

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

POLICIES AND PROCEDURES

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I. Getting Started in the MS Neuroscience Program

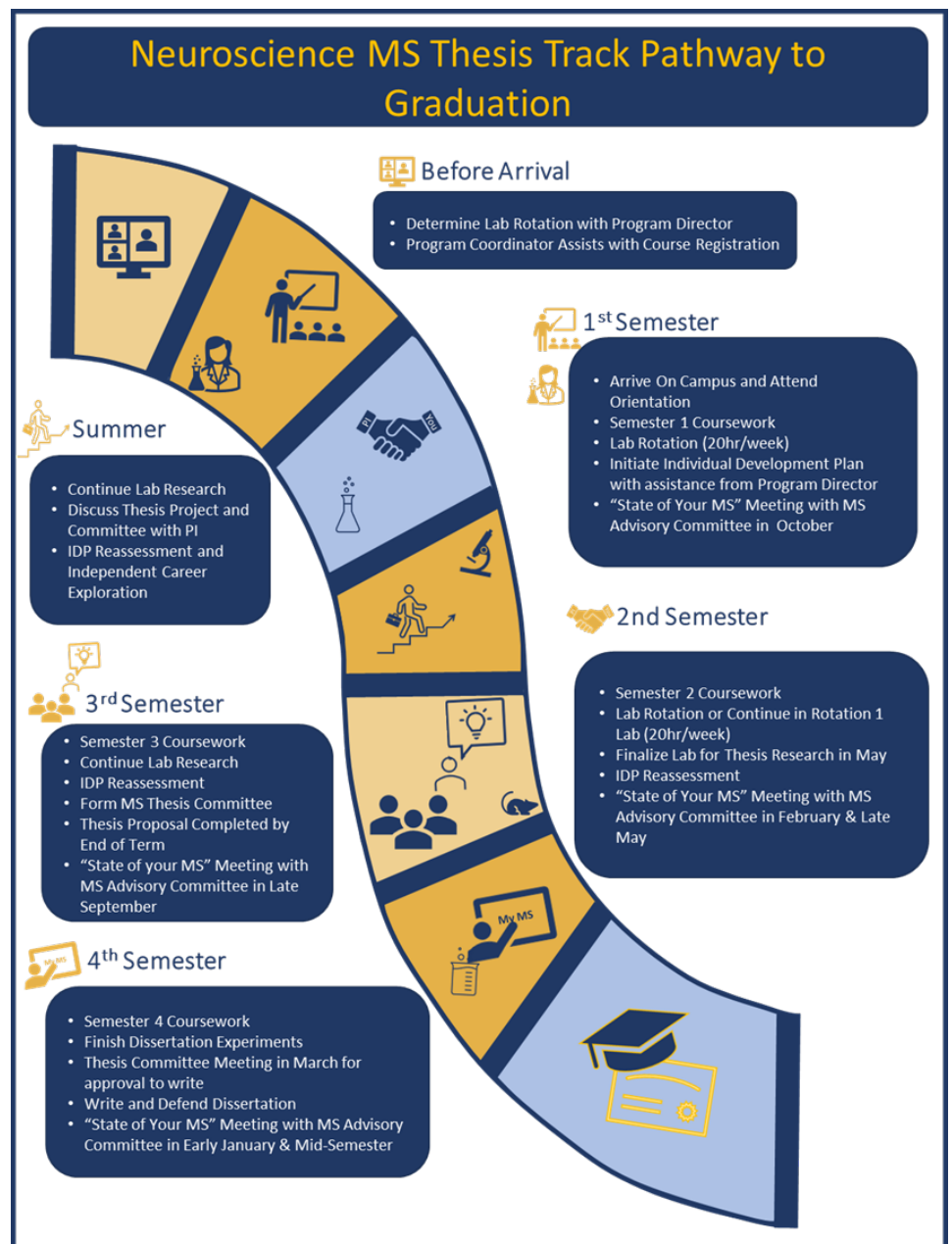
Once the MS student has enrolled in the MS Neuroscience program, the Program Director will reach out via email to set up a virtual meeting with them and a member of the MS student advisory committee to discuss the landscape of the degree program, the MS student’s potential research interests and long-term career goals. This discussion will help guide decisions regarding potential rotation labs.

Detailed descriptions of the course requirements, expectations and milestones for the MS Thesis track are detailed in the sections and appendices below. A non-thesis option is also available. For more information on this option, please contact the MS Advisory Committee, Program Directors and refer to the GSBSPS handbook.

II. Research-Intensive Thesis Track

A. Requirements and Curriculum

The curriculum includes one semester of Drexel Graduate School of Biomedical Sciences and Professional Studies (GSBSPS) Core Principles of Biochemistry and Cell Biology, one semester of Learn Early and Practice (LEAP I), one semester of Learn Early as Professionals (LEAP II) 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 MS Students enrolled in the Thesis track must complete two semester long laboratory rotation courses in the first year and enroll in the Thesis Research course for both semesters of their second year that will culminate in a written thesis document and oral defense. Elective courses can be taken at the discretion and advice of the student’s



faculty mentor and the Program Director and must be approved by the Neuroscience Program Steering Committee.

Curriculum		
First Year Fall Semester 1		
IDPT 533S	Core Principles of Biochemistry and Cell Biology	5
NEUR 508S	*Graduate Neuroscience I	2
IDPT 502S	Learn Early as Professionals I (LEAP I)	1
NEUR 501S	1st Lab Rotation	4
Total Credits:		12
First Year Spring Semester 2		
IDPT 504S	Learn Early and Practice (LEAP II)	1
NEUR 602S	*Medical Neuroscience	6
NEUR 609S	*Graduate Neuroscience II	2
NEUR 502S	2nd Lab Rotation	4
Total Credits:		13
Second Year Fall Semester 3		
NEUR 610S	*Graduate Neuroscience III	4
NEUR 600S	Neuroscience Thesis Research	9
NEUR 520S	Topics in Neurobiology (Journal Club)	2
NEUR 500S	Statistics for Neuro/Pharm Research	2
Total Credits:		12-17
Second Year Spring Semester 4		
NEUR 611S	*Advanced Neuroscience (elective) -OR-	1
NEUR 634S	*Advanced Motor Systems (elective)	4
NEUR 600S	Neuroscience Thesis Research	9
IDPT 500S	Responsible Conduct of Research	2
NEUR 521S	Topics in Neurobiology (Journal Club)	2
Total Credits:		14-17

1. Grade Requirements for Coursework

To remain in good academic standing and to graduate with a MS degree, students in the Neuroscience MS program must maintain a cumulative GPA of 3.00 or higher. Students in the Neuroscience MS program can earn no more than two grades of “C,” “C+,” or “B-” in required courses. Students who fail to meet these standards will be placed on academic probation, and they will work with Program Directors, MS Advisory Committee and Senior Associate Dean of Educational and Academic Affairs for the graduate school to discuss available options that may return the student to good academic standing. Any student who earns a failing grade in any course or withdraws from two or more required courses will be considered for dismissal or be placed on probation and required to repeat the course(s). To be eligible for acceptance into the Neuroscience PhD program, a Neuroscience MS student must earn a B or better in all required courses.

C. Laboratory Rotations

MS Thesis students must complete 2 (not withstanding extenuating circumstances) rotations for course credit. Each rotation is approximately one semester in length. The purpose of these rotations is for the

student to be matched with the most appropriate mentor to supervise the student. The Program Director or designate will advise each student on the selection of rotations, as well as on the progress and outcome of rotations. **Importantly, students may NOT finalize rotations without instruction and guidance from the Program Director.**

Once lab rotation placement has been determined, the student and the research mentor will fill in the **Lab Rotation Intake Form** to set goals and expectations for the rotation experience. As the semester progresses, the student and faculty mentor will perform a mid-rotation evaluation and submit the rotation evaluation via their sharepoint folder. Additionally, the student and faculty mentor must both stay in contact with the Program Director and MS Student Advisory Committee so that any problems that arise can be addressed, and especially if the rotation is proving to be unproductive. Any student who is unable to identify a mentor willing to take them before the start of the second year (mid-August) will not be able to continue in the Thesis MS Track and will be transferred to the Non-Thesis MS Track.

At the end of the first and second laboratory rotation, MS students will be required to present a short, 10 minute “Rotation Talk” to Neuroscience Program Trainees and Faculty about their experience. This is an opportunity to showcase the skills the student acquired and put it into context of a larger research question. Additionally, the student and their mentor will complete a two-part end of **rotation evaluation** of the student’s performance with the student providing a self-evaluation of their performance and the faculty providing their assessment of the student’s performance. The student and faculty member should then have a discussion. Forms should be signed by all required and uploaded to the student’s sharepoint portfolio.

Laboratory rotations are graded on a Satisfactory (S) or Unsatisfactory (U) basis by the faculty mentor. A “U” for a lab rotation is reserved for students that do not meet performance expectations, including attendance, of the rotation as stipulated by the Program. A “U” for a laboratory rotation is grounds for dismissal from the Program.

Please refer to **Appendix #1** for additional details on the policies and requirements for Laboratory Rotation coursework.

D. Selecting A Faculty Mentor and Thesis Advisory Committee

By the end of semester 2, the student, in consultation with the Program Director, will identify a faculty mentor and lab that they will conduct their thesis research. By the end of the summer following the first year (start of Semester 3), the student, in consultation with their mentor, will propose two members of the Neuroscience program faculty to serve on the Thesis Advisory Committee subject to approval by the Program Directors. The Thesis Advisory Committee consists of at least three voting members who must be Graduate School faculty from the Neuroscience Program; The student’s faculty mentor is a voting member of the Committee but cannot chair the committee. The student and their mentor will decide who will serve as Chair of the Thesis Committee. The role and responsibilities of the Chair are described in **Appendix #2**. The **Thesis Committee Membership Form** must be signed and submitted to the program administrator for the Division of Biomedical Sciences, and uploaded to the student’s sharepoint portfolio.

Once formed, this committee will meet for the thesis proposal and thesis defense (or more frequently if necessary) to review the student’s progress on their research. After each meeting, the Committee Chair will prepare a **Thesis Committee Meeting Form** and share it with the student and their committee. Signed forms will be submitted to the program’s administrator in the Division of Biomedical Sciences and uploaded to the student’s sharepoint portfolio.

E. Thesis Proposal

The student, with the mentorship of their advisor, will develop a specific aims page that details their proposed MS thesis research. The format of the specific aims page should be formatted in single-spaced 11 point arial font with half inch margins. Detailed information on how to craft a specific aims page will be outlined by Program Directors at the start of the second year (Semester 3). The document will be distributed to their thesis committee 10 days prior to the formal presentation and defense of their aims to their Thesis Committee. The presentation should be no more than 10-15 minutes and will be followed by no more than a 45-minute question and answer period. Details of the discussion will be curated in the **Thesis Committee Meeting Form** by the thesis committee chair, signed by the appropriate parties, submitted to the program administrator in the Division of Biomedical Sciences, and uploaded to the student's sharepoint portfolio.

F. Thesis Defense

The **Notification of Intent to Defend Thesis Form**, should be completed, signed, submitted to the program administrator in the Division of Biomedical Sciences, and uploaded to the student's sharepoint portfolio by March 1 in Semester 4. At this time, deadlines for submission of completed thesis document along with the necessary forms with signatures are also posted on the Drexel University Academic Calendar which can be found on the Neuroscience Program Website. The thesis defense is comprised of two parts—a written component and an oral component where the student presents their work to their Thesis Committee and the public.

1. **Written Thesis.** The body of thesis must be at least 25 double spaced pages (11 pt font, Arial, 1" margins). This page number does not include citations, but citations must be provided as well. Schematics, figures and tables are encouraged and count toward the page count. For details regarding the formatting and structure of the thesis document please see the instructions in the sharepoint site in the document entitled, **Thesis Manual**. The following format must be followed:

- Title
- Abstract (250 words)
- Body of Thesis
 - Overview—what is the purpose and scope of the research project
 - Introduction and background—review and contrast findings in the field; identify unresolved issues and shortcomings of technical approaches (subheadings are encouraged in this section)
 - Results – what are the key findings of the research project
 - Discussion and Conclusion- what gaps in our knowledge or unanswered questions were filled and what are potential future directions for research in this area.
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The written thesis should be submitted to the student's Thesis Committee for review 10 days before the Oral Defense.

4. The **oral 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 Thesis Committee, except under written direction of the Neuroscience Steering Committee. The oral thesis defense will be public. The candidate will be formally introduced by their advisor or the Chair of the Thesis Advisory Committee. The student will present a 15-minute seminar on their research, followed by questions from the general audience and thesis committee the last week in April of Semester 4.

5. The Thesis Committee shall decide upon the merits of the student’s performance on both components of the thesis defense. The Thesis Advisory Committee must unanimously approve the candidate for the M.S. degree. If there is at least one dissenting vote on the Advisory Committee, the student 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 student is deemed to have failed and will be dismissed from the Program or recommended to complete requirements of a non-thesis MS degree.

6. A written report on the thesis defense whether passed, failed, or recommended for re-examination must be filed by the Chair of the Thesis Committee with the program administrator of the Division of Biomedical Sciences. The forms include: **Graduate Thesis-Dissertation Approval Form and Signature Page, Thesis Defense Completion Form, and the Graduate Program Completion Form-MS and PhD.** All forms can be found on the sharepoint site. The decision(s) of the Thesis Committee may be appealed to the Academic Affairs Committee.

<i>Forms to Be Uploaded To Sharepoint Portfolio MS Thesis Track</i>	
Semester 1	
1.	Rotation 1 Forms
a.	Rotation Intake Form
b.	Mid-rotation Review Form
c.	End of Rotation Student to PI Form
d.	End of Rotation PI to Student Form
Semester 2	
1.	MS Candidate Progress Report and IDP & Signature Form
2.	Rotation 1 Forms
a.	Rotation Intake Form
b.	Mid-rotation Review Form
c.	End of Rotation Student to PI Form
d.	End of Rotation PI to Student Form
Semester 3	
1.	Thesis Committee Membership Form
2.	Thesis Committee Meeting Report Form
a.	Pre-proposal Meeting (If applicable)
b.	Proposal Meeting with outcome
Semester 4	
1.	Thesis Committee Meeting Report Form
2.	Notification of Intent to Defend Thesis Form
3.	Graduate Thesis-Dissertation Approval Form and Signature Page
4.	Thesis Defense Completion Form
5.	Graduate Program Completion Form-MS and PhD

IV. Application for Advanced Standing in Neuroscience PhD Program

MS students interested in pursuing a PhD in neuroscience have the opportunity to apply for admittance to the Neuroscience PhD program with advanced standing. Any student considering this pathway, must alert the Program Director as soon as possible with a hard deadline of August 31 in Fall semester of year 3. A formal application will be submitted via the Slate platform by December 15 of the second year and directly to the Program Director. The application will include: **1)** A personal statement stipulating the intent to pursue a position in the Neuroscience PhD Program with advanced standing including a summary of research experience at Drexel and motivation to pursue a PhD; **2)** original Drexel application materials; **3)** current transcript from Drexel; **4)** a letter of support from the student’s research mentor; and **5)** research rotation evaluations. The Neuroscience program coordinator can assist with the Slate application process.

The Neuroscience Steering Committee will approve or deny the MS student’s application to the Neuroscience PhD program. If approved by the Neuroscience Steering Committee, the request will be submitted to the Division of Biomedical Sciences Executive Committee, the student will be transferred to the Non-Thesis MS track for the completion of their degree. Matriculation into the Neuroscience PhD program would then be effective following completion of the MS degree. At that time, the student will enter the Neuroscience PhD Program as a third year student. To qualify for PhD 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 MS degree.

V. 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 their 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 Neuroscience 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.

VI. 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 (PhD and MS)
- (iv) At-Large Faculty representative from Neurobiology & Anatomy Department
- (v) Faculty representative from outside the Neurobiology & Anatomy Department

In addition, a MS and a PhD Graduate Student Representative will participate in the Neuroscience 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, 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, spending an average of 20 hours/week in the lab. 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 them, 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 their thesis). The **Laboratory Rotation Intake Form** puts forth a series of questions to aid in the generation of goals and expectations of the student and faculty member during the rotation. This form is signed by the student, faculty mentor and program director. Once signed by all parties, the form should be uploaded to the student's sharepoint portfolio. Grades for rotations are Satisfactory/ Unsatisfactory, and a failing grade should reflect a lack of interest/attendance by the student. However, oversight by the Program Director, Master's student advisory committee and Neuroscience 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 an average of 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. **Students may NOT finalize rotations without instruction and guidance from the Program Director.**

5. Evaluation: Laboratory rotations are to be evaluated at the half-way point and end of the term by filling out the **Mid-Rotation Review** and **End of Rotation Review Forms**. The Mid-Rotation Review Form of the student's performance will be completed by the faculty mentor and shared with the student during a face-to-face discussion. The form should then be signed by the student, faculty mentor and Program Director before being uploaded to the student's sharepoint portfolio. The end of rotation review has two forms, one in which the student fills out (End of Rotation Student to PI Form) and one that the PI fills out (End of Rotation PI to Student Form) prior to a face-to-face discussion/exit interview. After the meeting, signed forms should be uploaded to the student's sharepoint portfolio.

APPENDIX 2

Thesis Committee Guidelines and Chair Responsibilities

Committee membership is approved by the Program Director. The chair of committee is nominated by the student and their mentor from the committee membership and approved/appointed by the Program Director and Steering Committee. The **Thesis Committee Membership Form** must be completed, signed and uploaded to the student's sharepoint portfolio.

The Chair of the Committee must not be the student's faculty mentor 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 faculty mentor.
- iv. intervene if appropriate progress is not being made, or if there are any conflicts between the student and the faculty mentor
- 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 faculty mentor, 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 they can appropriately take on these duties and responsibilities.

Additional Chair Responsibilities:

- Schedule required meetings of the committee in conjunction with the student
- Set agenda for the meeting
- Conduct of the meeting
 - Student leaves the room for faculty discussion.
 - Faculty mentor leaves the room for student to discuss any pertinent issues with their committee in the absence of their faculty advisor.
 - Committee reviews student progress, i.e. transcript, publications, abstract submissions, IDP
 - Initial Thesis Proposal Meeting - student presents project proposal (20 minutes) followed by Q & A from the committee.
 - Progress report meetings (as needed)— student presents initial aims and documents progress on completed and ongoing aims followed by Q & A from the committee.
 - Chair moderates Q & A session
 - At the end of each meeting, the 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.

1. **Meeting follow-up** – Chair provides a written summary of the student’s performance and recommended actions including suggestions for potential changes to the project on the **Thesis Committee Meeting Report Form**. The same form is used for the Thesis Proposal Meeting and any additional Progress Report meetings. The written summary is distributed to the student and all committee members, signed as needed and the student uploads the form to their sharepoint portfolio. The student acknowledges in writing to accept the advice/recommendations of the committee.