

*Drexel University College of Medicine
Neuroscience Graduate Program (MS)*

POLICIES AND PROCEDURES

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A. Course Requirements

The curriculum includes one semester of Drexel Graduate School of Biomedical Sciences and Professional Studies (GSBSPS) Fundamentals of Biochemistry and Cell Biology, two semesters of Early as Professionals (LEAP) and one semester of Responsible Conduct of Research which are shared by all of the biomedical graduate programs, together with a series of programmatic courses specific for neuroscience students. All students must participate in a seminar/discussion course (Topics in Neurobiology) in the second year of their Program. The thesis-based MS will include the completion of an acceptable research project at the Masters level. Electives can be taken at the discretion and advice of the student’s mentor and the Program Director and must be approved by the Program Steering Committee.

B. Curriculum

First Year Fall Semester	
Fundamentals of Biochemistry and Cell Biology	5
Graduate Neuroscience I	2
LEAP I	1
1st Lab Rotation	4
Total Credits:	12
First Year Spring Semester	
LEAP II	1
Medical Neuroscience	6
Graduate Neuroscience II	2
2nd Lab Rotation	4
Total Credits:	13
Second Year Fall Semester	
Neuroscience 3rd Lab Rotation (summer)(optional)	4
Graduate Neuroscience III	4
Neuroscience Thesis Research	9
Topics in Neurobiology (Journal Club)	2
Statistics for Neuro/Pharm Research	2
Total Credits:	21
Second Year Spring Semester	
Advanced Neuroscience	1
Advanced Motor Systems (elective)	4
Neuroscience Thesis Research	9
Responsible Conduct of Research	2
Topics in Neurobiology (Journal Club)	2
Total Credits:	14-18

Students must maintain a 3.0 GPA to remain in good academic standing and to graduate with a MS degree. If a student receives a grade of C or F, he or she may repeat the course once following approval from the Program Steering Committee. Failed courses must be repeated. Programmatic courses in which a student has earned a grade of B- may be remediated to a B upon approval from the course director and the Steering Committee. Students who fail more than one course or earn more than one grade below a B may be dismissed from the Program at the discretion of the Neuroscience Steering Committee.

Laboratory Rotations

M.S. students must undergo at least one and no more than 2 (not withstanding extenuating circumstances) rotations for which the student will be assigned a Satisfactory/Unsatisfactory grade. Each rotation is approximately one semester in length, although there can be flexibility on this, with permission from the Program Director and Steering Committee. The purpose of these rotations is for the student to be matched with the most appropriate Graduate Advisor to supervise the student. The Program Director and Steering Committee will advise each student on the selection of rotations, as well as on the progress and outcome of rotations. Students have the option of arriving early to either complete an entire rotation or a partial rotation in the preceding summer semester. Once a rotation is underway, the student and faculty member must both stay in contact with the Program Director so that any problems that arise can be addressed, and especially if the rotation is proving to be unproductive. M.S. students may be able to select an advisor without doing a second rotation. **Students may NOT finalize rotations without instruction and guidance from the Program Director.** Any student who is unable to identify a mentor willing to take him or her before the start of the second year will not be able to continue in the Program. Please refer to Appendix #1 for a detailed description of the policies and requirements for Laboratory Rotations.

Laboratory rotations are graded on a Satisfactory (S) or Unsatisfactory (U) basis. Students receiving an “S” are rated on a performance scale ranging from Outstanding (1) to Poor (5). A “U” for a lab rotation is reserved for students that do not meet performance requirements, including attendance, of the rotation as stipulated by the Program. A “U” for a laboratory rotation is grounds for dismissal from the Program.

C. Preliminary and Qualifying Exams

MS students are not required to take either the preliminary or qualifying exams. Instead the thesis proposal serves as the measure of competence to continue in the M.S. program.

D. Thesis Advisory Committee

By the end of the summer of first year (August 31), the student, in consultation with his/her advisor, will propose members of the faculty to serve on the Thesis Advisory Committee subject to approval by the Program Director and the Steering Committee. The Advisory Committee consists of at least three voting members who must be Graduate School faculty from the Program; the student and his or her mentor will decide who will serve as Chair of the Advisory Committee. The student’s major advisor is a voting member of the Committee but cannot chair the Committee. The role and responsibilities of the Chair are described in Appendix #2. The following form must be submitted to the Division of Biomedical Sciences (usually after the first committee meeting):

<https://webcampus.drexelmed.edu/BGS/forms/AddedToWebCampusNov27/DissertationCommitteeMembers.pdf>. Once formed, this committee will meet every six months (or sooner) to review the student’s progress. The progress must be described using this form

<https://webcampus.drexelmed.edu/BGS/forms/Dissertation%20Committee%20Meeting%20Report.pdf>, and submitted to the Division of Biomedical Sciences.

E. Thesis Proposal.

1. In lieu of the Qualifying Exam, Master’s degree students will defend their thesis proposal to their Thesis Advisory Committee. The Thesis Proposal document will be submitted by the student either toward the end of the Fall Semester or the beginning of the Spring Semester of the second year. Under special circumstances this can be extended (no more than 12 months, but all proposals for extensions will be given due consideration; approval must be obtained through written request to the Steering

Committee). The Thesis Proposal must be written in the style and within the page limitations of an NIH grant application and handed in 10 working days prior to formal presentation of the Thesis Proposal to his/her Thesis Advisory Committee. Page limit is 6-12 pages (to be decided by the Chair of the student's committee), arial, 11 point, half inch margins, single-spaced. Upon approval of the Thesis Proposal the student will continue with his/her thesis research, culminating on the presentation of the M.S. thesis for defense.

2. At the time of the proposal the student will present a brief (10-15 minute) oral summary of his/her intended research project followed by a detailed question and answer session with the Thesis Advisory Committee.

4. The Thesis Advisory Committee will then reach a decision. If the decision is positive, the student may continue with his/her thesis research. If the decision is negative, the student can re-submit a revised or new proposal in three months. If the Thesis Proposal is rejected a second time, the student will be either dismissed from the Program or recommended for a non-thesis Master's degree.

F. Thesis Defense

1. A written thesis is required with oral defense before the Thesis Advisory Committee. For details regarding the formatting and structure of the thesis document please see the instructions at <https://webcampus.drexelmed.edu/BGS/forms/ThesisManual2017-2018.pdf>

2. It is mandatory that students who are planning on defending their thesis schedule a meeting with the Associate Dean of Academic Affairs who will advise them of all the deadlines and forms necessary to complete the process towards awarding the M.S. Deadlines for submission of completed dissertation/thesis document along with the necessary forms with signatures are posted on the Drexel University Academic Calendar. All the forms are posted at this link:

<https://webcampus.drexelmed.edu/BGS/forms/>

3. A candidate may not present him/herself for the final thesis defense until he or she has completed 18 calendar weeks of residence after satisfactory completion of the Thesis Proposal, and has the approval of his/her major advisor.

4. The thesis defense will take place no less than two weeks and no more than four weeks after the thesis has been distributed to the members of the examination committee, except under written direction of the Steering Committee.

5. The thesis defense will be public. The candidate will be formally introduced by his/her advisor or the Chair of the Committee. The candidate will present a 30-minute seminar on his/her research, followed by questions from and the general audience. After this initial question and answer period, the chair will dismiss the audience. The Advisory Committee will meet in private with the candidate to complete the examination process.

6. The Advisory Committee shall decide upon the merits of the candidate's performance on the thesis defense. The Advisory Committee must unanimously approve the candidate for the M.S. degree and submit its decision to the Director of the Biomedical Sciences Division, who will have final approval.

7. If there is at least one dissenting vote on the Advisory Committee, the candidate is deemed to have failed the thesis defense and will be rescheduled for one re-examination within three months. If a unanimous decision is not reached after the re-examination, the candidate is deemed to have failed and will be dismissed from the Program.

8. A report on each thesis defense whether passed, failed, or recommended for re-examination must be filed by the Chair of the Advisory Committee with the Director of the Division of Biomedical Sciences. The decision(s) of the Advisory Committee may be appealed to the Academic Affairs Committee.

G. Program of Study for Non-Thesis M.S. in Neuroscience

The Program has approved the option of a non-thesis MS degree in which students can earn the degree by taking additional classes and writing a literature review paper as opposed to conducting original laboratory research. The requirements for a M.S. degree without thesis as mandated by the Biomedical Graduate Program Committee of the COM are a minimum of 42 credit hours of course work (with a 3.0 or higher GPA) and preparation of a scholarly paper (Literature Review, 4 credit hours). The detailed course curriculum is listed below

First Year Fall Semester	
Fundamentals of Biochemistry and Cell Biology	5
Graduate Neuroscience I	2
LEAP I	1
1st Lab Rotation	4
Total Credits:	12
First Year Spring Semester	
LEAP II	1
Medical Neuroscience	6
Graduate Neuroscience II	2
Total Credits:	9
Second Year Fall Semester	
Graduate Neuroscience III	4
Topics in Neurobiology (Journal Club)	2
Statistics for Neuro/Pharm Research	2
Principles of Neuropharmacology	3
Total Credits:	11
Second Year Spring Semester	
Advanced Neuroscience	1
Advanced Motor Systems (elective)	4
Responsible Conduct of Research	2
Topics in Neurobiology (Journal Club)	2
Literature Review	4
Total Credits:	9-13

Courses outside of the Program may be taken on the advice and discretion of the Program Director and the approval of the Neuroscience Steering Committee. Credit for a graduate course requires a minimum grade of “B.”

The student must choose a faculty mentor in the first year, no later than June 30. The role of the mentor is to provide guidance in selecting the topic for the scholarly paper, and in helping the student perform the literature search, and in writing the document.

The scholarly paper reviews a topic in detail based on the primary research literature. The body of the paper must be 35-50 double spaced pages (11 pt font, Arial). This page number does not include citations but citations must be provided as well. The following format must be followed:

- Abstract (250 words)
- Body of Paper
 - Introduction – what is the purpose and scope of the review
 - Literature review – review and contrast findings in the field; identify

- unresolved issues and shortcomings of technical approaches
- Summary – what are the key findings of the review
- Conclusion- what gaps in our knowledge or unanswered questions emerge from the review; what are potential future directions for research in this area.

Successful completion of the literature review will be subject to the approval of the mentor/advisor and 2 other faculty members of the Program chosen by the mentor/advisor.

H. Transfer from M.S. to Ph.D.

Successful completion of the M.S. degree is required prior to transfer to the Ph.D. Program. In addition, the applicant must take the Preliminary Exam offered in the beginning of the Spring Semester of the second year. To meet M.S. degree requirements within the timeframe for transition, the student must initiate the transfer process by alerting the Program Director as soon as possible following the completion of the first year in the M.S. Program. After the completion of the Preliminary Exam, a formal request should be made to the Program Director which will include: **1)** A letter stipulating the intent to transfer to the Program including a summary of research experience at Drexel and motivation to pursue a Ph.D.; **2)** original Drexel application materials; **3)** current transcript from Drexel; **4)** a letter of support from the student's research mentor; and **5)** successful completion of the Preliminary Exam documented by the Exam Chair. The Steering Committee will vote on the request based on performance in coursework, research, the Preliminary Exam, and letter(s) of support. If approved by both the Program Steering Committee and the Division of Biomedical Sciences Executive Committee, the transfer will be effective following completion of the M.S. degree. At that time, the student will enter the Program as a third year Ph.D. student. To qualify for candidacy, the Program Director and/or Qualifying Exam Committee Chair will provide the student with a timeline for the Qualifying Exam which may be scheduled for the summer or fall following completion of the M.S. degree.

I. Transfer from other Biomedical Science Programs to the Neuroscience Program

Students from other Biomedical Science M.S. Programs at Drexel can request to transfer into the Neuroscience M.S. Program under consultation with his or her current Program Director and the Neuroscience Program Director. Requests must be submitted to the Neuroscience Program Director and will include: **1)** A letter stipulating the intent to transfer to the Neuroscience M.S. Program, including a description of research experiences to date and reasons for transferring to the Neuroscience Program; **2)** original Drexel application materials; **3)** current transcript from Drexel; and **4)** a letter of support from a Neuroscience Program faculty member. The Steering Committee will vote on the request based on the student's educational background, performance in coursework, letter(s) of support, and research experience, and, on this basis, may recommend the transfer to the Division of Biomedical Sciences Executive Committee. Final approval of the transfer by the Executive Committee of the Division of Biomedical Sciences must be received before the student can enroll in the Neuroscience Program.

J. Neuroscience Steering Committee (NSC)

The NSC is the governing body of the Program. It shall consist of the following voting members:

- (i) Program Director
- (ii) Deputy Program Director
- (iii) Chair of Admissions and Recruitment
- (iv) Chair of Preliminary Exam sub-Committee
- (v) Chair of Qualifying Exam sub-Committee
- (vi) Biology Department Representative

- (vii) Pharm/Phys Department Representative
- (viii) School of Biomedical Engineering and Health Systems Representative

In addition, a Graduate Student Representative will participate in the Steering committee meetings with voice but no vote.

APPENDIX 1

Policy for Laboratory Rotations for First Year Graduate Students

The purpose of this Appendix is to clarify the procedures and goals of rotations for first year MS students in the Neuroscience Program. During orientation, the new students will be given detailed information on the purpose of the rotations and the procedures by which rotations will be implemented.

1. Experience: Rotations are expected to last for the complete duration of the semester, unless extraordinary circumstances necessitate the premature end of the rotation. Coursework is heavier during the first year with the changes to the curriculum, and hence there is less time for students to attempt multiple rotations in a single semester. In consultation with the rotation advisor, students will have necessary time and flexibility for their coursework. While there are several purposes that rotations serve (getting a taste for hands-on research, having a home base and an advisor on academic as well as research matters, gaining a breadth of different laboratory experiences, etc.), the primary purpose of rotations is to make wise and informed choices in the selection of graduate mentors for each student. M.S. students are encouraged to choose a mentor as early as possible during the first year.

2. Exposure: During the rotations, the student and the faculty member should be evaluating each other to make sure that they can establish a healthy, long-term working relationship; the faculty member might wind up being the primary advisor or a member of the student's thesis committee. It is absolutely crucial that all faculty members work in harmony toward the goal of placing each student in the laboratory that is best suited for him or her, and that faculty members do not take a selfish approach toward "recruiting" students to their laboratories. Issues of funding, space, time constraints, and other relevant factors should be taken into account, and all aspects of the decision-making process should be open and transparent to the faculty and student body.

3. Expectation: Rotations should not be treated as mini-thesis projects. By this we mean that projects should not be designed to end up as first-author publications for the student. Also, faculty members are discouraged from designing experiments that would require the student to spend more than one semester in their lab (unless the student has decided to continue in that lab for his/her thesis). Grades for rotations are Satisfactory/Unsatisfactory, and a failing grade should reflect a lack of interest/attendance by the student. However, oversight by the steering committee should prevent students from getting a failing grade. Grades should not reflect the quality of the data and/or the success of the experiment. Expectations are that students will spend roughly 15-20 hours/week in the lab, exams permitting.

4. Execution. During orientation week, the Program will conduct programmatic orientation sessions in which faculty will present their research to the incoming students to assist the incoming students in deciding on potential rotations. The Program Director will consult with faculty members and students to assist in promoting the best possible matches for the first semester, and will finalize these decisions through contact with both the student and the faculty member. In many cases, these arrangements can be made even before students arrive for Orientation. Midway through the first semester, Program faculty will present their research to assist the students in deciding on potential second and third rotations. **Students may NOT finalize rotations without instruction and guidance from the Program Director.**

APPENDIX 2

Thesis Committee Guidelines and Chair Responsibilities

Committee membership is approved by the Program Director.

Chair of committee is nominated by the student and his/her mentor from the committee membership and approved/appointed by the Program Director and Steering Committee.

The Chair of the Committee must not be the student's major advisor or a collaborator on the student's research project and must not have any apparent conflicts of interest related to the publication or funding of the student's project. It is the responsibility of the Chair to:

- i. ensure that there is sufficient balance on the committee to ensure a rigorous and unbiased critique of the student's project and progress.
- ii. ensure that sufficient progress is being made in the student's research and other scholarly endeavors.
- iii. ensure that the research being conducted by the student will culminate in a high quality cutting-edge publishable body of work, and that at least a portion of it is published in a journal respected in the field of major advisor.
- iv. intervene if appropriate progress is not being made, or if there are any conflicts between the student and the major advisor
- v. report to the Program Director if there are any apparent issues or problems with any of the items listed above that can not be resolved with the student and advisor, so that that intervention can occur at the programmatic level.

It is the responsibility of the Chair of the Committee to be well versed in the expectations and guidelines of the Program so that he or she can appropriately take on these duties and responsibilities.

Chair responsibilities:

- Schedule required meetings of the committee in conjunction with the student (initial meeting followed by meetings to discuss progress @ six month intervals)
- Set agenda for the meeting
- Conduct of the meeting
 - Student leaves the room for faculty discussion.
 - Committee reviews student progress, i.e. transcript, publications, abstract submissions, IDP
 - Initial meeting - student presents project proposal (20 minutes) followed by Q & A from the committee. The initial meeting should occur within 6-12 months after the qualifying exam.
 - Progress report meetings – student presents initial aims and documents progress on completed and ongoing aims followed by Q & A from the committee.
 - Chair moderates Q & A session
 - Student leaves the room for faculty discussion moderated by the chair.
 - Student returns and chair summarizes faculty comments and recommendations. Recommendations may include: “approval of project,” “request for revision of project,” “approval of progress,” “modification of project goals depending upon progress.”
- Chair insures that all required forms are signed and completed by student and committee members.

- Meeting follow-up – Chair provides a written summary of the student’s performance and recommended actions including suggestions and changes to the project. Written summary is distributed to the student and all committee members. The student acknowledges in writing to accept the advice/recommendations of the committee.