment for at least one summer in a legal setting, e.g., public interest law firm, governmental agency, private law firm, nonprofit association.

Master of Science in Environmental Policy

Master of Science Environmental Policy (MSEP): 45.0 quarter credits

About the Program

The Master of Science in Environmental Policy program provides a comprehensive, multi-disciplinary approach to the development, implementation, and evaluation of environmental policy. The program prepares students for careers as policy analysts who have a strong commitment to environmental values, are scientifically and methodologically competent, and can work effectively in the democracy policy process with the various groups and institutions engaged in environmental issues.

To meet these requirements, students must complete a range of coursework designed to teach:

- knowledge of how policies are developed and implemented
- scientific and engineering basis of effective environmental policies
- an understanding of who the key players are in environmental politics, and how to work with them to accomplish environmental improvements.

For more information about this program, visit the College's MS in Environmental Policy (<http://drexel.edu/sts/academics/msEnviroPolicy>) page, or contact:

Kelly Joyce, PhD
 MacAlister Hall, Room 3025
 215.571.4449
 kaj68@drexel.edu

Admission Requirements

In addition to the general entrance requirements for all applicants, entrance to the MS Program in Environmental Policy requires a bachelor's degree in environmental science, or in the natural, physical, or social sciences, or related engineering disciplines. Students entering from other programs at Drexel University or other institutions may be required to complete additional course work to meet the course prerequisites for the required courses.

For additional information on how to apply, visit Drexel's Admissions page for Environmental Policy (<http://www.drexel.edu/grad/programs/coas/environmental-policy>).

Degree Requirements

Core Courses *

ENVS 501	Chemistry of the Environment	3.0
ENVS 506	Biostatistics	3.0
ENVS 511	Evolutionary Ecology	3.0

Required Specialization Courses in Environmental Policy

ENVP 522	Environmental Law	3.0
ENVP 523	Environmental Regulations	3.0
ENVP 650	Resource & Environmental Economics	3.0
ENVP 720	Environmental Cost-Benefit Analysis	3.0
ENVP 760	Social Change & Environment	3.0
ENVP 774	Environmental Policy Economic Analysis	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

Environmental Policy Electives

Recommended Courses:		
ENVP 865	Special Topics	
ENVP 880	Environment and Society	
SCTS 570	Environmental Policy	

Total Credits **45.0**

* Within the first quarter of study, a student must meet with an assigned advisor and work out a plan of study.

Courses

ENVP 522 Environmental Law 3.0 Credits

Examines administrative law applicable to the management of environmental programs, including constitutional constraints on the responsibilities of administrators and major court decisions on environmental issues. Covers due process, inspection, citizen actions, evidence and other matters.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: (ENVR 501 [Min Grade: C] or ENVS 501 [Min Grade: C]) and (ENVR 511 [Min Grade: C] or ENVS 511 [Min Grade: C] or ENVR 521 [Min Grade: C] or ENVS 521 [Min Grade: C])

ENVP 523 Environmental Regulations 3.0 Credits

Reviews the development and implementation of environmental regulations. Acquaints students with the federal regulatory process. Focuses on the process of regulation proposal and examines the intent and coverage of the major environmental regulations, with emphasis on Section 40 of the Code of Federal Regulations.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: (ENVR 501 [Min Grade: C] or ENVS 501 [Min Grade: C]) and (ENVR 511 [Min Grade: C] or ENVS 511 [Min Grade: C] or ENVR 521 [Min Grade: C] or ENVS 521 [Min Grade: C])

ENVP 650 Resource & Environmental Economics 3.0 Credits

This course is an introduction to the application of economics to resource and environmental issues. The course highlights the theoretical foundations for resolving complications due to the unique features of natural resources and the environment. We use empirical issues in the broad area of resource and environmental economics to illustrate these concepts.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

ENVP 720 Environmental Cost-Benefit Analysis 3.0 Credits

This course deals with cost-benefit analysis in the environmental content. We examine the theoretical basis for welfare measurement and then proceed to examine various methods for monetary valuation of environmental goods, with an emphasis on empirical implementation.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: ENVP 650 [Min Grade: C]

ENVP 760 Social Change & Environment 3.0 Credits

Introduces the processes of social change and the key collective actors and institutions involved in the creation of U.S. environmental policies. Provides an understanding of the historical and social processes by which environmental policy is created and changed through a political process among a number of different coalitions.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

ENVP 774 Environmental Policy Economic Analysis 3.0 Credits

This course presents theories and applications in the design of economic instruments for controlling environmental problems. We also examine briefly economy-wide factors driving how firms and households react to these policies.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: ENVR 650 [Min Grade: C]

ENVP 865 Special Topics 0.5-5.0 Credits

Covers topics of current interests to faculty and students; specific topics for each term will be announced prior to registration. May be repeated for credit if topics vary.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

ENVP 870 Human Dimensions of Global Climate Change 3.0 Credits

This course examines the human dimensions of global climate change. It focuses on three questions: 1) What are the social factors driving CO₂ emissions? 2) What are the major impacts that climate change will have on human society, and 3) How can society mitigate or adapt to a changing climate?.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

ENVP 875 Environmental Justice 3.0 Credits

Seminar course focusing on the concept of environmental justice/injustice; empirical evidence of inequalities; theories of environmental injustice; politics of environmental health and illness; legal remedies at local and international level; and the environmental justice movement.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

ENVP 880 Environment and Society 3.0 Credits

Examines the relationships among human society, including economic and political institutions, cultural beliefs, and individual behaviors, and the natural environment. Examines, through a historical perspective, the role that social organizations play in either fostering an ecologically sustainable society or in accelerating ecological destruction.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Master of Science in Public Policy

Master of Science: 45.0 quarter credits

About the Program

The Master of Science in Public Policy program is a general professional masters degree designed for people who work, or who would like to work, for government or a nonprofit organization.

The program has a required core curriculum of nine courses, specifically designed for students to:

- develop an understanding of the social, political and ethical context of policy research, and how this understanding can be applied to an applied practice of policy analysis;
- conceptualize, design and conduct social research for policy purposes, as well as comprehensively analyze existing social research data;
- recognize the history of public policy institutions in America and the management and governance of nonprofit organizations; and
- understand the concept of sustainability as it relates to policy planning, design, and implementation.

In addition to the core courses, the program has a focus on case study research as a unifying element of the curriculum. The curriculum reinforces coursework with a series of accompanying 1-credit, online, Case Study Research co-requisites. Students are required to choose a specific case study topic that they will work on for the duration of the core curriculum. In each subsequent Case Study Research course, students continue further research and writing on their chosen case study topic. Thus by the end of the program students will have produced a polished, in-depth analysis of a specific case that they can use to demonstrate expertise in a given policy area.

With the approval and support of the program director, students can craft a specialized course of study with their three electives, or they can take courses in one of three tracks:

- Educational Policy
- Environmental Policy
- Urban Systems Management

The degree can be completed part-time in two years. Select students will also be able to apply for an intensive full-time track in which they complete the degree in a single year.

For additional information, view the Center for Public Policy (<http://www.drexel.edu/publicpolicy>) page on the College of Arts and Sciences' website.

Admission Requirements

Acceptance for graduate study at Drexel University requires a four-year bachelor's degree from an accredited institution in the United States or an equivalent international institution. Although admission requirements vary by program, regular acceptance typically requires a minimum grade point average (GPA) of 3.0 for the last two years of undergraduate work. The GPA for any graduate work must be at least 3.0.

The admission committee evaluates all credentials submitted by applicants to determine a student's ability and potential to succeed in graduate study. In addition, the committee is interested in the applicant's ability to contribute to his/her program of study and to the University community as a whole.

Though part-time at 8.0 credits, Drexel is extending the same scholarship opportunities to Master of Science in Public Policy students who enroll that are usually only available for full-time programs.

Visit the Graduate Admissions (<http://www.drexel.edu/grad/programs/coas>) website for more information about requirements and deadlines, as well as instructions for applying online.

Degree Requirements

Required Courses

BUSN 502	Essentials of Economics	3.0
ECON 616	Public Finance and Cost Benefit Analysis	3.0
COM 705	Data Analysis in Communication	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
PLCY 509	Sustainability & Public Policy	3.0

Case Study Courses

9.0

The curriculum reinforces coursework with a series of accompanying 1-credit, online, Case Study Research courses. In the first, students are introduced to case study methodology and practice, and required to choose a specific case that they will work on for the duration of the core curriculum. In each subsequent Case Study Research course, students continue further research and writing on their chosen case study topic. Thus by the end of the program students have produced a polished, in-depth analysis of a specific case that they can use to demonstrate expertise in a given policy area.

PLCY 511	Case Study Literature Review	1.0
PLCY 512	Case Study Document Review	1.0
PLCY 513	Case Study Interviews	1.0
PLCY 515	Case Study Colloquium	1.0
PLCY 516	Case Study Research II (1-credit course taken 3 times)	3.0
PLCY 517	Case Study Final Project	1.0
Elective Courses		
Elective courses are taught under the PLCY 590: Special Topics in Public Policy, or by one of the participating departments.		
PLCY 590	Special Topics in Public Policy	
Total Credits		44.0

Courses

PLCY 503 Theory and Practice of Policy Analysis 3.0 Credits

The aim of this course is to develop an understanding of the social, political, and ethical context of policy research, and how this understanding can be translated into an applied practice of policy analysis.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PLCY 504 Methods of Policy Analysis 3.0 Credits

Course focuses on the logic and procedures used in carrying out social research for policy purposes. The aim of the course is to develop the student's capacity to conceptualize, design, and conduct research.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PLCY 506 Institutional Dynamics of the Policy Process 3.0 Credits

Introduces students to the American policy process, looked at through the lens of historical institutional analysis.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PLCY 507 Nonprofit Organizations 3.0 Credits

This course focuses on distinctive features of managing and governing nonprofit organizations and draws on current theories, concepts, and real world examples to explore particular management challenges. Course includes a mix of lecture, discussion, case applications, and presentations by practitioners from the local nonprofit community.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PLCY 509 Sustainability & Public Policy 3.0 Credits

Course introduces students to the concept of sustainability as it relates to policy planning, design, and implementation, and examines how different definitions of sustainability (e.g. environmental, economic, and social) can be translated into best practices, performance benchmarks, and other metrics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PLCY 511 Case Study Literature Review 1.0 Credit

A tutorial course for public policy students to review and report on academic literature relevant to their chosen case study topics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: PLCY 504 [Min Grade: C]

PLCY 512 Case Study Document Review 1.0 Credit

A tutorial course for public policy students, to collect and report on original documents (legislation, hearing transcripts, reports, etc.) relevant to their chosen case study topics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: PLCY 504 [Min Grade: C]

PLCY 513 Case Study Interviews 1.0 Credit

A tutorial course for public policy students to interview personnel relevant to their chosen case study topics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: PLCY 504 [Min Grade: C]

PLCY 514 Case Study Research I 1.0 Credit

A tutorial course for public policy students to engage in literature reviews and/or original research relevant to their chosen case study topics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: PLCY 504 [Min Grade: C]

PLCY 515 Case Study Colloquium 1.0 Credit

A group discussion course for public policy students to consolidate and report on their case study research and to comment on the research of other students.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: PLCY 504 [Min Grade: C] and PLCY 511 [Min Grade: C] and PLCY 512 [Min Grade: C] and PLCY 513 [Min Grade: C]

PLCY 516 Case Study Research II 1.0 Credit

A tutorial course for public policy students to collect and report on original documents (legislation, hearing transcripts, reports, ect) relevant to their chosen case study topics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: PLCY 504 [Min Grade: C] and PLCY 515 [Min Grade: C]

PLCY 517 Case Study Final Project 1.0 Credit

A final tutorial course for public policy students writing their case studies. Students complete and submit their final case study reports. Passage of this course is contingent completing an oral defense of their case studies.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: PLCY 504 [Min Grade: C] and PLCY 515 [Min Grade: C]

PLCY 590 Special Topics in Public Policy 0.5-12.0 Credits

Course covers on a rotating basis a variety of topics of interest to students in public policy, including (though not limited to) urban policy, environmental policy, and technology.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Master of Science in Publication Management

Master of Science: 45.0 quarter credits

About the Program

Drexel's MS Degree in Publication Management prepares students for careers in the dynamic and multi-disciplinary field of publishing and includes course content in books, periodicals, e-publishing, marketing, editorial, writing, acquisitions, page design, and projections and budgeting. The program includes education in professional and scholarly, trade, and consumer publishing. Students are taught by well-known industry professionals and accomplished professors. The curriculum includes completion of an independent project focusing upon an area of publishing in which a student is most interested. Independent projects can be done in conjunction with one of the several publishers and publishing companies with which the program is affiliated. The goal of the program is to produce well-informed, skilled publishing professionals with a view to facilitate a productive career in publishing or a publishing related field or with a view to enhance a career that is already underway.

Students completing the program may find career opportunities in recognized publishing companies, publishing divisions of organizations or corporations, entrepreneurial endeavors, or independent or freelance settings. Past students have found positions in a broad range of business and educational settings.

Students come to the program from outside or inside of the publishing industry and from diverse undergraduate backgrounds including liberal arts, business, journalism, communications, science, and information studies. The program builds upon the individual's undergraduate content base by providing study of necessary publishing fundamentals and advanced publishing processes, research and scenarios. The program also serves the needs of individuals already employed in the publishing field who seek to update and broaden their knowledge and/or aspire to advance in their field.

All courses in the program are offered in the evening on a part-time or full-time basis. The curriculum is comprised primarily of courses offered through the College of Arts and Sciences, Department of Culture and Communications, and may include business courses offered through the LeBow College of Business. Students may choose from a variety of electives to heighten their academic experience. The MS Degree requires 45.0 credits for completion.

For more information, please contact:

Kathleen Volk Miller

Program Director
MacAlister 5037
kvm@drexel.edu
215.895.1303

Mary Beth Beyer

Department Administrator
MacAlister 5045
215.895.6911

Admission/Financial Aid Requirements for Admission

After admissibility to Drexel graduate studies has been determined, applicants are selected on the basis of college transcripts, a written statement of professional goals and objectives, references, and a personal interview with the graduate advisor.

For additional information on how to apply, visit Drexel's Admissions page for Publication Management (<http://www.drexel.edu/grad/programs/coas/publication-management>).

Financial Assistance

Graduate assistantships are available to selected students. Assistantships provide professional experience, tuition waiver, and stipend. Contact the University Financial Aid Office for information regarding work-study arrangements and student loans.

Degree Requirements

Required Courses

COM 510	Technical Writing	3.0
COM 570	Technical and Science Editing	3.0
PMGT 630	The Publishing Environment	3.0
PMGT 631	Page Design and Production	3.0
PMGT 635	Periodicals Publishing	3.0
PMGT 730	Book Publishing	3.0
PMGT 745	Electronic Publishing	3.0
PMGT 735	Publication Budgeting & Estimating	3.0
PMGT 740	Publications Marketing	3.0
PMGT 800	Independent Study	3.0
or PMGT 801	Independent Project	

Elective Courses *

Select five of the following, one must be a COM elective:	15.0
COM 500	Reading & Res Communication
COM 520	Science Writing
COM 530	Techniques and Science of Photography
COM 540	Technical and Science Graphics
COM 610	Theories of Communication and Persuasion
COM 620	Message Design and Evaluation
COM 630	Software Documentation
COM 640	Desktop Publishing
COM 650	Telecommunications Policy in the Information Age
COM 655	Ethnography of Communication
COM 660	Investigative Journalism
COM 665	Journalists, Courts and the Law
COM 670	Medical Writing
COM 675	Grant Writing for the Arts and Humanities
COM 680	Public Relations Writing and Strategies
COM 690	Special Topics
ORGB 625	Leadership and Professional Development
MKTG 601	Marketing Strategy & Planning
MKTG 630	Global Marketing

Total Credits

45.0

* Electives may include, but are not limited to the following.

Courses

PMGT 630 The Publishing Environment 3.0 Credits

Provides an overview of publishing from inception to current time. Covers publishing fundamentals (creation to print), describes publishing formats and genres, and begins development of networking contacts. Discusses future trends and employment opportunities.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PMGT 631 Page Design and Production 3.0 Credits

Analyzes methods of production and make-ready for digital and offset printing. Includes art, halftones, and line art. Includes hands-on experience in book and magazine page design and production.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PMGT 635 Periodicals Publishing 3.0 Credits

Provides the student with a thorough understanding of periodical publishing and the current environment. Students learn how to publish a successful periodical from launch to sales and distribution. Strategy and implementation are stressed. Current publishing methods are emphasized and students gain directly applicable experience.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PMGT 730 Book Publishing 3.0 Credits

Analyzes managerial decisions including acquisitions, design and development, marketing, financial, and copyright implications of books publishing. Includes books of all genres: fiction, non-fiction, scientific, children's and others.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PMGT 731 Computer Image Generation and Telecommunications 3.0 Credits

Surveys computer applications in the field of publishing, including text and graphic image creation and manipulation, data management, fundamentals of telecommunications and data, electronic page makeup, and CD-ROM and Web publishing.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PMGT 735 Publication Budgeting & Estimating 3.0 Credits

Analyzes the interrelationship between budgeting, estimating, acquisitions, and marketing; approaches and methods for product estimating; approaches to decision-making for service subcontracting; and the implications of service subcontracting decisions on budgeting, estimating, and marketing.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PMGT 740 Publications Marketing 3.0 Credits

Analyzes and provides case studies and examples of marketing methods specifically related to publishing books, periodicals, and electronic products. Includes print and online campaigns and strategies. Reviews state-of-the-art approaches.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PMGT 745 Electronic Publishing 3.0 Credits

Electronic Publishing gives students applied and theoretical knowledge of professional electronic publishing. Students will focus on issues relating to writing and integrating text and graphics to create websites and on-line publications. Students will also consider how issues in document design and usability analysis can be used to evaluate websites.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PMGT 799 Special Topics 3.0 Credits

Covers special advanced topics in publication management. May be repeated for credit if topic varies.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

PMGT 800 Independent Study 9.0 Credits

Involves individual investigation in special areas of publishing not regularly covered in the courses offered. Topics for study must be approved in advance of registration by the graduate adviser and the instructor involved. May be repeated for credit if topic varies.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

PMGT 801 Independent Project 0.5-9.0 Credits

Requires a project related to the printing and publishing industries to be designed, under faculty advisement, to meet individual student interests and career goals. Credits in excess of 2 may satisfy elective requirements.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Master of Science in Science, Technology, and Society

Master of Science: 45.0 quarter credits

About the Program

The Science, Technology, and Society (STS) program investigates the co-production of science and society; this is, the many ways cultural, economic, historical, and political contexts influence science, technology and medicine, and how science, technology and medicine influence these contexts. Questioning the taken-for-granted, students hone their skills in humanities and social science research methods to examine the interactions among science, technology, identities, relationships, and how these are rooted in larger structural relationships. Through this program, graduate students explore the impact of new technologies and scientific knowledge, as well as their many social, ethical and legal implications. The program also provides a unique international orientation, which recognizes the crucial context of globalization in the advancement of science and technology and the broad implications of scientific research and innovation in the politics and history of the contemporary world.

The STS program takes on some of our most important questions in contemporary science, technology and medicine with a multidisciplinary toolkit. 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, strong research methods expertise, and clear writing and presentation skills. The STS program emphasizes three interrelated areas: environment and sustainability; health and medicine;

and information, identities and networks. Working with a primary adviser, graduate students develop an individualized plan of study that allows them to pursue their interests in depth.

Prospective students for the MS in STS see this educational opportunity as an essential factor in their skill enhancement 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.

For additional information, visit the Master's Program in Science, Technology, and Society (<http://drexel.edu/sts/academics/ms-STS>) web page.

Admission Requirements

Applicants to the program must meet the general requirements for admission to graduate studies at Drexel.

Prospective students must also submit a 500-word essay explaining why they want to enter the program. These statements are read carefully by the faculty screening committee to evaluate each applicant's sense of purpose. Entering students typically begin during the fall quarter.

Visit the Graduate Admissions (<http://www.drexel.edu/grad/programs/coas/science-technology-society>) website for more information about requirements and deadlines, as well as instructions for applying online.

Degree Requirements

The program requires 45.0 credits of coursework which must be in the Department of Science, Technology and Society. Required courses total 27.0 credits (including a 3-credit research seminar, a 3-credit practicum, and 6 credits of research and writing for the thesis, which may be tied to the practicum). Remaining credits are chosen from a list of 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
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Select two of the following:

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	
PBHL 824	Public Health Ethics	

Science and Technology Policy	3.0
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Select one of the following:

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	
COM 650	Telecommunications Policy in the Information Age	
PLCY 509	Sustainability & Public Policy	
INFO 725	Information Policy	
Science, Technology & Society Lab		3.0

Select one of the following:

SCTS 703	Connected Mobility Lab	
SCTS 705	Identity and Intersectionality	
SCTS 710	Special Topics in Science, Technology and Society Lab	

Thesis and Electives * 21.0

SCTS 798	Master's Thesis	
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Suggested Electives **

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 790	Special Topics in Science, Technology & Society	
SCTS 799	Independent Study in Science, Technology and Society	
COM 690	Special Topics	
COM 701	Contemporary Social Theory	
COM 704	Research Methods in Communication	
COM 705	Data Analysis in Communication	
COM 720	Critical Theory	
COM 801	Seminar in Contemporary Theory	
MGMT 602	Managing Technology Innovation	
PBHL 516	Introduction to Public Health	
PLCY 504	Methods of Policy Analysis	
PSY 612	Psychology of Human-Computer Interaction Design	
PSY 712	History and Systems	

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 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.

Courses

SCTS 501 Introduction to Science, Technology and Society 3.0 Credits

This seminar introduces students to the study of science, technology, and society. Students will investigate different approaches to the study of STS, including methods of problem selection and research questions.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 502 Research Methods 3.0 Credits

This graduate seminar will provide an in-depth exploration of many of the research methods used by science and technology studies [STS] scholars. Participants will learn how to define a meaningful research question and to identify which methods will best answer that question. They will also learn how to design interview guides and conduct interviews, surveys, focus groups, fieldwork, content analysis, experiments and archival research. Strategies for analyzing data will also be addressed. A thorough understanding of research design and methodologies is crucial to the STS toolkit.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 503 Advanced Research Methods 3.0 Credits

This course focuses on a single social scientific research method. The course takes students through the inception of research ideas, research design, implementation and data-analysis in order to understand the limitations and possibilities of the research process according to methodology. The method focused on will vary according to instructor. Course may be repeated for credit.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 504 Science, Technology & Society Theories 3.0 Credits

This course is designed to provide participants with a rigorous introduction to important social theories used in the study of science, technology and society. In this course, we will read work by classical and contemporary theorists, exploring a variety of explanations and critiques of contemporary social life. Wrestling with these ideas will allow students to experience the diversity and richness of social theory and to explore how theory allows us to see topics in new, unique ways.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 570 Environmental Policy 3.0 Credits

This interdisciplinary seminar investigates how interests and ideas interact in environmental policymaking. Students will explore how conceptual and political innovations play out across several environmental issues, including wildlife management, energy development, and the regulation of environmental risks.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 571 Science and Technology Policy 3.0 Credits

This graduate seminar examines the relationship between science and technology policy and democracy. Students will tackle basic questions about the degree to which science and technology policies have advanced or compromised core goals of a democratic society, including economic prosperity, public health, environmental justice, and political equality more generally.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 584 Historiography of Science 3.0 Credits

This course is an introduction to the advanced study of the history of science and will explore major themes, debates, and theoretical approaches in the discipline.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 600 Contemporary Feminist Theory 3.0 Credits

This course surveys contemporary feminist theory with an emphasis on "new materialist" approaches to sex and sexual difference. An umbrella term, new materialism refers to a variety of recent attempts to re-imagine nature, sex, body, and matter. During the "linguistic turn" of the 20th century, many postmodern feminists retreated from these materials and their associated sciences; enamored of texts but allergic to bodies, postmodern feminists tended to embrace radical constructivism and reject scientific methods and knowledges. Today, new materialists return to biology, nature, sex, body, and matter in order to move beyond the logics of essentialism and somatophobia. This course will survey the results of this return with a special emphasis on understandings of sex and sexual difference.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 610 Material Culture 3.0 Credits

This course explores the relationship between human beings and material objects. Drawing from literature in anthropology, archaeology, cultural studies, and science and technology studies, we will explore the cultural and social life of things: how they move across borders, accumulate and disperse, and lend our lives weight and meaning.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 612 Medical and Healthcare Ethics 3.0 Credits

This course will introduce students to a range of topics including the role of explanatory narratives and patient experience in healthcare, the ethics of the design and conduct of clinical trials, the evolution of diagnostic categories, and the problem of healthcare access both in the US and in a global context.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 614 Technology, Progress, and Determinism 3.0 Credits

In this course, students will examine multi-disciplinary approaches to the meaning of technology. Students will focus on two major themes in the history of technology: progress and technological determinism. Students will examine the historical context of contemporary technologies as well as criticism of technology and industrialization.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 615 The Biopolitics of Health 3.0 Credits

This course explores theories of biopolitics and its application to ethical debates in health and medicine. Biopolitics is a powerful lens for examining how modern societies shape and define life itself.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 620 Medicine, Technology and Science 3.0 Credits

This graduate seminar focuses on the social dimensions of medicine, health and illness. Students will explore how definitions and experiences of health and illness are shaped by technology use, cultural contexts, institutional practices, health care policies, and inequalities. Students 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 social dimensions of the experience of health and illness.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 639 Politics of Life 3.0 Credits

In this course students 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, we 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 our discussion in class. This is a reading and discussion-intense course.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 640 STS Perspectives on Risk and Disaster 3.0 Credits

This course introduces students to critical debates and methods of analysis in science, technology, and society (STS) through the consideration of the modern history of global risk and disaster.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 641 Risk and Disaster Policy 3.0 Credits

This course introduces students to critical debates and methods of analysis in science, technology, and society (STS) through the consideration of public policy formation around global risk and disaster concerns.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 643 Contemporary Stem Workforces: Organizations of Labor in Lab, Shop and Clinic 3.0 Credits

In response to a growing national concern with STEM workforce development, this class critically analyzes scientific and technical labor and management practices in factories, laboratories, and clinics, and the social implications of STEM training and education. US and global cases are explored through the study of primary documents, artifacts, and the spaces of STEM work.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 645 War and Technoscience 3.0 Credits

Students will examine technology in the context of warfare and military institutions. Students will study major questions in the history of military technology, including the Revolution in Military Affairs, arms races and technological determinism. Students will also examine the technological relationships between military institutions and the broader societies in which they are embedded.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 650 Global Subjects of Biocapital 3.0 Credits

Students explore issues related to capitalism based on biotechnologies, the life sciences, medicine, agriculture and other related industries globally. Students consider specific cases of human trafficking, the global trade in human organs, global agribusiness and biotech, global clinical trials and medical tourism. The experiences of workers, farmers, research participants, and donors will be a central focal point. This is an intensive reading, writing and discussion course.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 651 Transnational Science & Technology 3.0 Credits

This course will explore the importance of considering the "transnational" in understanding the historical role of science and technology in the making of the modern world.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 660 Theoretical and Sociological Aspects of Measurement 3.0 Credits

This course familiarizes students with theoretical and sociological issues related to measurement by focusing on topics at the crossroads of the history and philosophy of science and technology such as the notion of theory, the nature and epistemology of experiments, and related themes of instrumentation, measurement and coordination.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 665 Advanced Topics in Philosophy of Science 3.0 Credits

This course studies advanced topics in the philosophy of science such as confirmation theory and theory choice, rationality and objectivity, scientific realism, laws of nature, scientific models and representation, explanation, reduction, computer simulations and climate change.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 697 Internship in Science, Technology and Society 0.5-3.0 Credits

Internships provide opportunities for students to clarify career interests; synthesize prior academic knowledge with direct experience; and sharpen critical thinking, analytical, and observational skills. Learning from and networking with professionals in the field is enhanced. This course requires formulation and investigation of a research problem and a written paper.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 703 Connected Mobility Lab 3.0 Credits

This course will address the large-scale transitions toward “sustainable” and “smart” technologies in transportation systems with an emphasis on how new information and communication technologies are transforming or disrupting the transport sector. Unlike other courses, it will do so through an innovative problem-based, hands-on, interdisciplinary “lab” experience in which students collaborate with others to work on “real-world” problems and solutions.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 705 Identity and Intersectionality 3.0 Credits

The practices of modern science, technology and medicine are deeply raced and gendered. This class moves beyond studies of singular social categories to explore intersections among individuals’ identities (race, class, gender, sexuality, [dis]ability, age, etc.) through critical reading of primary and secondary sources undertaken in a social-science “laboratory” setting.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 710 Special Topics in Science, Technology and Society Lab 3.0 Credits

In this course, students, faculty and community members team up in a hands-on, immersive social science laboratory setting to address contemporary social issues. Course covers on a rotating basis a variety of topics related to science, technology and society.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 790 Special Topics in Science, Technology & Society 3.0 Credits

Course covers on a rotating basis a variety of topics related to science, technology and society, including (though not limited to) environmental issues, the social dimensions of health and medicine, and the ethical, cultural and political dimensions of new technologies and scientific practices. May be repeated for credit when topics vary. Course content will vary so syllabus will be designed based on topic related to science, technology and society.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

SCTS 798 Master's Thesis 0.5-9.0 Credits

Independent research supervised by an STS faculty member toward completion of a required Master's Thesis.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

SCTS 799 Independent Study in Science, Technology and Society 0.5-3.0 Credits

Independent research supervised by a faculty member on a topic related to science, technology and society. May be repeated for credit.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 3 times for 12 credits

Mathematics

Master of Science: 45.0 quarter credits

Doctor of Philosophy: 90.0 quarter credits

About the Program

The Department of Mathematics is a broadly based academic unit offering instructional programs and carrying on research activities in mathematics. Doctor of Philosophy and Master of Science degrees are offered.

Areas of research specialty among the faculty include applied mathematics, algebraic combinatorics, biomathematics, discrete mathematics, optics, analysis, number theory, numerical analysis, probability and statistics, matrix and operator theory, fluid mechanics, and partial differential equations.

Additional Information

For more information about these graduate programs, visit Drexel University's Mathematics (<http://www.drexel.edu/math>) webpage.

Admission Requirements

Applicants should hold a BS degree in mathematics or the equivalent and meet the University's graduate admission standards. In particular, the student should have had intensive exposure to proof oriented courses, such as real analysis and abstract algebra. Students requesting financial aid are required to take the Graduate Record Examination General Test. Because many of the core courses are two- or three-term sequences beginning in the fall, new students are typically admitted to the programs only in the fall term. Admissions standards for the MS and PhD programs are equivalent.

For additional information on how to apply, visit Drexel University's Graduate Admissions (<http://www.drexel.edu/grad/programs/coas/mathematics>) website.

Master of Science in Mathematics

Students must complete a minimum of 45.0 graduate credits for the MS degree. Of these 15 courses, the following six are required:

Required Courses

MATH 504	Linear Algebra & Matrix Analysis	3.0
MATH 505	Principles of Analysis I	3.0
MATH 506	Principles of Analysis II	3.0
MATH 533	Abstract Algebra I	3.0
MATH 630	Complex Variables I	3.0
MATH 633	Real Variables I	3.0

The remaining 9 courses may be any graduate mathematics courses. In some cases, course substitutions may be made with courses from other departments. Elective courses taken outside the department must receive prior departmental approval in order to be counted toward the degree.

There are no thesis, language, or special examination requirements for the master's degree.

Students seeking a dual MS must satisfy core requirements for both degree programs.

Students should note that some departmental courses, such as Advanced Engineering Mathematics, are foundation courses and do not contribute to the departmental requirements for the degree. They do count toward the University requirements for a degree.

PhD in Mathematics

Students must complete a minimum of 45 graduate credits for the PhD degree, in addition to the 45.0 required by the MS program for a total of 90.0 credits. Of the 45.0 credits of MS program courses, the following six are required:

Required Courses

MATH 504	Linear Algebra & Matrix Analysis	3.0
MATH 505	Principles of Analysis I	3.0
MATH 506	Principles of Analysis II	3.0
MATH 533	Abstract Algebra I	3.0
MATH 630	Complex Variables I	3.0
MATH 633	Real Variables I	3.0

The remaining 27.0 credits, comprising the MS segment of the PhD program, may be any graduate mathematics courses. In some cases, course substitutions may be made with courses from other departments. Elective courses taken outside the department must receive prior departmental approval in order to be counted toward the degree.

The student must pass a written qualifying exam. The student is allowed two attempts. Students must take exam at the end of their first year, and have a second opportunity in September of their second year.

Students must take a PhD candidacy exam at the end of their second year. Additional coursework to reach the 90.0 credits required for the PhD will be agreed upon with the student's Graduate Advisor. Students should note that some departmental courses, such as MATH 544 (<https://nextcatalog.drexel.edu/graduate/collegeofartsandsciences/mathematics>) Advanced Engineering Mathematics, are foundation courses and do not contribute to the departmental requirements for the degree. They do count toward the University requirements for a degree.

Facilities

Department computers are accessible from residence halls over the campus network, and from off-campus via modem or an Internet Service Provider (ISP). Departmental and university networks provide access to the Internet and the Pennsylvania Education Network (PrepNet). Departmental research computers have a connection to the campus backbone at 100 Mbps and are also on the vBNS via a campus OCS ATM connection.

The computing resources of the Mathematics Department include:

- Math Resource Center (Korman 247): 6 Dell Optiplex (Core 2 Duo 2.8 Ghz, 3 GB RAM) running Windows XP Professional SP3.
- Faculty Center (Korman 207): 2 Lenovo ThinkCentre (Pentium 4 3.0 Ghz, 1 GB RAM) running Windows XP Professional SP3.
- Computer Server: One Penguin Server (Dual 2.2. GHz Opteron, 8 GB RAM) running Ubuntu Linux.
- File/Print/Mail/Web Server: 2 Penguin Servers (Dual 2.8 GHz Zeon, 1 GB RAM) running Ubuntu Linux and connected to 600GB RAID 5 Disk over a fully switched gigabit Ethernet network, 2TB mirrored RAID.

Courses

MATH 504 Linear Algebra & Matrix Analysis 3.0 Credits

Course topics include the QR decomposition, Schur's triangularization theorem, the spectral decomposition for normal matrices, the Jordan canonical form, the Courant-Fisher theorem, singular value and polar decompositions, the Gersgorin disc theorem, the Perron-Frobenius theorem, and other current matrix analysis topics. Applications of the material are outlined as well.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 505 Principles of Analysis I 3.0 Credits

Metric spaces, compactness, connectedness, completeness. Set theory and cardinality, continuity, differentiation, Riemann integral.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 506 Principles of Analysis II 3.0 Credits

A continuation of MATH 505. Uniform convergence, Fourier series, Lebesgue integral in Euclidean spaces, differential calculus in Euclidean spaces, inverse and implicit functions theorems, change of variables in multiple integrals.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 505 [Min Grade: C]

MATH 507 Applied Mathematics I 3.0 Credits

Covers matrix theory, linear transformations, canonical forms, matrix decompositions, and factorizations, including the singular value decomposition, quadratic forms, matrix least squares problems, and fast unitary transforms. Introduces computational linear algebra.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 508 Applied Mathematics II 3.0 Credits

Covers the techniques of mathematical modeling in the physical and biological sciences using discrete and combinatorial mathematics, probabilistic methods, variational principles, Fourier series and integrals, integral equations, calculus of variations, asymptotic series and expansions, and eigenvalue problems associated with Sturm-Liouville boundary value problems. Topics vary from year to year.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 507 [Min Grade: C]

MATH 509 Applied Mathematics III 3.0 Credits

Continues the theme of MATH 508. Topics vary from year to year.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 508 [Min Grade: C]

MATH 510 Applied Probability and Statistics I 3.0 Credits

Covers basic concepts in applied probability; random variables, distribution functions, expectations, and moment generating functions; specific continuous and discrete distributions and their properties; joint and conditional distributions; discrete time Markov chains; distributions of functions of random variables; probability integral transform; and central limit theorem.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 511 Applied Probability and Statistics II 3.0 Credits

Covers probability plots and graphical techniques for determining distribution of data, including sampling and sampling distributions, law of large numbers, parametric point estimation, maximum likelihood estimation, Bayes estimation, properties of estimators, sufficient statistics, minimum variance unbiased estimators, and parametric interval estimation. Introduces hypothesis testing.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 510 [Min Grade: C]

MATH 512 Applied Probability and Statistics III 3.0 Credits

Covers hypothesis testing, analysis of variance, multiple regression, and special topics. Introduces linear models.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 511 [Min Grade: C]

MATH 520 Numerical Analysis I 3.0 Credits

Covers polynomial interpolation, numerical solutions of nonlinear equations, numerical integration (Newton-Cotes, Gauss quadrature), error estimates of various numerical methods, and function approximation (polynomial, Fourier, Pade).

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 521 Numerical Analysis II 3.0 Credits

Covers numerical linear algebra and matrix computation, direct and iterative methods for solving linear systems and eigenvalue problems, least square problems, various matrix factorizations (QR, singular value decomposition, LU and Cholesky), and Krylov subspace methods.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 522 Numerical Analysis III 3.0 Credits

Covers numerical solutions of ordinary and partial differential equations.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 520 [Min Grade: C]

MATH 523 Computer Simulation I 3.0 Credits

Covers computer simulation of pseudo-random variables, including Monte Carlo methods.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 510 [Min Grade: C]

MATH 524 Computer Simulation II 3.0 Credits

Covers discrete and continuous event simulation models and techniques.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 523 [Min Grade: C]

MATH 525 Topics in Computer Simulation 3.0 Credits

Covers statistical analysis of simulation data, variance reduction techniques, and advanced topics in simulation.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 524 [Min Grade: C]

MATH 530 Combinatorial Mathematics I 3.0 Credits

Covers graphs and networks, with an emphasis on algorithms. Includes minimum spanning trees, shortest path problems, connectivity, network flows, matching theory, Eulerian and Hamiltonian tours, graph coloring, and random graphs.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 531 Combinatorial Mathematics II 3.0 Credits

Covers mathematical tools for the analysis of algorithms, including combinatorics, recurrence relations and generating functions, elementary asymptotics, and probabilistic methods.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 530 [Min Grade: C]

MATH 532 Topics in Combinatorial Math 3.0 Credits

Covers topics in discrete mathematics, including asymptotic enumeration, number theory, probabilistic combinatorics, and combinatoric algorithms.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 531 [Min Grade: C]

MATH 533 Abstract Algebra I 3.0 Credits

Covers groups, transformation groups and group actions, isomorphism and homomorphism theorems, Sylow theorems, symmetric groups, rings, and fields.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 534 Abstract Algebra II 3.0 Credits

Covers factorization domains, Euclidean domains, and polynomial rings, and modules, vector spaces, and linear transformations.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 533 [Min Grade: C]

MATH 535 Topics in Abstract Algebra 3.0 Credits

This third course in the Abstract Algebra sequence covers a selection of topics in advanced modern algebra such as symmetries, representation theory, algebraic geometry, homological algebra, Galois Theory and coding theory.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 3 times for 9 credits

Prerequisites: MATH 533 [Min Grade: C] and MATH 534 [Min Grade: C]

MATH 536 Topology I 3.0 Credits

Covers general topological spaces, metric spaces, and function spaces; open sets, limit points, limits of sequences, convergence, separation axioms, compactness, connectedness, continuity, homeomorphisms, and product of N -spaces; and specialized applications to the real line, Euclidean N -space, and well-known function spaces.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 537 Topology II 3.0 Credits

Continues MATH 536.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 538 Manifolds 3.0 Credits

Topics will be selected from the following: Differential structures, immersion theorems, tangent bundles, vector fields and distributions, integral manifolds, integration on manifolds, differential forms, general Stokes Theorem, applications to physics and engineering.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 540 Numerical Computing 3.0 Credits

Intended to introduce students to contemporary computing environments and the associated tools. Uses contemporary software tools and specific applications from science and engineering to illustrate numerical and visualization methods.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 544 Advanced Engineering Mathematics I 3.0 Credits

Covers solution techniques for ordinary differential equations, including series techniques, Legendre and Bessel functions, Sturm-Liouville theory, and Laplace and Fourier techniques. Introduces symbolic computation as it permits.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 545 Advanced Engineering Mathematics II 3.0 Credits

Covers partial differential equations, including separation of variables and its applications to standard equations. Introduces Green's functions for differential equations.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 544 [Min Grade: C]

MATH 546 Advanced Engineering Mathematics III 3.0 Credits

Covers complex analysis, including complex differentiation and integration, Cauchy's theorems and residue theory, and their applications; conformal maps; and applications to fluid flow.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 545 [Min Grade: C]

MATH 553 Sci Comp & Visualization I 3.0 Credits

Covers scientific computing, with an emphasis on numerical computing and visualization techniques. Includes techniques of computational geometry, including an introduction to methods used to describe the shapes of free-form curves, surfaces, and volumes, and applications to computer-aided design and other areas of scientific computing.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 540 [Min Grade: C]

MATH 554 Sci Comp & Visualization II 3.0 Credits

Covers scientific visualization, using a computational environment that includes high-performance workstations and supercomputers, and application in science and engineering. Includes applications to finite element and difference methods.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 553 [Min Grade: C]

MATH 555 Topics in Sci Comp & Visualiz 3.0 Credits

Covers special topics chosen from contemporary problem areas in scientific computing and visualization, including digital image processing, wavelet transforms and their numerical treatment, numerical conformal mapping, and contemporary problem areas in scientific computing and visualization.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 554 [Min Grade: C]

MATH 572 Financial Mathematics: Fixed Income Securities 3.0 Credits

The course is a mathematical introduction to interest rates and interest rates related instruments including loans, bonds, mortgages and swaps. The course emphasizes the mathematical aspects of the subject and computational implementation.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 610 Probability Theory I 3.0 Credits

Covers basics of modern probability theory: properties of probability measures, independence, Borel-Cantelli lemma, zero-one law, random variables, distribution theory, and expectations.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 633 [Min Grade: C]

MATH 611 Probability Theory II 3.0 Credits

Covers further development of modern probability theory, including modes of convergence of random variables, series of random variables, weak and strong laws of large numbers, characteristics functions, inversion formula and continuity theorem, and central limit theorem.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 610 [Min Grade: C]

MATH 612 Topics in Probability Theory 3.0 Credits

This third course in the probability sequence covers a selection of topics in modern probability theory. Topics may include: theory of sums of independent random variables, inequalities, martingale theory, combinatorial probability.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 2 times for 6 credits

Prerequisites: MATH 611 [Min Grade: C]

MATH 613 Stochastic Processes I 3.0 Credits

Covers conditional probabilities, expectations, Markov chains, classification of states, recurrence and absorption probabilities, asymptotic behavior, random walk, birth and death processes, and ruin problems.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 510 [Min Grade: C] and MATH 611 [Min Grade: C]

MATH 614 Stochastic Processes II 3.0 Credits

Covers queuing theory, waiting line models, embedded Markov chain method, and optimization problems. Includes applications and simulation.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 613 [Min Grade: C]

MATH 615 Topics in Stochastic Processes 3.0 Credits

Covers topics including branching processes, Brownian motion, renewal processes, compounding stochastic processes, martingales, and decision-making under uncertainty.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 613 [Min Grade: C]

MATH 620 Partial Differential Equations I 3.0 Credits

Covers derivation and classification of partial differential equations; elementary methods of solution, including Fourier series and transform techniques; linear and equilinear equations of the first order; hyperbolic, elliptic, and parabolic type equations; maximum principles; existence, uniqueness, and continuous dependence theorems; Riemann's method; method of characteristics; Green's functions; and variational and numerical methods.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 621 Partial Differential Equations II 3.0 Credits

Continues MATH 620.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 622 Partial Differential Equations III 3.0 Credits

Continues MATH 621.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 623 Ordinary Differential Equations I 3.0 Credits

Covers existence and uniqueness theorems, properties of solutions, adjoint equations, canonical forms, asymptotic behavior, phase space, method of isocline, classification of singular points, linear two-dimensional autonomous systems, non-linear systems, stability theory, Lyapunov's methods, quadratic forms, construction of Lyapunov's function, boundedness, limit sets, applications to controls, linear equations with periodic coefficients, Floquet theory, characteristic multipliers and exponents, existence of periodic solutions to weakly non-linear systems, jump phenomena, subharmonic resonance, and stability of periodic solutions.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 624 Ordinary Differential Equations II 3.0 Credits

Continues MATH 623.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 625 Ordinary Differential Equations III 3.0 Credits

Continues MATH 624.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 630 Complex Variables I 3.0 Credits

Covers Cauchy's theorem, Morera's theorem, infinite series, Taylor and Laurent expansions, residues, conformal mapping and applications, analytic continuation, and Riemann mapping theorem.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 631 Complex Variables II 3.0 Credits

Covers entire functions, Picard's theorem, series and product developments, Riemann Zeta function, and elliptic functions.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 630 [Min Grade: C]

MATH 632 Topics in Complex Variables 3.0 Credits

Covers topics including global analytic functions, algebraic functions, and linear differential equations in the complex plane.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 631 [Min Grade: C]

MATH 633 Real Variables I 3.0 Credits

Covers algebra of sets, topology of metric spaces, compactness, completeness, function spaces, general theory of measure, measurable functions, integration, convergence theorems, and applications to classical analysis and integration.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 634 Real Variables II 3.0 Credits

Covers Fubini's theorem, Radon-Nikodym theorem, LP-spaces, linear functionals on LP-spaces, Riesz-representation theorem, topological integration, Riesz-Markoz theorem, Luzin's theorem, basic complex functions, analytic functions, and complex-integration.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 633 [Min Grade: C]

MATH 635 Real Variables III 3.0 Credits

Covers topics including differentiation theory, Fourier series and transforms, and singular integrals.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 634 [Min Grade: C]

MATH 640 Functional Analysis 3.0 Credits

An introduction to abstract linear spaces, including normed linear spaces, Hilbert spaces, Banach spaces, and their duals. Fundamental theorems such as the Hahn-Banach theorem, open mapping and closed graph theorems will be covered, along with possible applications to differential and integral equations and fundamentals of distribution theory.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 504 [Min Grade: C] and MATH 506 [Min Grade: C]

MATH 641 Harmonic Analysis 3.0 Credits

Covers modern techniques and applications of harmonic analysis, including Fourier series, Fourier transforms and related topics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 640 [Min Grade: C]

MATH 642 Operator Theory 3.0 Credits

An introduction to basic spectral theory of linear operators, theory of compact operators, and theory of unbounded operators.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 640 [Min Grade: C]

MATH 643 Integral Equations I 3.0 Credits

Covers theory and application of linear integral equations, including the Hilbert-Schmidt theory. Introduces non-linear and singular integral equations and numerical methods.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 645 Transform Theory I 3.0 Credits

Covers selected topics from wavelet transforms, including properties; asymptotic analyses; and applications of the integral transforms of Laplace, Fourier, Mellin, and Radon.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 640 [Min Grade: C]

MATH 646 Transform Theory II 3.0 Credits

Covers selected topics from wavelet transforms and applications, convolution equations, and the calculus of distributions.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 640 [Min Grade: C] and MATH 645 [Min Grade: C]

MATH 660 Lie Groups and Lie Algebras I 3.0 Credits

Covers matrix groups, topological groups, locally isomorphic groups, universal covering groups, analytic manifolds, Lie groups; the Lie algebra of a Lie group, differential forms, and Lie's three theorems; analytic subgroups of a Lie group and compact Lie groups; and semisimple Lie algebras, general structure of Lie algebras, Cartan subalgebras, modules and representation, and computational techniques in representation theory.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 661 Lie Groups and Lie Algebras II 3.0 Credits

Continues MATH 660.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 662 Lie Groups/Algebras III 3.0 Credits

Continues MATH 661.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 670 Methods of Optimization I 3.0 Credits

Provides a rigorous treatment of theory and computational techniques in linear programming and its extensions, including formulation, duality theory, simplex and dual-simplex methods, and sensitivity analysis; network flow problems and algorithms; systems of inequalities, including exploiting special structure in the simplex method and use of matrix decompositions; and applications in game theory and integer programming.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 671 Methods of Optimization II 3.0 Credits

Covers necessary and sufficient conditions for unconstrained and constrained optimization. Includes computational methods including quasi-Newtonian and successive quadratic programming, and penalty and interior methods.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 672 Methods of Optimization III 3.0 Credits

Covers advanced topics in mathematical programming, including interior point methods in linear programming; stochastic optimization; multi-objective optimization; and global minimax, functional, and non-linear least squares optimization methods.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 670 [Min Grade: C] and MATH 671 [Min Grade: C]

MATH 673 Calculus of Variations 3.0 Credits

Introduction to calculus of variations. Covers applications to geometry, classical mechanics and control theory, Euler-Lagrange equations, problems with constraints, canonical equations, Hamiltonian mechanics, symmetries and Noether's theorem, Hamilton-Jacobi theory, introduction to optimal control, maximum principle, and Hamilton-Jacobi-Bellman equations.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 680 Special Topics 0.5-9.0 Credits

Covers special topics of interest to students and faculty.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

MATH 699 Independent Study in Math 0.5-6.0 Credits

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

MATH 701 Algebraic Combinatorics 3.0 Credits

This course covers methods of Abstract Algebra that can be applied to various combinatorial problems and conversely, combinatorial methods to approach problems in representation theory, algebraic geometry, and homological algebra.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: MATH 533 [Min Grade: C] and MATH 534 [Min Grade: C]

MATH 723 Mathematical Neuroscience 3.0 Credits

This is an introduction to mathematical and computational techniques for analyzing neuronal models. Topics include conductance based models, neuronal excitability, bursting, neural networks, and compartmental models, as well as phase plane analysis, slow-fast systems, elements of applied bifurcation theory, and simulating differential equation models using MATLAB.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 799 Independent Study in Math 6.0 Credits

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

MATH 898 Master's Thesis 0.5-20.0 Credits

Master's thesis.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

MATH 997 Research 1.0-12.0 Credit

Research.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

MATH 998 Ph.D. Dissertation 1.0-12.0 Credit

Ph.D. dissertation.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Physics

Master of Science: 45.0 quarter credits

Doctor of Philosophy: 90.0 quarter credits

About the Program

The Department of Physics offers opportunities for students to study with leading researchers in astrophysics, biophysics, nonlinear dynamics, particle physics, and solid state physics, as well as to participate in international collaborations. Coursework for the MS and PhD degrees includes advanced training in core areas of physics and in the topics of current research. PhD students begin research early in the program, commencing thesis work in their second year of study.

To learn more about the graduate program in physics visit the Physics Department (<http://www.drexel.edu/physics>) webpage.

Admission Requirements

For admission to the graduate programs, a bachelor's degree in an approved program is required with a minimum undergraduate GPA of 3.0/4.0 specified.

The GRE Subject Test is required for PhD applicants to be considered for assistantships.

- minimum Quantitative Score = 150 (650 on previous 800-point scale)
- minimum Verbal Score = 150 (450 on previous 800-point scale).

Students from non-English speaking countries are required to demonstrate proficiency in English via the TOEFL exam. TOEFL scores are required for international applicants or applicants who earned a degree outside the US (minimum scores: 100/600/250). Scores will be reviewed based on section scores and total scores. IELTS scores may be submitted in lieu of TOEFL scores. The minimum IELTS band score is 7.0. Teaching assistants educated in non-English speaking countries must complete a special English program.

Visit the Graduate Admissions (<http://www.drexel.edu/grad/programs/coas/physics>) website for more information about requirements and deadlines, as well as instructions for applying online.

Master of Science in Physics

Students who wish to complete only the master's degree are welcomed, and will find that the learning environment will allow them to broaden their professional understanding by exploring current topics and trends of physics in an interdisciplinary setting.

There are no thesis, language, or special examination requirements for the master's degree.

The degree requires 45.0 graduate credits, with at least 30.0 credits from the following:

PHYS 501	Mathematical Physics I	3.0
PHYS 502	Mathematical Physics II	3.0
PHYS 506	Dynamics I	3.0
PHYS 511	Electromagnetic Theory I	3.0
PHYS 512	Electromagnetic Theory II	3.0
PHYS 516	Quantum Mechanics I	3.0
PHYS 517	Quantum Mechanics II	3.0
PHYS 518	Quantum Mechanics III	3.0

PHYS 521	Statistical Mechanics I	3.0
PHYS 522	Statistical Mechanics II	3.0

PhD in Physics

90.0 quarter credits

The Department of Physics offers opportunities for students to study with leading researchers in astrophysics, biophysics, nonlinear dynamics, particle physics, and solid state physics, as well as to participate in international collaborations. Coursework for the PhD degree includes advanced training in core areas of physics and topics of current research. PhD students begin research early in the program, commencing thesis work in their second year of study.

The usual schedule for physics graduate students consists of two years of coursework, qualifying exams, and research training, followed by dissertation research. All PhD students follow a common set of ten core courses during their first two years of study. In addition to these core courses, students also take four special topics courses.

PhD students Admitted with Post-Master's Status

Students who are admitted for PhD study with "post-masters" status must take 15 credits of graduate coursework with a minimum GPA of 3.0 to become doctoral candidates. Courses are to be chosen in consultation with the Director of Graduate Studies. Post-masters students are expected to pass the written and oral qualifying exams by the end of the Spring quarter of their first year of study. Ordinarily, this means taking the written qualifying exam in September before the start of classes. To be prepared for the oral exam, post-masters students should begin research as soon as possible.

Program Requirements

Doctoral candidates are required to complete a minimum of 45.0 credits of coursework and research work beyond the master's requirement of 45.0 credits while maintaining a minimum of 3.0 GPA.

Core Courses

First Year

PHYS 501	Mathematical Physics I	3.0
PHYS 506	Dynamics I	3.0
PHYS 502	Mathematical Physics II	3.0
PHYS 516	Quantum Mechanics I	3.0
PHYS 521	Statistical Mechanics I	3.0
PHYS 517	Quantum Mechanics II	3.0

Second Year

PHYS 522	Statistical Mechanics II	3.0
PHYS 518	Quantum Mechanics III	3.0
PHYS 511	Electromagnetic Theory I	3.0
PHYS 512	Electromagnetic Theory II	3.0
Select four of the following:		12.0
PHYS 531	Galactic Astrophysics	
PHYS 532	Cosmology	
PHYS 561	Biophysics	
PHYS 553	Nanoscience	
PHYS 562	Computational Biophysics	

PHYS 563	Single Molecule Methods	
PHYS 571	Nonlinear Dynamics	
PHYS 576	Introduction to Particle Physics	
PHYS 626	Solid State Physics I	
PHYS 750	Special Topics	

Total Credits **42.0**

Research Training

Students begin research in the first year with two small projects. In the spring quarter, this project culminates in a talk presented to the other students and Director of Graduate Studies. In the summer quarter, the project requires a written report to the research advisor. Research during the second year is toward the oral qualifying exam, described below.

Candidacy Examination

PhD candidates must pass a Candidacy Examination, which consist of two parts: written and oral:

- The written portion of the qualifying examination is given twice a year, during the week before the fall quarter begins and during the first week of classes of the winter term. Students must pass the written qualifying examination no later than the winter quarter of their second year. At most two attempts may be made at passing the exam. The qualifying examination covers four general areas at the advanced undergraduate level: classical mechanics, electricity and magnetism, quantum mechanics, and statistical physics.
- The oral portion of the qualifying exam is based on original research performed by the student, which consists in an oral presentation and a written report of no less than 15 pages, submitted to the examination committee and the Director of Graduate Studies at least one week prior to the exam. Immediately after the public presentation, the Examination Committee will privately conduct an oral examination. This exam must be passed by the end of the second year of study.

Dissertation Defense

This dissertation defense includes a final public presentation and defense of the dissertation. The dissertation must be submitted to the Examination Committee at least two weeks prior to the oral defense. The oral presentation involves a public 45-60 minute presentation by the candidate followed by an unspecified period during which the Examination Committee will ask questions. All doctoral dissertations, in addition to originality and scholarly content, must conform to University format requirements.

Plan of Study (PhD)

The following sample plan of study contains the required courses for full-time PhD students entering without a previous Master's degree. Post-master's students should consult the Director of Graduate Studies.

First Year

Fall		Credits
PHYS 501	Mathematical Physics I	3.0
PHYS 506	Dynamics I	3.0
Special Topics Course*		3.0

Term Credits **9.0**

Winter

PHYS 502	Mathematical Physics II	3.0
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PHYS 516	Quantum Mechanics I	3.0
Special Topics Course*		3.0
Term Credits		9.0
Spring		
PHYS 521	Statistical Mechanics I	3.0
PHYS 517	Quantum Mechanics II	3.0
Term Credits		6.0
Second Year		
Fall		
PHYS 522	Statistical Mechanics II	3.0
PHYS 518	Quantum Mechanics III	3.0
Special Topics Course*		3.0
Term Credits		9.0
Winter		
PHYS 511	Electromagnetic Theory I	3.0
Special Topics Course*		3.0
Term Credits		6.0
Spring		
PHYS 512	Electromagnetic Theory II	3.0
PHYS 997	Research	1.0-12.0
Term Credits		4.0-15.0
Total Credit: 43.0-54.0		

* Special topics courses are an introduction to current topics of experimental and theoretical interest. They are offered in alternate years.

Academic Year 2013/2014 (odd)

Fall		Credits
PHYS 531	Galactic Astrophysics	3.0
PHYS 561	Biophysics	3.0
Term Credits		6.0
Winter		
PHYS 532	Cosmology	3.0
PHYS 562	Computational Biophysics	3.0
Term Credits		6.0
Spring		
PHYS 563	Single Molecule Methods	3.0
PHYS 750	Special Topics (Quantum Field Theory)	3.0
Term Credits		6.0
Total Credit: 18.0		

Academic Year 2014/2015 (even)

Fall		Credits
PHYS 626	Solid State Physics I	3.0
PHYS 576	Introduction to Particle Physics	3.0
Term Credits		6.0
Winter		
PHYS 553	Nanoscience	3.0
PHYS 571	Nonlinear Dynamics	3.0
Term Credits		6.0

Spring

To be announced

Term Credits	0.0
Total Credit: 12.0	

Additional information for graduate students is available at the Department of Physics (<http://www.physics.drexel.edu>).

Facilities

Astrophysics Facilities

- Numerical Astrophysics Facility, primarily networked LINUX workstations emphasizes theoretical and numerical studies of stars, star clusters, the early universe, galaxy distributions, cosmology modeling and gravitational lensing. Large file server provides access to Sloan Digital Sky Survey data. The facility also employs special purpose high performance computers, such as the Gravity Pipeline Engine (GRAPE), a new Beowulf cluster (128 processors, 128G RAM, 2TB RAID disk), and a system using Graphics Processing Units to achieve computational speeds of up to trillion floating point operations per second.
- The Joseph R. Lynch Observatory houses a 16 inch MEAD Schmidt-Cassegrain telescope equipped with SBIG CCD camera. Drexel is a participant in the Sloan Digital Sky Survey, which operates a 2.5m telescope at Apache Point, NM, and the Large Synoptic Survey Telescope to be built in Chile (first light 2020).

Biophysics Facilities

- Modulated excitation kinetics laboratory uses frequency domain techniques to follow internal dynamics of biological molecules.
- Energy Materials Research Laboratory including Variable Temperature UHV Scanning Probe Microscope, installed in STC-50 rated acoustic chamber.
- Spatially resolved kinetics laboratory uses simultaneously resolved spatio-temporal data at microscopic resolution to follow biological self-assembly processes, such as polymerization of sickly hemoglobin.
- Atomic Force Microscope (AFM) facility to study the structure and interaction of macromolecule via imaging, and to investigate the mechanical and kinetic properties of individual protein molecules via nanomanipulation.
- Computational Biophysics facility including two Beowulf clusters (44-node dual-core Xeon, 43-note dual quad-core Xeon [344 cores]), 24TB RAID disk server, and ten Linux workstations connected through a gigabit network (3).
- Preparative laboratory provides facilities for biological sample purification and characterization.

Condensed Matter Facilities

- Ultra-low temperature laboratory has 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.
- Magnetic material laboratory conducts research on amorphous magnetic thin films, fiber optical sensors.
- Surface science laboratory has scanning probe microscopy to study surface structure interfaces at the atomic level.

Particle Physics Facilities

- Detector development laboratory provides experimental support for an international research program in nonaccelerator particle and nuclear physics performing tests of invariance principles and conservation laws, and neutrino oscillations.

General Support Facilities

- Include an electronics shop capable of custom design and fabrication of electronics and computer components, and a machine shop to assist in the design, construction, and repair of mechanical components.

Facilities

Astrophysics Facilities:

- The Numerical Astrophysics Facility emphasizes theoretical and numerical studies of stars, star clusters, the early Universe, galaxy distributions, cosmology modeling, and gravitational lensing. The facility employs special purpose high-performance computers, such as the Gravity Pipeline Engine (GRAPE), a new Beowulf cluster (128 processors, 128G RAM, 2TB RAID disk), and a system using Graphics Processing Units to achieve computational speeds of up to a trillion floating point operations per second. The Joseph R. Lynch Observatory houses a 16-inch Mead Schmidt-Cassegrain telescope equipped with SBIG CCD camera. Drexel faculty and students are active in analyzing data from the Sloan Digital Survey, which operates a 2.5m telescope at Apache Point, N.M., and the Large Synoptic Survey Telescope to be built in Chile (first light 2020).

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.
- Fluorescence microscope to resolve fast biomolecular dynamics in living cells.
- The Computational Biophysics facility also includes two Beowulf clusters (44-node dual-core Xeon, 43-node dual quad-core Xeon [344 cores]), 24TB RAID disk server, and ten Linux workstations connected through a gigabit network.

Condensed Matter Facilities:

- Ultra-low temperature laboratory has 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 Energy Materials Research Laboratory includes a Variable Temperature UHV Scanning Probe Microscope installed in an STC-50 rated acoustic chamber.
- The Magnetic material laboratory conducts research on amorphous magnetic thin films and fiber optical sensors.
- The Surface science laboratory has a scanning probe microscopy to study surface structure interfaces at the atomic level.

Particle Physics Facilities:

- The Detector Development Laboratory provides experimental support for an international research program in nonaccelerator particle and Nuclear Physics performing tests of invariance principles and conservation laws, searches for rare interactions, and neutrino properties.

Laboratory for High-Performance Computational Physics:

- This computer lab has 15 powerful workstations-each with Intel Core i5 3570 running at 3.4 Ghz, 16 Gb RAM, and an nVidia GTX 650 graphics card. They are running Ubuntu 13.04 operating system. Each workstation has a 24 inch screen monitor. These world-class workstations are connected to our main file server via the highest quality gigabyte network connectors.

Courses

PHYS 501 Mathematical Physics I 3.0 Credits

Covers various topics in mathematical physics and their numerical implementations, including calculus of residues and further applications of complex variables; vector spaces, Fourier series, and generalized functions; integral transforms; theory and application of ordinary and partial differential equations; special functions; boundary value and initial value problems; Green's function theory and applications; and integral equations.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 502 Mathematical Physics II 3.0 Credits

Continues PHYS 501.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 503 Mathematical Physics III 3.0 Credits

Calculus of residues and further applications of complex variables; vector spaces, Fourier series and generalized functions; integral transforms; theory and application of ordinary and partial differential equations; special functions; boundary value and initial value problems; Green's function theory and applications; integral equations; group theory; nonlinear dynamics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 506 Dynamics I 3.0 Credits

Covers Lagrangian-Hamiltonian formulations, variational principles, particle kinematics and dynamics, and small oscillations and normal modes.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 507 Dynamics II 3.0 Credits

Lagrangian-Hamiltonian formulations; variational principles; particle kinematics and dynamics; small oscillations and normal modes; Navier-Stokes equations; statistical description of turbulent flows; thermodynamics and energetics of ideal gases; computational fluid dynamics; viscous and compressible flows; boundary-layer flows; hydrodynamic perturbation and stability theory; nonlinear dynamics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 508 Dynamics III 3.0 Credits

Lagrangian-Hamiltonian formulations; variational principles; particle kinematics and dynamics; small oscillations and normal modes; Navier-Stokes equations; statistical description of turbulent flows; thermodynamics and energetics of ideal gases; computational fluid dynamics; viscous and compressible flows; boundary-layer flows; hydrodynamic perturbation and stability theory; nonlinear dynamics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 511 Electromagnetic Theory I 3.0 Credits

Covers electrostatics, magnetostatics, electromagnetic waves, boundary value problems of electromagnetic theory, theory of Fresnel and Fraunhofer diffraction, classical electrodynamics, special relativity, waveguides, and radiation theory.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 512 Electromagnetic Theory II 3.0 Credits

Continues PHYS 511.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 513 Electromagnetic Theory III 3.0 Credits

Electrostatics; magnetostatics; electromagnetic waves; boundary value problems of electromagnetic theory; theory of Fresnel and Fraunhofer diffraction; classical electrodynamics; special relativity; waveguides; radiation theory; plasmas.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 516 Quantum Mechanics I 3.0 Credits

Covers axioms of quantum mechanics and the basic mathematical tools, one-dimensional Schrodinger equation, spin and general two-level systems, harmonic oscillator, general theory of angular momentum, hydrogen atom, elements of atomic spectroscopy, quantum theory of scattering, electron spin, addition of angular momenta, stationary and time-dependent perturbation theory, fine and hyperfine structure of the hydrogen atom, interaction of light and matter, and Dirac Equation.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 517 Quantum Mechanics II 3.0 Credits

Continues PHYS 516.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 518 Quantum Mechanics III 3.0 Credits

Continues PHYS 517.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 521 Statistical Mechanics I 3.0 Credits

Covers thermodynamics; probability theory; Gibbs-Boltzmann formulation; relation between density of states and entropy; partition functions; ensembles; Maxwell-Boltzmann, Bose-Einstein, Fermi-Dirac, phonon, photon, and electron systems; and phase transitions.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 522 Statistical Mechanics II 3.0 Credits

Continues PHYS 521.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 523 Statistical Mechanics III 3.0 Credits

Thermodynamics; probability theory; Gibbs-Boltzmann formulation; relation between density of states and entropy; partition functions; ensembles; Maxwell-Boltzmann, Bose-Einstein, Fermi-Dirac, phonon, photon, and electron systems; phase transitions.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 531 Galactic Astrophysics 3.0 Credits

The goal of this course is to present 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 the properties of these magnificent objects, near and far. For the most part, these tools will be based on familiar concepts in classical mechanics and thermodynamics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 532 Cosmology 3.0 Credits

Covers cosmological models, age and distance scales in the universe, the hot big bang, primordial nucleosynthesis, 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

PHYS 541 Atmospheric Physics I 3.0 Credits

Chemical composition, transformation and evolution; radiation spectra, absorption, scattering and heat transfer; thermodynamics and cloud and precipitation microphysics; surface fluxes, thermal structure and energy balance; optics and acoustics: observational methods and remote-sensing techniques.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 542 Atmospheric Physics II 3.0 Credits

Chemical composition, transformation and evolution; radiation spectra, absorption, scattering and heat transfer; thermodynamics and cloud and precipitation microphysics; surface fluxes, thermal structure and energy balance; optics and acoustics: observational methods and remote-sensing techniques.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 543 Atmospheric Physics III 3.0 Credits

Chemical composition, transformation and evolution; radiation spectra, absorption, scattering and heat transfer; thermodynamics and cloud and precipitation microphysics; surface fluxes, thermal structure and energy balance; optics and acoustics: observational methods and remote-sensing techniques.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 544 Large Scale Atmospheric Dynamics I 3.0 Credits

Theoretical thermodynamics and atmospheric energetics; flow on a rotating sphere; general circulation; barotropic and baroclinic instability; cyclonic circulations.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 545 Large Scale Atmospheric Dynamics II 3.0 Credits

Theoretical thermodynamics and atmospheric energetics; flow on a rotating sphere; general circulation; barotropic and baroclinic instability; cyclonic circulations.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 546 Large Scale Atmospheric Dynamics III 3.0 Credits

Theoretical thermodynamics and atmospheric energetics; flow on a rotating sphere; general circulation; barotropic and baroclinic instability; cyclonic circulations.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 547 Small Scale Atmospheric Dynamics I 3.0 Credits

Theory of turbulent flows and perturbation analysis of waves; boundary-layer processes, including diffusion; storm microphysics and dynamics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 548 Small Scale Atmospheric Dynamics II 3.0 Credits

Theory of turbulent flows and perturbation analysis of waves; boundary-layer processes, including diffusion; storm microphysics and dynamics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 549 Small Scale Atmospheric Dynamics III 3.0 Credits

Theory of turbulent flows and perturbation analysis of waves; boundary-layer processes, including diffusion; storm microphysics and dynamics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 553 Nanoscience 3.0 Credits

Physical basis of nanoscale materials and systems including discussion 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

PHYS 561 Biophysics 3.0 Credits

A one-course introduction to Biophysics. Topics may include structure of biomolecules, protein stability, electron transfer, protein folding, protein substrates, allostery, and self-assembly. No biological background is assumed.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 562 Computational Biophysics 3.0 Credits

Covers 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

PHYS 563 Single Molecule Methods 3.0 Credits

Covers the principles, operations and applications of the most commonly used single molecule methods in biophysics, including scanning probe microscopy and spectroscopy, optical trapping and fluorescence resonance energy transfer techniques.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 571 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

PHYS 576 Introduction to Particle Physics 3.0 Credits

This course provides an introduction to the physics of fundamental particles. Topics include 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

PHYS 601 Advanced Quantum Mechanics I 3.0 Credits

Relativistic one-particle quantum mechanics; Dirac theory radiation theory; free fields; interactions; quantum electrodynamics; introduction to elementary particle theory; quantum chromodynamics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 602 Advanced Quantum Mechanics II 3.0 Credits

Relativistic one-particle quantum mechanics; Dirac theory radiation theory; free fields; interactions; quantum electrodynamics; introduction to elementary particle theory; quantum chromodynamics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 603 Advanced Quantum Mechanics III 3.0 Credits

Relativistic one-particle quantum mechanics; Dirac theory radiation theory; free fields; interactions; quantum electrodynamics; introduction to elementary particle theory; quantum chromodynamics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 626 Solid State Physics I 3.0 Credits

Crystal lattices; Bloch theorem; classical and quantum theory of lattice vibrations; phonons, electron states in solids; calculation of energy bands and Fermi surfaces; dynamics of electrons in metals; electron-electron interactions; plasmons; electron-phonon interactions; polarons; semiconductor and insulator crystals; transport properties of solids; thermal properties; optical properties; magnetism; magnons; superconductivity.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 627 Solid State Physics II 3.0 Credits

Crystal lattices; Bloch theorem; classical and quantum theory of lattice vibrations; phonons, electron states in solids; calculation of energy bands and Fermi surfaces; dynamics of electrons in metals; electron-electron interactions; plasmons; electron-phonon interactions; polarons; semiconductor and insulator crystals; transport properties of solids; thermal properties; optical properties; magnetism; magnons; superconductivity.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 628 Solid State Physics III 3.0 Credits

Crystal lattices; Bloch theorem; classical and quantum theory of lattice vibrations; phonons, electron states in solids; calculation of energy bands and Fermi surfaces; dynamics of electrons in metals; electron-electron interactions; plasmons; electron-phonon interactions; polarons; semiconductor and insulator crystals; transport properties of solids; thermal properties; optical properties; magnetism; magnons; superconductivity.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 631 Relativity Theory I 3.0 Credits

Covers particle and field dynamics in special relativity, tensor calculus for Riemannian space-time manifolds, Einstein's gravitational field equations and their principal solutions in general relativity, black holes, general relativistic variational principles, big bang cosmology, and quantization of general relativity.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 632 Relativity Theory II 3.0 Credits

Continues PHYS 631.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 633 Relativity Theory III 3.0 Credits

Continues PHYS 632.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 643 Physics of the Upper Atmosphere 3.0 Credits

Structure of the methods of probing the upper atmosphere; solar radiation; aurorae; cosmic rays, the ionosphere; geomagnetism, meteors.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 644 Atmospheric Numerical Prediction Techniques 3.0 Credits

Application of modern numerical methods to the prediction of atmospheric motions; initialization and assimilation methods; filtering, verification, and testing.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 645 Atmospheric Analysis Techniques 3.0 Credits

Covers analysis and interpretation of meteorological data, including statistical and objective techniques. Uses data sources including satellites, radars, and special observational networks. Includes evaluation of analysis techniques, and initialization and assimilation in numerical models.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 646 Atmospheric Turbulence and Diffusion 3.0 Credits

Introduction to mechanics of turbulence, structure of atmospheric turbulence and its role in diffusion of contaminants.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 676 Nuclear Physics I 3.0 Credits

Review of systematics of experimental phenomena; nuclear structure theory, including shell model, interacting-boson model, Hartree-Fock approaches, and collective models; intermediate energy theory and experiment, including electron, nucleon, and pion scattering and reactions; group theoretical approaches; interfaces of quark-meson-nucleon coexistence.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 677 Nuclear Physics II 3.0 Credits

Review of systematics of experimental phenomena; nuclear structure theory, including shell model, interacting-boson model, Hartree-Fock approaches, and collective models; intermediate energy theory and experiment, including electron, nucleon, and pion scattering and reactions; group theoretical approaches; interfaces of quark-meson-nucleon coexistence.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 678 Nuclear Physics III 3.0 Credits

Review of systematics of experimental phenomena; nuclear structure theory, including shell model, interacting-boson model, Hartree-Fock approaches, and collective models; intermediate energy theory and experiment, including electron, nucleon, and pion scattering and reactions; group theoretical approaches; interfaces of quark-meson-nucleon coexistence.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 699 Independent Study 1.0-6.0 Credit

Independent study in Physics under direction of a faculty member.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 4 times for 12 credits

PHYS 750 Special Topics 0.5-9.0 Credits

Assignment of readings and study in current topics of experimental and theoretical interest.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

PHYS 865 Overview of Graduate Physics I 3.0 Credits

Methodology for efficient solution of Ph.D. candidacy exam-type problems; main quantitative theoretical relations and selected problems reviewed in mathematical physics, classical mechanics, electromagnetism, optics, quantum mechanics, thermodynamics, statistical physics, and atomic physics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 898 Master's Thesis 0.5-20.0 Credits

Master's thesis.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PHYS 997 Research 1.0-12.0 Credit

Research.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

PHYS 998 Ph.D. Dissertation 1.0-12.0 Credit

Ph.D. dissertation.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

Programs in Psychology and Clinical Psychology

Master of Science: 45.0 quarter credits

Doctor of Philosophy: 90.0 quarter credits

About the Programs

The MS in Psychology program is designed for students interested in advanced education in scientific psychology in order to obtain further educational or career opportunities.

The PhD in Psychology with the specialization in Clinical Psychology program places equal emphasis on clinical research and the application of scientific principles.

The PhD in Psychology with a specialization in Applied Cognitive and Brain Science program is designed for students who wish to pursue a research based career in human experimental psychology with a concentration in applied cognitive and brain science.

For more information, visit the Department of Psychology (<http://www.drexel.edu/psychology>) website.

Master of Science in Psychology

The master of science degree in the Department of Psychology, College of Arts & Sciences, is ideal for students interested in pursuing an advanced education in scientific psychology and research methods.

The program is an opportunity for students to take their first step into graduate education, and to begin a path toward further educational and

career opportunities. These opportunities include further graduate-level training leading to a PhD, a career in research, or other educational and administrative opportunities. The curriculum is focused on training in a range of research experience in neurocognitive and behavioral sciences. In addition to required coursework, students are required to complete a minimum of eight hours per week with a research mentor in laboratory activities. These activities culminate with the successful completion of an empirical thesis.

Requirements for Admission

Applicants must meet the general University requirements for admission, including a minimum 3.0 GPA (on a 4.0 scale) for the last two years of undergraduate study. Applicants to the graduate program in psychology are also required to submit scores from the Graduate Record Examination (GRE) general tests. Only applications for full-time status are considered.

Various factors are considered in choosing students. These include background in psychology, undergraduate (and, if applicable, graduate) GPA, GRE scores, a personal essay, and letters of recommendation. The minimum expected combined GRE score is 302, with scores 150 on each section (verbal, quantitative) of the GRE.

For additional information on how to apply, visit Drexel's Admissions Requirements for Psychology (<http://www.drexel.edu/grad/programs/coas/psychology>) page.

Degree Requirements

The general requirements for earning the MS degree in psychology are as follows:

- Completion of all required coursework with a minimum grade point average of 3.0, with no grade lower than a B in any required (non-elective) course and no more than two course grades of C or lower.
- Successful completion of a minimum of 45.0 course credits. Students take required courses and select additional electives.
- Successful completion of required research laboratory hours (8 hours per week for 2 years).
- Completion of an empirical thesis.

For more information on specific requirements, consult the Master's of Science in Psychology (<http://www.drexel.edu/psychology/academics/graduate/masters>) website.

PSY 510	Research Methods I	3.0
PSY 511	Research Methods II	3.0
PSY 512	Cognitive Psychology	3.0
PSY 610	Data Analysis in Psychology	3.0
PSY 624	Behavior Analysis	3.0
PSY 710	Data Analysis II	3.0
PSY 898	Master's Thesis in Psychology	3.0
PSY 898	Master's Thesis in Psychology	3.0
PSY 898	Master's Thesis in Psychology	3.0
Additional Electives		18.0
Total Credits		45.0

PhD in Psychology: Clinical Psychology

The Ph.D. Program in Clinical Psychology program is a scientist-practitioner-oriented program that is fully accredited by the American Psychological Association (APA). It encompasses five years of full-

time study and provides graduate students with a strong foundation in relevant psychological theory, experience in the practice of psychological assessment and intervention, experience in conducting meaningful clinical research, and opportunities to develop teaching competencies. See the Clinical Psychology Program's website (<http://www.drexel.edu/psychology/academics/graduate/clinical>) for more information.

Requirements for Admission

All students are admitted with the expectation that they intend to complete the PhD degree. However, before advancing to doctoral-level studies, students must earn the MS, including completion of a master's thesis. Admitted students who hold a bachelor's degree are expected to complete both the master's degree and post-master's portions of the Drexel curriculum. Applicants who already hold a master's from another university may be admitted with post-master's status if their graduate-level preparation is deemed equivalent to the master's portion of the Drexel curriculum.

Requirements for Students Enrolling with a Bachelor's Degree

For those entering with a bachelor's degree, the PhD program requires approximately five years to complete. The first two years of training correspond to the master's-level studies: focusing on clinical areas such as entry-level assessment and intervention skills, psychopathology, and specialized study in cognitive-behavior therapy, neuropsychology, health psychology, and/or forensic psychology. These two years also include a major focus on research skills, involving statistics, research design, and supervised research experience with the mentor. Entry-level assessment, intervention, and teaching skills are also developed.

By the end of the first two years of study, students should have completed 45.0 credits of coursework, maintained a GPA of at least 3.5, developed and defended a thesis, passed comprehensive examinations and completed 800 hours of practicum experience in the form of a clinical practicum. Students demonstrating satisfactory performance in these areas will be admitted to post-master's status.

Requirements for Students Who Already Hold a Master's Degree

Students entering with a master's degree from another university complete the PhD requirements in 4-5 years. The master's degree should have included an experimental thesis. Students lacking this prerequisite will still be considered for admission, but such students will be required to complete a research project equivalent to the Drexel master's thesis. In addition, students must demonstrate a GPA of at least 3.5 in master's-level courses in order to be accepted for post-master's status.

For additional information on how to apply, visit Drexel's Admissions Requirements for Psychology (http://www.drexel.edu/grad/programs/coas/apply/requirements/p_clps) page

Curriculum

The program in Clinical Psychology curriculum follows the scientist-practitioner model and APA guidelines on accreditation of doctoral clinical psychology programs. It also considers state licensing guidelines and various publications that have been written on the topic of doctoral education, training, and credentialing in clinical psychology, as well as the specialty areas of cognitive-behavior therapy, forensic psychology, health psychology, and neuropsychology.

The following section outlines the courses required for graduation for entering Bachelor's-level students. The PhD program curriculum requires the student to earn a minimum of 90.0 credits. Typically, students enroll in 27.0 credits during the first year, 22.0 credits during the second and

third years, 12.0 credits in the fourth year, and 8.0 credits during the fifth/final internship year. Drexel University operates on a calendar of four eleven-week terms. Students in the program do not take courses during summer term in order to complete research projects and continue clinical practicum training.

All coursework can be divided into two major components: (1) foundations of psychology, which is the evolving body of knowledge in the discipline of psychology, and (2) clinical and professional training, which focuses on the application of theory and empirical research to the practice of psychology. Listed below are all required and elective courses offered within the Drexel psychology curriculum followed by specific requirements for each concentration. Credit levels listed are set at the minimum required.

Required Courses

Foundations of Psychology

PSY 712	History and Systems	3.0
PSY 516	Developmental Psychology	3.0

Statistics/Research Methods

PSY 510	Research Methods I	3.0
PSY 610	Data Analysis in Psychology	3.0
PSY 710	Data Analysis II	3.0
PSY 711	Data Analysis III: Advanced Topics	3.0
PSY 898	Master's Thesis in Psychology	3.0
PSY 998	Ph.D. Dissertation in Psychology	4.0

Biological Bases of Behavior

PSY 630	Biological Basis of Behavior and Treatment	3.0
Select one of the following:		3.0
PSY 530	Neuroanatomy and Behavior	
PSY 865	Special Topics in Psychology (Neuroimaging and Physiology of Behavior)	

Cognitive/Affective Bases of Behavior

PSY 812	Cognitive Neuroscience	3.0
Select one of the following:		3.0
PSY 512	Cognitive Psychology	
PSY 612	Psychology of Human-Computer Interaction Design	
PSY 614	Problem Solving & Creativity	

Social Bases of Behavior

PSY 550	Multicultural Perspectives in Psychology	3.0
PSY 518	Social Psychology	3.0

Clinical and Professional Training General Foundations of Practice

PSY 560	Teaching and Consultation (1.0 credit course taken 3 times)	3.0
PSY 520	Psychopathology	3.0
PSY 524	Professional Issues and Ethics	3.0

Foundations of Psychological Evaluation/Measurement

PSY 522	Psychological and Intellectual Assessment	3.0
PSY 620	Personality Assessment	3.0
PSY 515	Clinical Case Conceptualization	3.0

Foundations of Intervention

PSY 721	Principles of Psychotherapy	3.0
PSY 722	Theories of Intervention	3.0
PSY 820	Cognitive-Behavioral Therapy	3.0

PSY 897	Clinical Psychology Practicum Seminar	3.0
PSY 899	Practicum	1.0
PSY 999	Internship	4.0

Advanced Professional Training Electives

Select five of the following: 15.0

PSY 552	Proseminar in Diversity
PSY 542	Neuropsychological Assessment
PSY 642	Neuropsychological Case Analysis and Integration
PSY 646	Neuropsychological Assessment of Children and Adolescents
PSY 648	Forensic Assessment I
PSY 649	Forensic Assessment II
PSY 650	Child Psychopathology & Treatment
PSY 720	Health Psychology
PSY 730	Criminal Law and Psychology
PSY 734	Social Science Applications to the Law
PSY 822	Pediatric Psychology
PSY 823	Substance Use
PSY 811	Multilevel Regression
PSY 827	Behavioral Stress Management
PSY 830	Advanced Topics in Health Psychology
PSY 840	Advanced Cognitive-Behavioral Therapy
PSY 854	Psychology of Rehabilitation
PSY 865	Special Topics in Psychology
PSY 828	Weight and Eating Disorders

Total Credits 93.0

Concentrations

Clinical Neuropsychology Concentration

The clinical neuropsychology concentration includes courses, research, and clinical experiences designed to train the students for professional practice in neuropsychology. Clinical neuropsychology involves the application of psychological assessment and intervention to the problems encountered by people with brain injury or illness. The knowledge of brain-behavior functioning and the incorporation of neuropsychological conceptualizations with traditional clinical conceptualizations of functioning are aimed at providing the student with a wider perspective regarding the range of human functioning and disability. The student is able to pursue specific interests in geriatrics, pediatrics, traumatic brain injury, and rehabilitation.

In addition to the core curriculum:

- One neuropsychology practicum (800 hours)
- A neuropsychology-focused thesis and dissertation
- Required classes: Principles of Neuropsychology, Principles of Neuroscience, Neuropsychological Assessment, Case Analysis and Integration
- At least two neuropsychology electives: Models of Memory, Rehabilitation
- Psychology, Advanced Neuropsychology Assessment and Intervention:
- Children and Adolescents, Advanced Neuropsychology Assessment and
- Intervention: The Elderly.

Forensic Psychology Concentration

Forensic psychology involves the application of assessment and intervention techniques to informing legal decision-makers and attorneys on questions in criminal, civil, and family law. Those who concentrate in forensic psychology will be trained in relevant law, behavioral science research, and assessment and intervention approaches with a particular focus on juvenile and criminal issues.

In addition to the core curriculum:

- One forensic psychology practicum (800 hours)
- A forensic psychology-focused thesis and dissertation
- At least two years of research in an area related to forensic psychology
- Required classes: Forensic Assessment I and II, Law and Mental Health
- At least two forensic psychology electives.

Clinical Health Psychology Concentration

Health psychology adopts a broad-based, biopsychosocial perspective in order to: (1) better understand the interplay among behavioral, emotional, cognitive, social, and biological factors regarding health, wellness, and physical disease; (2) promote and maintain wellness and positive physical health; (3) prevent, treat, and rehabilitate illness and disability, and (4) improve the health care delivery system. The health psychology concentration aims to provide specialty training in order to prepare graduate students for academic and/or clinical positions where the primary focus is on physical health problems.

In addition to the core curriculum:

- One health psychology practicum (800 hours)
- A health psychology-focused thesis and dissertation
- Required classes: PSY 720 (<https://nextcatalog.drexel.edu/programadmin/281>) Health Psychology, PSY 815 (<https://nextcatalog.drexel.edu/programadmin/281>) Evidence-Based Assessment and Psychotherapy
- At least three Health Psychology electives

CBT Concentration

Cognitive behavior therapy (CBT) represents a broad family of psychological interventions that are grounded in scientific theories and principles derived from psychology and related disciplines, and that stress the empirical validation of intervention methods. Various theories, principles, models, and techniques fall under the general rubric of CBT, and these approaches have been applied to the full range of human experience, from the assessment and treatment of severe psychopathology and profound developmental delays to primary prevention efforts to enhancing peak performance among athletes.

Common features of the various CBT approaches include a focus primarily on the present rather than the past, an emphasis on parsimony in theoretical explanations, grounding in learning principles (including principles related to how we interpret the world and/or how we related to our own experience), and the emphasis on epistemological empiricism. The CBT concentration aims to provide pre-specialty training in order to prepare graduate students for academic and/or clinical positions in which CBT is a primary focus.

Additional concentration requirements beyond the core curriculum include:

- One CBT-oriented practicum (800 hours)
- A CBT-focused thesis and/or dissertation

- Required classes: PSY 820 (<https://nextcatalog.drexel.edu/programadmin/281>) Cognitive Behavior Therapy, PSY 840 (<https://nextcatalog.drexel.edu/programadmin/281>) Advanced Cognitive Behavior Therapy. Behavioral Stress Management (taken in second year with Personality Assessment taken in third year)
- At least two CBT electives: Child Psychopathology and its Treatment, Seminar in Mind/Body Studies, Pediatric Psychology, Eating and its Disorders, Substance Abuse, and others as offered and approved by the Concentration Head.

For more information on the PhD program requirements, contact the Clinical Psychology PhD Program (<http://www.drexel.edu/psychology/academics/graduate/clinical>).

PhD in Psychology: Applied Cognitive and Brain Science (ACBS)

The Department of Psychology's program in Applied Cognitive and Brain Sciences (ACBS) program is a research-oriented, non-clinical program in experimental psychology and/or cognitive neuroscience. The program places equal emphasis on basic research and the application of scientific principles. Please visit the ACBS website (<http://www.drexel.edu/psychology/academics/graduate/acbs>) more information.

Admissions

Drexel University is seeking applicants with a strong academic record, as evidenced by their GRE scores (a quantitative plus verbal sum of 1250 or greater is desirable), strength of undergraduate institution and GPA (3.5 or greater is preferred). In addition, applicants should have outstanding letters of recommendation (from doctoral-level academic, research oriented psychologists, if possible), high-quality research experience, and include a statement of purpose that convinces Drexel that a potential student is an excellent "match" for one or more of our research groups.

For more details on how to apply to this program, please visit the Graduate Admissions Psychology (http://www.drexel.edu/grad/programs/coas/apply/requirements/p_clps) page.

Curriculum

The PhD program curriculum requires student to earn a minimum of 90.0 credits. Students completing the concentration in Applied Cognitive and Brain Science take all or most of their core courses within the first two years. The third and fourth years, following the receipt of the master's degree, successful passing of the qualifying examinations, and advancement to doctoral candidacy, will be spent in enrichment or specialization courses negotiated with their research supervisor and in research activities.

The following section outlines the courses required for graduation for entering Bachelor's-level students.

First Year

Fall		
BMES 510	Biomedical Statistics	4.0
PSY 512	Cognitive Psychology	3.0
PSY 530	Neuroanatomy and Behavior	3.0
PSY 560	Teaching and Consultation	1.0
Term Credits		11.0
Winter		
BMES 515	Experimental Design in Biomedical Research	4.0

PSY 560	Teaching and Consultation	1.0
PSY 812	Cognitive Neuroscience	3.0
PSY 898	Master's Thesis in Psychology	3.0

Term Credits 11.0

Spring

BMES 518	Interpretation of Biomedical Data	3.0
PSY 560	Teaching and Consultation	1.0
PSY 614	Problem Solving & Creativity	3.0
PSY 865	Special Topics in Psychology	3.0

Term Credits 10.0

Second Year

For the second year and beyond the student's academic schedule will be determined jointly by the student and their primary mentor/advisor. Pre and Post Master's coursework will be partly shaped to suit the student's goals and may be drawn from the following list of courses. (Additional courses may be added as appropriate and with the approval of the program director.)

Term Credits 0.0

Total Credit: 32.0

Sample Electives

PSY 510	Research Methods I	
PSY 511	Research Methods II	
PSY 516	Developmental Psychology	
PSY 517	Social Cognition	
PSY 562	Consciousness	
PSY 610	Data Analysis in Psychology	
PSY 612	Psychology of Human-Computer Interaction Design	
PSY 616	Motivation and Emotion	
PSY 617	Empirical Unconscious Process	
PSY 621	Theories of Personality	
PSY 630	Biological Basis of Behavior and Treatment	
PSY 632	Sensory and Motor Systems	
PSY 648	Forensic Assessment I	
PSY 649	Forensic Assessment II	
PSY 710	Data Analysis II	
PSY 711	Data Analysis III: Advanced Topics	
PSY 712	History and Systems	
PSY 720	Health Psychology	
PSY 730	Criminal Law and Psychology	
PSY 746	Neuropsychological Evaluation and Intervention of Children and Adolescents	
PSY 812	Cognitive Neuroscience	
PSY 840	Advanced Cognitive-Behavioral Therapy	
PSY 865	Special Topics in Psychology	
PSY 898	Master's Thesis in Psychology	
PSY 998	Ph.D. Dissertation in Psychology	

Enrichment Courses from other Disciplines

Computer Science		
CS 510	Introduction to Artificial Intelligence	3.0
CS 530	Developing User Interfaces	3.0

CS 610	Advanced Artificial Intelligence	3.0
Information Systems		
INFO 608	Human-Computer Interaction	3.0
INFO 610	Analysis of Interactive Systems	3.0
INFO 611	Design of Interactive Systems	3.0
Biomedical Engineering and Sciences		
BMES 531	Chronobioengineering I	3.0
BMES 532	Chronobioengineering II	3.0
BMES 551	Biomedical Signal Processing	3.0
BMES 710	Neural Signals	3.0

For more information on the PhD program requirements, consult Department of Psychology's (<http://psychology.drexel.edu>) web site.

Facilities

Computers

Computer resources for student use include more than 20 personal computers (IBM, Macintosh) available in the library and 10 IBM PCs available in the computer laboratory. Both facilities are near the department. In both locations, word processing and biostatistics software is available.

By using computers from their homes or in the library, students have free access to e-mail and a wide array of online services (e.g., the Internet, World Wide Web, and literature databases such as PsychLit and Medline).

Library

Psychology books and journals are located at the Center City Hahnemann Campus library, Moore Campus Library on Henry Avenue, Queen Lane Library on the Queen Lane Campus, and the W. W. Hagerty Library on the University City Campus. The combined holdings represent one of the best psychology libraries on the East Coast.

Equipment

Testing equipment for classroom instruction is available to psychology graduate students. The program also has videotape and audiotape equipment available for classroom instruction and research activities.

Courses

PSY 510 Research Methods I 3.0 Credits

Develops a practical, conceptual understanding of statistical data analysis, the logic of hypothesis testing, and statistical inference. Requires students to identify researchable topics, critically review evidence from prior studies, and prepare proposals for gathering appropriate evidence.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 511 Research Methods II 3.0 Credits

This course will focus on topics regarding the development, execution, analysis, and interpretation of psychotherapy outcome investigations in the clinical psychology across a variety of topical areas (e.g., psychopathology, behavioral medicine).

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: PSY 510 [Min Grade: C]

PSY 512 Cognitive Psychology 3.0 Credits

Emphasizes understanding normal cognition as a basis for recognizing and identifying when abnormality may exist. Covers topics including perception and pattern recognition; attention, learning, and memory; language and communication; and problem-solving and decision-making.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 514 Behavioral Assessment I 3.0 Credits

Reviews the major principles of learning developed by major theorists in psychology.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 515 Clinical Case Conceptualization 3.0 Credits

This course will provide a review of the principles, assumptions, and purpose of clinical case formulation. The course is designed to provide a practical guide of how to integrate various assessment methods such as clinical interviews, direct observation in both analogue and naturalistic settings, applied behavioral analysis, psychological testing, self-report questionnaires, self-monitoring inventories, cognitive assessment, assessment of emotional regulatory processes, interpersonal patterns of behavior, and psychophysiological techniques in order to construct a case formulation leading evidence-based treatment.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: PSY 514 [Min Grade: C]

PSY 516 Developmental Psychology 3.0 Credits

Studies the nature of developmental processes across the life -perceptual, intellectual, emotional, social, and neuropsychological-and the factors influencing or limiting them.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 517 Social Cognition 3.0 Credits

This course will examine the broad domain of social cognition, with special emphasis on its relevance for clinical psychology. The purpose of the course is to present current evidence regarding the influence of social cognitive variables on normal and abnormal behavior.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 518 Social Psychology 3.0 Credits

Studies the causes of social influence and the effects of others on behavior and cognitions of the individual, in such areas as attitude formation and change, social perception, affiliation, and attraction.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 520 Psychopathology 3.0 Credits

Familiarizes the student with existing categories of mental disorders, their diagnosis, and their treatment.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 522 Psychological and Intellectual Assessment 3.0 Credits

Covers the theoretical and practical uses of tests designed to measure intellectual, cognitive, and academic abilities, including administration and interpretation of the most widely used measures.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 524 Professional Issues and Ethics 3.0 Credits

Discusses issues in the delivery of professional psychology, including confidentiality, supervision, standards of practice, and ethics in clinical psychology. Uses case studies to emphasize state and APA regulations.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 530 Neuroanatomy and Behavior 3.0 Credits

Explores the structure and function of the central nervous system, with emphasis on the physiological basis of behavior. Covers topics including the senses, nerve function, cognition and brain structure.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 532 Introduction to Cognitive Modeling 3.0 Credits

This course provides an introduction to computational models of human cognition. As science advances our understanding of the brain and mind, computational models are becoming one of the most important and powerful tools in cognitive science. Cognitive models serve as an explicit theory of how the mind works, but more importantly, they are able to capture and explain the complex interactions among different processes that result in human cognition. This course will examine both classic and modern cognitive models as applied to a variety of domains, including perception, language, memory, motor control, decision-making, and learning from feedback.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: PSY 330 [Min Grade: C] or PSY 512 [Min Grade: C]

PSY 540 Principles of Neuropsychology 3.0 Credits

Introduces the current state of the field and well-recognized and commonly used approaches in the clinical understanding of human brain-behavior relationships.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 542 Neuropsychological Assessment 3.0 Credits

Covers the theory and practical use of major neuropsychological assessment devices, including the Halstead-Reitan and other tests used in contemporary neuropsychology.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 543 Neuropsychological Assess II 3.0 Credits

This course covers principles and practices of neuropsychological testing. Students are taught to administer and interpret major neuropsychological tests and batteries. The focus of the course is on practical knowledge, report writing and neuropsychological clinical practice.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: PSY 542 [Min Grade: C]

PSY 550 Multicultural Perspectives in Psychology 3.0 Credits

Provides an overview of the impact of cultural, ethnic and racial factors on the practice of applied psychology with the goal of developing multicultural competency in clinical practice.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 1 times for 6 credits

PSY 552 Proseminar in Diversity 2.0 Credits

The seminar series will focus on contemporary issues in psychology related to issues of diversity, especially with regard to clinical research and treatment. Seminars will involve a mixture of group discussions, lectures, and guest speakers.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if major is PSY.

PSY 560 Teaching and Consultation 1.0,2.0 Credit

Teaching of Psychology is designed to teach psychology graduate students how to teach within the discipline of psychology. Basic principles of psychology, educational and psychological theories, as well as in class demonstrations will comprise course content, as well as discussion of "vignettes" and challenges that teaching assistants are likely to encounter in their early professional development.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 1 times for 3 credits

Restrictions: Can enroll if major is PSY.

PSY 562 Consciousness 3.0 Credits

A survey of the philosophical, behavioral, and biological basis for conscious thought. Particular attention will be paid to the neural correlates of consciousness and the evolution, development and neuropsychology of the self.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if major is PSY.

PSY 610 Data Analysis in Psychology 3.0 Credits

Deals with the problems confronted by the social scientist in creating and working with a numerical database, including some coverage of the use of computers in calculating both parametric and non-parametric statistics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 611 Computer-Based Research Methods for Psychological Research 3.0 Credits

This course will develop students' ability to use computers for research in psychology. The focus will be on implementing local and online experiments (presenting stimuli, recording responses, etc.) and data formatting, pre-processing, and visualization. The course is designed to develop students' hands-on use of the specific software packages, but will also cover some basic programming concepts. It is meant for graduate students in the behavioral sciences (primarily psychology, but also including business/economics, human-computer interaction, neuroengineering, etc.), and for undergraduate students who intend to pursue graduate study in the behavioral sciences.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 612 Psychology of Human-Computer Interaction Design 3.0 Credits

Explores the psychological aspects of human interaction with computing technology, focusing on the design, evaluation, and redesign of usable and useful human-computer interactions.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 614 Problem Solving & Creativity 3.0 Credits

Introduces current research on problem-solving and creativity. Includes lectures, classroom demonstrations, and exercises.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 616 Motivation and Emotion 3.0 Credits

Considers the behavioral consequences of psychological levels of motivation and emotion.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 617 Empirical Unconscious Process 3.0 Credits

This course is designed to review empirical evidence concerning the assessments and nature of unconscious processes and to consider the relevance of this information for traditional conceptions of the unconscious and for psychotherapy.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 618 Psychology of Loss & Bereavement 3.0 Credits

Covers the study of human attachment and loss, such as death, separation, job loss, and retirement.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 620 Personality Assessment 3.0 Credits

Introduces theories underlying the assessment of personality via the use of objective instruments. Teaches students to administer and interpret a select sample of major personality tests.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 621 Theories of Personality 3.0 Credits

Reviews different theories of personality, including behavioral, psychoanalytic, cognitive, and medical, as they apply to normal human functioning and abnormal behavior.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 624 Behavior Analysis 3.0 Credits

The course will provide an overview of learning theories as applied to both adaptive and pathological behavior. The assumptions underlying learning and conditioning of complex systems will also be presented. A behavior laboratory will provide problem-based projects for students to integrate and analyze their observation.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if major is PSY.

PSY 630 Biological Basis of Behavior and Treatment 3.0 Credits

This course examines neuroanatomy and physiology, with a particular emphasis on the interaction of physiology and anatomy on behavior and clinical syndromes. This course also examines the major classes of psychotropic medications used in clinical practice, with a particular emphasis on empirically supported psychopharmacological treatments and practical considerations relevant to effective clinical and psychopharmacological practice.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 632 Sensory and Motor Systems 3.0 Credits

Examines the physiological function of the sensory and motor systems, from the level of the central nervous system through receptor functions.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 642 Neuropsychological Case Analysis and Integration 3.0 Credits

Reviews the analysis of neuropsychological data, including the integration of historical, interview, behavioral, and formal assessment data.

Emphasizes integrating traditional interview and observation techniques and the ability to conceptualize actual clinical cases in oral and written form.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 646 Neuropsychological Assessment of Children and Adolescents 3.0 Credits

Covers instruments and issues related to the assessment of children and adolescents. Involves both didactic and practical training in psychological and behavioral assessment, test interpretation, and report writing for children with various neurological and psychiatric disorders.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 648 Forensic Assessment I 3.0 Credits

Discusses the use of psychological testing procedures as they relate to testimony in court and legal proceedings. Concentrates on the practical and ethical problems for the clinician involved in clinical practice.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 649 Forensic Assessment II 3.0 Credits

The course focuses on distinguishing forensic assessment from other kinds of assessment performed by mental health professionals, and describing core principles that can serve to guide forensic clinicians. Using frequently identified legal issues as a guide; the course provides a combination of practical training and empirical overview of various relevant topics within the area of forensic assessment. Students may have the opportunity to be involved in a supervised forensic assessment during the period over which the course is taught. Course requirements include writing a report based on hypothetical data, and a paper on a topic approved by the instructor.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: PSY 648 [Min Grade: C]

PSY 650 Child Psychopathology & Treatment 3.0 Credits

This course will explore empirical literature on the diagnosis, assessment, etiology, course, and treatment of various psychological disorders of childhood and adolescence. Students will understand the DSM-IV-TR diagnostic criteria's application to children, symptom presentation in children, and issues of differential diagnosis. Empirically supported treatments for childhood disorders will be examined.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if major is PSY.

PSY 690 Master of Science Research I 3.0 Credits

Students will enroll in a three-term Master's Thesis course under the direct supervision of their mentor. The goal is to foster the development of an independent research project under the supervision of their designated research mentor. This is Part one of the 3-part sequence course.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if major is PSY.

PSY 691 Master of Science Research II 3.0 Credits

Students will enroll in a three-term Master's Thesis course under the direct supervision of their mentor. The goal is to foster the development of an independent research project under the supervision of their designated research mentor. This is Part two of the 3-part sequence course.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if major is PSY.

Prerequisites: PSY 690 [Min Grade: C]

PSY 692 Master of Science Research III 3.0 Credits

Students will enroll in a three-term Master's Thesis course under the direct supervision of their mentor. The goal is to foster the development of an independent research project under the supervision of their designated research mentor. This is Part three of the 3-part sequence course.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if major is PSY.

Prerequisites: PSY 690 [Min Grade: C] and PSY 691 [Min Grade: C]

PSY 710 Data Analysis II 3.0 Credits

The purpose of this course is to acquaint students with the advances statistical tools most frequently used in clinical psychology research. The class will give you a basic theoretical background in the procedure, and it will familiarize you with computer-based analysis.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: PSY 610 [Min Grade: C]

PSY 711 Data Analysis III: Advanced Topics 3.0 Credits

The purpose of this course is to acquaint students with advanced statistical tools most frequently used in clinical psychology research. The class will give you a basic theoretical background on the procedures, and it will familiarize you with computer-based analysis. Emphasis will be placed on the application and interpretation of statistics.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: PSY 610 [Min Grade: C] and PSY 710 [Min Grade: C]

PSY 712 History and Systems 3.0 Credits

Covers the history and various systematic theories of psychology.

Explores the conceptual foundations of psychology from its inception to the present day.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 720 Health Psychology 3.0 Credits

Discusses the role of the clinical psychologist in the medical setting.

Involves didactic and clinical training focusing on behavioral medicine, sleep disorders, hypnosis, consultation-liaison services, and biofeedback.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 721 Principles of Psychotherapy 3.0 Credits

Introduces fundamental clinical interviewing skills.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 722 Theories of Intervention 3.0 Credits

A review of the major theoretical foundations of psychotherapeutic intervention derived from neuroscience, interpersonal, psychodynamic, and learning theories, including contextual/mindfulness-based approaches. The course will translate the various theoretic foundations toward a united approach to assessment and intervention.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Prerequisites: PSY 721 [Min Grade: C]

PSY 730 Criminal Law and Psychology 3.0 Credits

This advanced seminar focuses on the criminal justice system's treatment of mental disordered offenders. Students will learn about the major mental disorders and the ways in which our criminal law accounts for the impact of those illnesses on a defendant's criminal responsibility.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 734 Social Science Applications to the Law 3.0 Credits

This seminar is designed to inform doctoral students in psychology about the usefulness of social science information in the practice and scholarship of law, at the same time indicating the problems and pitfalls of using such information, particularly at the appellate level. Thus, the seminar explores the interplay and conflict between law and psychology and the many ways in which social science research can or should have an influence on legal decision making.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 740 Neuropsychological Evaluation and Interpretation of Adults 3.0 Credits

Covers the neuropsychological assessment of adult patients with brain injury and the subsequent design of reports and rehabilitation programs.

Discusses both assessment instruments and rehabilitation techniques for brain injuries and associated problems. Emphasizes clinical experience with patients.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 746 Neuropsychological Evaluation and Intervention of Children and Adolescents 3.0 Credits

Covers the neuropsychological assessment of younger patients with brain injuries, learning disabilities, or developmental disorders.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 750 Autism Spectrum Disorders 3.0 Credits

In this course we will investigate autism spectrum disorders including characteristics, assessments, systems and family issues, and current theories about the nature and biological basis for autism.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 811 Multilevel Regression 3.0 Credits

Multilevel regression is an advanced regression technique (closely related to hierarchical linear modeling) that was developed to model nested data -- data that contain multiple observations from each source, such as longitudinal data or repeated measures data. This course will provide hands-on training in the application of this method using the R statistical programming language. It will also cover advanced data visualization and data manipulation techniques using R.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if major is PSY and classification is PhD and program is PHD.

Prerequisites: PSY 610 [Min Grade: C] and PSY 710 [Min Grade: C] and PSY 711 [Min Grade: C]

PSY 812 Cognitive Neuroscience 3.0 Credits

This course provides an overview of the field of Cognitive Neuroscience, including a review of sophisticated modeling and neuro-imaging technologies to answer important questions about behavior, the mind and the brain .

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if major is CLPS or major is LWPY or major is PSY.

Prerequisites: PSY 530 [Min Grade: C]

PSY 815 Evidence-Based Psychotherapy 1.0 Credit

This advanced elective course will provide training in scientifically supported psychological assessment and treatment methods. A range of methods (e.g., Problem-Solving Therapy, Gottman marital therapy, etc.) will be presented through book chapters, videos, role plays, etc.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 3 times for 3 credits

Restrictions: Can enroll if major is PSY and classification is PhD and program is PHD.

PSY 820 Cognitive-Behavioral Therapy 3.0 Credits

This course is designed to provide an introduction to cognitive behavior theory and therapy.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 821 Family Therapy 3.0 Credits

Family therapy theories will be reviewed including historically important, current and innovative approaches. In this course students will: 1) learn/integrate concepts and methods of family therapy, 2) appropriately apply these concepts and methods to case material, (3) critically evaluate psychotherapy outcome research relevant to family therapy.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if major is CLPS or major is LWPY or major is PSY and classification is PhD.

PSY 822 Pediatric Psychology 3.0 Credits

The focus of pediatric psychology is the understanding, assessing, and intervening in the relationship between physical and psychological health. In this course students will: (1) learn pediatric psychology theory and practice including professional issues, assessment strategies and intervention approaches, (2) apply concepts to develop appropriate and effective treatment plans for case examples.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if major is CLPS or major is LWPY or major is PSY and classification is PhD.

PSY 823 Substance Use 3.0 Credits

This course examines the effects of drugs on human thinking and behavior. Both illicit (street) and licit (prescription) drugs are examined in an attempt to understand how these drugs produce their physiological and psychological effects. The course will focus on understanding the etiology and epidemiology of drug use and drug abuse/dependence, the pharmacology of psychoactive substances, and empirically supported prevention and intervention strategies.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 824 Psychotherapy with Young Children 3.0 Credits

Reviews the different approaches of intervening with clinical issues in children and families.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 825 Seminar in Mind and Body Studies 3.0 Credits

Through a seminar format, this course will provide an exploration and analysis of the scientific literature concerning health and disease, regarding the integration of biomedical, psychological, social, spiritual, and philosophical domains.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 826 Social Problem Solving and Child Psychopathology 3.0 Credits

This elective course presents an overview of interpersonal cognitive problem solving (ICPS) and their prerequisite skills in normal and diagnostically disturbed populations beginning at age four, and is divided into three sections: Correlation Research; Preventive/Treatment Interventions; and the I Can Problem Solve (ICPS) prevention program.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 827 Behavioral Stress Management 3.0 Credits

This graduate level seminar will provide hands-on teaching of various behavioral stress management strategies. These strategies (e.g., progressive muscle relaxation) are the fundamental skills often part of larger anxiety reduction or stress management protocols for a wide variety of psychological problems. The emphasis of this course is on knowing when to apply these strategies and learning how to competently implement these skills for adult populations. The instructor will model the various strategies and students are expected to role play simulated therapy cases.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 828 Weight and Eating Disorders 3.0 Credits

The purpose of this course is to review psychological determinants of body weight and eating behavior as well as psychological treatments for obesity and eating disorders.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 829 Psychopathy 3.0 Credits

This course focuses on the historical concepts/definitions of psychopathy and the use of various assessment methodologies in clinical and forensic populations; review of comorbidity of psychopathy with other Axis I and Axis II disorders. Students will gain experience in the assessment of psychopathy.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if major is CLPS or major is LWPY or major is PSY.

PSY 830 Advanced Topics in Health Psychology 3.0 Credits

This advanced seminar covers current empirical research in health psychology relevant to theory, epidemiology, and evidence based mental health assessment and intervention, focusing on medical conditions and chronic illnesses that psychologists most often encounter across varied populations, as well as the increased role psychologists play in medical and health settings.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 840 Advanced Cognitive-Behavioral Therapy 3.0 Credits

This course will include didactic training, in class demonstrations, video demonstrations, in-class practice sessions implementing cognitive and behavioral therapy techniques for specific psychological disorders including panic disorder, agoraphobia, obsessive compulsive disorder, depression and post-traumatic stress disorder.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

Restrictions: Can enroll if major is PSY and classification is PhD and program is PHD.

Prerequisites: PSY 820 [Min Grade: C]

PSY 843 Neuropsychological Evaluation of Head Trauma 3.0 Credits

Covers the neuropsychological assessment of patients with head trauma and the subsequent design of reports and rehabilitation programs.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 845 Neuropsychological Evaluation & Intervention of the Elderly 3.0 Credits

Covers the neuropsychological assessment of elderly patients with brain injury, such as primary degenerative conditions (e.g., dementia and Alzheimer's disease).

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 850 Psychology of Disability 3.0 Credits

Reviews disability determination and discusses issues of disability.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 852 Neuropsychological Services Delivery Systems 3.0 Credits

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 854 Psychology of Rehabilitation 3.0 Credits

Discusses issues of psychological assessment and intervention as they apply to rehabilitation.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 865 Special Topics in Psychology 0.5-9.0 Credits

Covers special topics of relevance and significance to the discipline of psychology. May be repeated for credit when topics vary.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated multiple times for credit

PSY 897 Clinical Psychology Practicum Seminar 3.0 Credits

Consistent with APA requirements for accredited programs, the class serves a colloquium function, brings students together to learn about and discuss clinical- and practicum-related issues, and provides a vehicle for information on practice-related issues.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 898 Master's Thesis in Psychology 3.0 Credits

Requires supervised research at the master's level.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 899 Practicum 1.0 Credit

According to APA guidelines, students are required to accumulate clinical training hours during their course of studies. This course is intended to award students credit for each successful year of completed practicum work.

College/Department: College of Arts and Sciences

Repeat Status: Can be repeated 4 times for 4 credits

PSY 998 Ph.D. Dissertation in Psychology 1.0-12.0 Credit

Requires supervised research, including literature research, data collection, and writing of doctoral thesis.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit

PSY 999 Internship 1.0-12.0 Credit

Provides advanced, one-year full-time placement in a clinical setting determined by the clinical director and the student.

College/Department: College of Arts and Sciences

Repeat Status: Not repeatable for credit