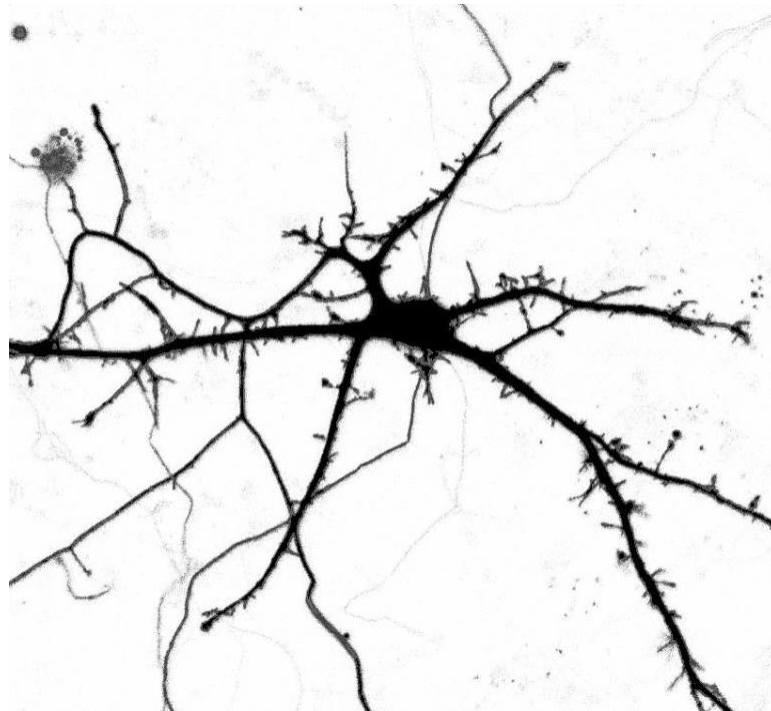




INTERDISCIPLINARY PROGRAM  
**NEUROSCIENCE**  
CENTRAL MICHIGAN UNIVERSITY

# Graduate Program Handbook

## 2022-2023



## Welcome!

The Neuroscience Graduate Program is a research-based interdisciplinary program linking together CMU faculty with interests in Neuroscience. The program's aim is to provide high quality instructional and research experiences for students. Each student works closely with their advisor to conduct original research. Students completing the program will develop the knowledge and research skills necessary for success in further scientific or professional education, or to enter the professional workforce in industry, academia, government laboratories, or other neuroscience-related careers.

This handbook is intended to provide information for Neuroscience graduate students, their advisors, and members of their committee, with respect to the structure and expectations of the program, including M.S. and Ph.D. degree requirements. This handbook serves as a supplement to the CMU Graduate Bulletin, where students can find general information regarding graduate programs at CMU. The latest version of the handbook supersedes older versions and should be used by all students in the program independently of their bulletin year.

Neuroscience graduate program faculty will review and update this handbook every 1-2 years.

*\*\*\*Note: If you entered the program in an academic year prior to 2021-22, your coursework and credit hour requirements may not be the same as those described here. Please consult the CMU graduate bulletin for course, grade and credit requirements for previous years. In some cases, you may still be able to use the 2021-22 bulletin/guidelines; contact the Program Director if you need advice about which bulletin year you should use.*

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Interim Program Director:

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Please call the College of Science and Engineering (989-774-1870) if you would like to make an appointment with Dr. Galarowicz.

Additional information can be found at the Neuroscience Program website:  
<https://www.cmich.edu/colleges/se/neuroscience/Pages/default.aspx>

*\*\*\*Note: As of August 2022, the position of Program Coordinator is not filled. Until the position is filled, please contact the interim Program Director for assistance.*

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## M.S. in Neuroscience

The Master of Science (M.S.) in Neuroscience is designed to provide students with a comprehensive understanding of the fundamentals of neuroscience combined with intensive research training. The program will prepare students for doctoral-level graduate programs or for advanced programs and career options in biomedical and neuroscience-related fields. All students in the program will be actively involved in research with a graduate program faculty advisor. The program is broad, yet flexible enough to develop individual scholarship in the student's area of interest.

To attain the M.S. in Neuroscience degree, students must successfully complete the required coursework, obtain approval of a written thesis, present their thesis research in a forum open to the public, and successfully defend their thesis.

It is the program's policy that all requirements for the M.S. degree be completed within seven years after matriculation.

### **M.S. Degree Coursework Requirements**

The M.S. in Neuroscience requires satisfactory completion of a minimum of 30 semester hours of graduate course work. The student must earn a B or better in core courses, obtain approval of a written thesis, present their thesis research in a forum open to the public, and successfully defend their thesis.

#### **Required Courses I (18 hours)**

NSC 501 Principles of Neuroscience I – 4 credit hours

NSC 502 Principles of Neuroscience II – 4 credit hours

NSC 690 Research Seminar in Neuroscience – taken 4 times, one credit, for 4 credit hours total

NSC 798 Thesis: Design – 3 credit hours

NSC 799 Thesis: Implementation – 3 credit hours

*Note: A minimum of 4 hours of NSC 690 and 6 hours from a combination of NSC 798 and NSC 799 is required.*

#### **Required Courses II (3 hours)**

One of the following:

BIO 500 Biological Statistics – 3 credit hours

PSY 511 Statistics in Psychology – 3 credit hours

#### **Electives (9 hours)**

- To be chosen in consultation with advisor.
- Typically, a combination of research and coursework (may include professional development courses offered for credit, such as SCI740 – Responsible Conduct of Research or NSC790 - Graduate Research Seminar, and others).
- Students need a minimum of 2 credit hours from elective courses at the 600 level.

*\*\*\*Note: Students who enter with a deficiency in a foundational subject area will be expected to make up this deficiency during the first year in the program, often through recommended coursework. The Program Director must approve the student's plan to address a deficiency.*

Agreed upon modifications to the degree program should be submitted by the research advisor via Degree Progress.

## Overview of MS Thesis Requirements

The [Graduate Bulletin](#) outlines University policies relating to the prospectus and thesis.

Information regarding University procedures for thesis or doctoral dissertation preparation is available from the [Office of Graduate Studies](#).

The usual steps are:

- 1) Student develops a project with their research advisor.
- 2) Student forms a thesis committee that will have to be approved by the Program Director. See the “Thesis Committee” section below for required composition of thesis committees.
- 3) Student convenes regularly (at least once a semester) the thesis committee to discuss, fine tune, and approve/disapprove the idea. At the beginning of the first committee meeting, one committee member will become chair of the thesis committee. The chair will guide the rest of the meeting and subsequent meetings.
- 4) Student writes a prospectus and submits it to the thesis committee at least 2 weeks prior to a committee meeting.
- 5) Thesis Prospectus is approved by the committee and the form (DocuSign) is filed with the graduate office and department.
- 6) After approval from the Office of Graduate studies, research is conducted. Student meets with thesis committee twice per year.
- 7) At the end of each academic year, the student will compose a progress report on their coursework and research, including a summary of recommendations from their most recent thesis committee meeting. The student will send this report to their faculty advisor, who will approve and amend this report and submit it to the Neuroscience Program Coordinator.
- 8) Once the student has completed or is close to completing their research project, the student convenes a committee meeting. At this meeting, the committee determines whether the student is ready to write and defend the thesis.
- 9) Written thesis is completed and submitted to the thesis committee at least two weeks prior to the oral defense.
- 10) Public seminar and oral defense of thesis.
- 11) Students are expected to provide the Program and the Office of Graduate Studies with a final, committee-approved version of the thesis.

### M.S. Thesis Proposal / Prospectus

A Prospectus for the M.S. Thesis must be completed during the first year in the program.

Students must complete the following steps for the prospectus forms:

- 1) Write a polished prospectus (see below for details).
- 2) Email thesis committee members to schedule prospectus meeting.
- 3) Email Neuroscience Program Coordinator with a scheduled room/virtual meeting and date and time of prospectus meeting. Students and their advisors are responsible for scheduling the room/virtual meeting.
- 4) At the thesis committee meeting, present the proposal to the committee (see below for details). Then, if satisfied with the prospectus and presentation, thesis committee members sign prospectus form (DocuSign form from the Graduate Studies website is required).
- 5) Fill out prospectus forms (DocuSign) from the Graduate Studies website prior to proposal meeting.
- 6) All graduate students using animals in their research must have IACUC approval for the

use and care of animals before any animal work can begin.

- 7) All graduate students using humans in their research must have IRB approval of their research before any work with human subjects can begin.
- 8) All graduate students using recombinant DNA in their research must have IBC approval of their research before any such work can begin.
- 9) Submit electronic forms, as required.
- 10) Submit completed, signed Prospectus form and a copy of your IRB, IACUC and/or IBC approval letters (if relevant) to the Neuroscience Program Coordinator and the Office of Graduate Studies. A copy of the abstract must also be turned in with the form.

Students may not enroll for more than 3 thesis credits (e.g. NSC 798, NSC 799) until: (1) thesis committee membership has been approved, and (2) the prospectus is approved by the committee, Program Director and the Office of Graduate Studies.

### **Prospectus format and contents**

The prospectus should typically be 1-3 single-spaced pages\*, in the format of a “letter of intent” to a granting agency, and be written according to the following guidelines:

- The prospectus should convey: (1) the motivation/rationale for the research question, (2) the significance of the research question, (3) the experimental approach that will be taken, (4) relevant preliminary data (if available), and (5) the expected results
- The prospectus should show that the student is acquainted with the literature relevant to the research problem.
- The prospectus should demonstrate that the student understands how to apply the scientific method to this problem. It should also explain how and why the chosen experimental approach is appropriate to address the research problem.
- The prospectus should be written by the student, with advice from the research advisor. The advisor should recommend edits and improvements as needed, so the thesis committee receives a polished version of the prospectus.
- The polished prospectus should be submitted to the thesis committee at least 2 weeks prior to the committee meeting.

*\*Note: The prospectus on file with the Office of Graduate Studies must be no more than 2 double-spaced pages. If the prospectus submitted to the thesis committee is longer than this, a summary or portion of the prospectus may be submitted to the Office of Graduate Studies.*

### **Oral presentation of the prospectus**

Students should present a summary of the significance and rationale of the project, the design of the proposed experiments, preliminary data (if available), anticipated outcomes and potential obstacles and limitations.

- A timeline of expected completion of the proposed aims should also be presented.
- Students should plan for their presentation to last approximately 30 minutes.
- During and after the presentation, the committee will ask questions to probe the student’s understanding of the project and the specific area of the student’s research.
- Students will be given ample time to consider and answer questions on their own. If a student has difficulty answering a question, the committee may facilitate the discussion by helping the student walk through an answer. Advisors and other committee members should only answer a question if it is unreasonable for the student to know the answer, corrections to the answer are necessary, or the student is unable to answer with facilitation.
- After the presentation, the student will leave the room, and the committee will discuss the student’s progress academically, intellectually, and experimentally,

along with the student's potential for achieving the MS and the appropriateness of the timeline.

- The committee will also complete a thesis committee meeting rubric (see "Rubrics" section for more information)
- The student will return, then the committee will discuss their evaluations with the student, including strengths to build upon and challenges to address.

### **Annual Progress Reports**

- In May of each year in the program, the student will compose a brief report on their progress in coursework and research, including a summary of recommendations from their most recent thesis committee meeting.
- The student will send this report to their faculty advisor.
- The faculty advisor will approve and amend this report and submit it to the Neuroscience Program Coordinator.

### **M.S. Thesis**

The written thesis should convey:

- 1) the background and significance of the research question,
  - 2) the experimental approach that was taken,
  - 3) data and data analysis,
  - 4) publication-quality figures with appropriate figure legends,
  - 5) a discussion, which includes relating the student's own observations back to the research question at hand and the larger field of research.
- Because of the nature of the Neuroscience program and curriculum, all students should select the "journal article" format for their written thesis. It should still include a comprehensive background and significance of the research question before the "journal article" section and a comprehensive discussion following that section (see appendix for an example of content).
  - If a student only has negative results, the requirements to present and discuss the data in the thesis are the same. In this case, the student should still discuss whether any conclusions can be drawn from the negative results and should thoughtfully explain why experiments did not/might not have worked out as expected.
  - Regardless of the nature of the conclusions drawn from the research, the written thesis should show that the student is knowledgeable regarding the literature relevant to the research problem. It should also demonstrate that the student understands how to design well-controlled experiments, interpret experimental data and draw conclusions based on those interpretations. The student should demonstrate that they understand how their results fit into their field of research.
  - The thesis should be written by the student. The advisor should recommend edits and improvements as needed, so the Thesis committee receives a polished version of the thesis.
  - The polished thesis should be submitted to the thesis committee at least two weeks prior to the committee meeting.
  - If the committee recommends changes to the written proposal, changes must be made and approved prior to awarding the M.S.. If the committee deems the changes to be minor, completed corrections may be approved by the thesis advisor. Otherwise, completed corrections must be explicitly approved by the committee members.

### **Oral presentation and defense of the thesis**

- Students should present a summary of the thesis research project, including

the background, significance, results and conclusions of the research project.

- Students should plan for their presentation to last approximately 30-45 minutes.
- Presentations should be open to the public and advertised.
  - Be sure to communicate the date, time and location of the presentation with the Neuroscience Program Coordinator as soon as they are established with the thesis committee.
  - Students and their advisors are responsible for scheduling the room/virtual meeting.
- Immediately after the presentation, the audience will be able to ask questions. (Students may also elect to take questions during the presentation but are not required to do so.)
- After the audience questions, the defense will become private, with only the student and the committee in the room. During this portion of the defense, the committee will ask questions to probe the student's understanding of the project and the specific area of the student's research. Questions regarding general topics of Neuroscience that relate to the research project or field are also appropriate.
- Students will be given ample time to consider and answer questions on their own. If a student has difficulty answering a question, the committee may facilitate the discussion by helping the student walk through an answer. Advisors and other committee members should only answer a question if it is unreasonable for the student to know the answer, corrections to the answer are necessary, or the student is unable to answer with facilitation.
- After the presentation, the student will leave the room, and the committee will discuss whether the student has demonstrated achievements in their (i) coursework, (ii) research, including level of intellectual involvement in experimental design, (iii) knowledge within their field of research, and (iv) written and oral communication skills that are appropriate for earning an MS in Neuroscience. The **thesis rubric** is used for this discussion and assessment.
- The committee will vote anonymously whether to award the M.S..
- The student will return, then the committee will discuss their evaluations with the student, including suggested edits to the written thesis.
- If the committee does not unanimously approve awarding the degree, the committee will present the student with a plan for improving on identified weaknesses, along with an expected timeline for implementing the plan. When the student and advisor decide that the student is ready, the student will have a second opportunity to present and defend their M.S. thesis in Neuroscience.

## Grades

Faculty and students must notify the Program Director of grade assignments/changes for thesis and dissertation classes like NSC 798 or 898.



## Ph.D. in Neuroscience

The Doctor of Philosophy (Ph.D.) in Neuroscience is designed to give students a comprehensive understanding of the core principles in neuroscience, exposure to the breadth of the field of neuroscience, and research training that will prepare students to be competitive for obtaining positions in academia, industry, or government. Foundational coursework is completed during the first two years, and students are actively involved in research with a program faculty advisor throughout their training. Each student's research will lead to at least one published first-author paper and a dissertation.

Upon successful completion of the required core courses and defense of a dissertation research proposal, students will advance to candidacy for the Ph.D. To receive the Ph.D., students must complete the remaining course requirements, publish at least one first-author manuscript\*\*\*, obtain approval of a written dissertation, present their dissertation research in a forum open to the public, and orally defend the dissertation.

*\*\*\*Note: Ph.D. students are expected to be first author on a peer-reviewed research article. However, upon approval of the dissertation committee, a significant body of publication-ready original research may substitute for the publication requirement. In this case, the work completed should be equivalent in quality and scope to that generally needed for a publication.*

### **Ph.D. Coursework Requirements**

The Ph.D. in Neuroscience requires a minimum of 61 semester hours of graduate work and a doctoral dissertation. The student must earn a B or better in the required courses.

#### **Required Courses I (24 hours)**

NSC 501 Principles of Neuroscience I – 4 credit hours

NSC 502 Principles of Neuroscience II – 4 credit hours

NSC 690 Research Seminar in Neuroscience – taken 4 times, one credit, for 4 credit hours total

NSC 898 Doctoral Dissertation: Design – 1-12 credit hours

NSC 899 Doctoral Dissertation: Implementation – 1-12 credit hours

*Note: A minimum of 4 hours of NSC 690 and 12 credit hours from the combination of NSC 898 and NSC 899 is required. In addition to course work, a student must complete an oral examination over the dissertation.*

#### **Required Courses II (3 hours)**

One of the following:

BIO 500 Biological Statistics – 3 credit hours

PSY 511 Statistics in Psychology – 3 credit hours

(Or equivalent, if pre-approved by the Program Director)

\*Students entering with equivalent training in statistics may replace this course with an elective.

#### **Electives (34 hours)**

- To be chosen in consultation with advisor.
- Typically, a combination of research and coursework (may include professional development courses offered for credit, such as SCI740 – Responsible Conduct of Research or NSC790 - Graduate Research Seminar, and others).
- Elective choices should ensure that the student fulfills the University requirements for courses at or above the 600 and 700 levels. PhD students must complete a minimum of 50 hours of course work at the 600- level or above, with at least 15 hours at the 700 level or above, independent of thesis/dissertation credits.

*\*\*\*Note: Students who enter with a deficiency in a foundational subject area will be expected to make up this deficiency during the first year in the program, often through recommended coursework. The Program Director must approve the student's plan to address a deficiency.*

Students may not enroll for more than 6 dissertation credits until: (1) dissertation committee membership has been approved, and (2) the dissertation research proposal is approved by the committee, the Program Director, and the Office of Graduate Studies.

Agreed upon modifications to the degree program should be submitted by the research advisor via Degree Progress.

## **Overview of PhD Dissertation Requirements**

The [Graduate Bulletin](#) outlines University policies relating to the prospectus and dissertation.

Information regarding University procedures for thesis or doctoral dissertation preparation is available from the [Office of Graduate Studies](#).

The usual steps are:

- 1) Student develops a project with their research advisor.
- 2) Student forms a dissertation committee that will have to be approved by the Program Director. The Program Director will approve dissertation committees. The committee should be formed as soon as possible after starting the program.
- 3) Once the dissertation committee has been formed and approved, student convenes regularly the committee to discuss, fine tune, and approve/disapprove their research idea. At the first committee meeting, one committee member will become chair of the committee. The chair will guide the rest of the meeting and subsequent meetings.
- 4) The student is expected to meet with their committee 1-2 times per year prior to the qualifying exam.
- 5) At the end of each academic year, the student composes a report on their progress in coursework and research, including a summary of recommendations from their most recent dissertation committee meeting and the progression rubric (see appendix). The student sends this report to their faculty advisor, who will approve and amend this report and submit it to the Neuroscience Program Director.
- 6) Student writes a dissertation proposal for dissertation committee approval, typically during the second year in the program. The proposal is submitted to the committee at least 2 weeks prior to the committee meeting.
- 7) Student convenes the committee to defend the dissertation proposal. This committee meeting serves as the qualifying examination for advancement to candidacy for the Ph.D.
- 8) Doctoral Dissertation Prospectus form is filed with the graduate office and department. Student advances to candidacy for the Ph.D.
- 9) Dissertation research is ongoing. The student meets with the dissertation committee 1-2 times per year.
- 10) Once the student has completed or is close to completing their research project, the student convenes a committee meeting. At this meeting, the committee determines whether the student has permission to begin writing the dissertation and schedule a defense date.
- 11) Once the student is given permission to write and defend the dissertation, an "outside" faculty member is added to the committee, for inclusion at the defense of the dissertation. See the section on committees below for more information.
- 12) Written dissertation is completed and submitted to the dissertation committee at least

two weeks prior to the oral defense.

13) Public seminar and oral defense of dissertation

14) Students are expected to provide the Program with a final, committee-approved version of the dissertation.

### **Advancement to candidacy for the Ph.D.**

Advancement to doctoral candidacy is based upon:

- 1) Satisfactory grades (i.e., maintaining a minimum 3.0 grade point average).
- 2) Completion of the required core courses with at least a B in each course or passing the comprehensive examinations for these courses with a B or better. Candidacy can occur even if all 4 credits of NSC 690 are not completed at the time.
- 3) A dissertation proposal (see below for details), approved by the dissertation committee.
- 4) Oral defense of the dissertation proposal to the dissertation committee.

### **Dissertation Proposal**

Students must complete the following steps for the dissertation proposal:

- Email dissertation committee members to schedule a meeting.
  - a. The written proposal must be distributed to the committee at least 2 weeks prior to the meeting.
- Email Neuroscience Program Coordinator with a scheduled room/virtual meeting and date and time of prospectus meeting. Students and their advisors are responsible for scheduling the room/virtual meeting.
- Fill out prospectus forms (DocuSign) from the Graduate Studies website prior to proposal meeting.
- All graduate students using animals in their research must have IACUC approval for the use and care of animals before any animal work can begin.
- All graduate students using humans in their research must have IRB approval of their research before any work with human subjects can begin.
- All graduate students using recombinant DNA in their research must have IBC approval of their research before any such work can begin.
- At the dissertation committee meeting, present the proposal to committee (see below for details). Then, if satisfied with the prospectus and presentation, thesis committee members sign prospectus form (DocuSign).
  - a. If the committee recommends changes to the written proposal, changes must be made and approved by the dissertation advisor prior to advancement to candidacy.
  - b. Major changes must be approved by the committee members, but minor changes can be approved by the research advisor.
  - c. It is the responsibility of the research advisor and committee members to clearly communicate their expectations regarding the prospectus.
- Submit completed, signed Prospectus form and a copy of your IRB, IACUC and/or IBC approval letters (if relevant) to the Neuroscience Program Coordinator and the Office of Graduate Studies. A copy of the abstract must also be turned in with the form. A copy of the "Specific Aims" page must be turned in with the form and will serve as the prospectus on file with the Office of Graduate Studies.

### **Dissertation proposal format and contents**

The written dissertation proposal should be prepared in the format of an NIH F31 fellowship application (or a different format if pre-approved by the director of the program).

- The specific sections of the fellowship application should be: Specific Aims (1 page),

Research Strategy (up to 6 pages), and References.

- If a student identifies another fellowship opportunity for which they intend to apply, the committee may approve an alternate format and notify the Program Director, provided the length and content are comparable to the F31 application guidelines.
- The proposal should convey: (1) the motivation/rationale for the research question, (2) the significance of the research question, (3) the experimental approach that will be taken, (4) preliminary data if available, (5) the expected results and (6) potential obstacles / limitations and alternative approaches.
- The proposal should show that the student is acquainted with the literature relevant to the research problem. It should also demonstrate that the student understands how to apply the scientific method to this problem. It should also explain how and why the chosen experimental approach is appropriate to address the research problem.
- The proposal should be written by the student, with advice from the research advisor. The advisor should recommend edits and improvements as needed, so the dissertation committee receives a polished version of the proposal.
- The polished proposal should be submitted to the dissertation committee at least 2 weeks prior to the committee meeting.
- Students are strongly encouraged to incorporate the dissertation committee's recommendations and submit their proposal to NIH or another funding agency or foundation.

### **Oral presentation of the proposal**

- Students should present a summary of:
  - 1) the significance and rationale of the project,
  - 2) the design of the proposed experiments,
  - 3) preliminary data (if available),
  - 4) anticipated outcomes, and
  - 5) potential obstacles and limitations.
- A timeline of expected completion of the proposed Aims should be presented.
- Students should plan for their presentation to last approximately 30-45 minutes.
- During and after the presentation, the committee will ask questions to probe the student's understanding of the project and the specific area of the student's research. Questions regarding general topics of Neuroscience that relate to the research project or field are also appropriate.
- Students will be given ample time to consider and answer questions on their own. If a student has difficulty answering a question, the committee may facilitate the discussion by helping the student walk through an answer. Advisors and other committee members should only answer a question if it is unreasonable for the student to know the answer, corrections to the answer are necessary, or the student is unable to answer with facilitation.
- After the presentation, the student will leave the room, and the committee will discuss the student's progress academically, intellectually, and experimentally, along with the student's potential for achieving the Ph.D. and the appropriateness of the timeline. The appropriate Rubric should be used to guide the discussion (see "Rubric" section below for more information).
- The committee will vote anonymously whether to advance the student to candidacy for the Ph.D.
- The student will return, then the committee will discuss their evaluations with the student, including strengths to build upon and challenges to address.
- If the committee does not unanimously approve advancement, the committee will present the student with a plan for improving any identified weaknesses. Then the student will have up to 6 months to implement the plan. When the student and advisor decide that the student is ready, the student will have a second opportunity to present and defend their

proposal in order to advance to candidacy.

### Annual Progress Reports

- At the end of each academic year, the student will compose a report on their progress in coursework and research, including a summary of recommendations from their most recent thesis committee meeting and the rubric.
- The student will send this report to their faculty advisor.
- The faculty advisor will approve and amend this report and submit it to the Neuroscience Program Coordinator.

### Ph.D. Written Dissertation

- The written dissertation is a **multi-chapter document** that should convey:
  - 1) the background and significance of the research question,
  - 2) the experimental approach that was taken and rationale for the approach,
  - 3) data and data analysis,
  - 4) publication-quality figures with figure legends,
  - 5) a thoughtful and thorough discussion of the results and how they relate to both the research question and the larger research field.
- Because of the nature of the Neuroscience program and curriculum, all students should select the “journal article” format for their written dissertation. It should still include a comprehensive background and significance of the research question before the “journal article” section and a comprehensive discussion following that section (see appendix for an example of content)
- The written dissertation should show that the student is knowledgeable regarding the literature relevant to the research problem. It should also demonstrate that the student understands how to design well-controlled experiments, interpret experimental data and draw conclusions based on those interpretations. Importantly, the student should demonstrate that they understand how their results fit into their field of research.
- The dissertation should be written by the student. The advisor should recommend edits and improvements as needed, so the committee receives a polished version of the dissertation.
- If a student has a *published/accepted peer-reviewed first-author research manuscript that was written by the student*, the manuscript may serve as a chapter in the dissertation. Generally, a student also has acquired data that is not included in a manuscript, which would then be discussed in one or more separate chapter(s).
- The polished dissertation should be submitted to the dissertation committee at least two weeks prior to the committee meeting.
- If the committee recommends changes to the written dissertation, changes must be made and approved prior to awarding of the Ph.D. If the committee deems the changes to be minor, completed corrections may be approved by the dissertation advisor. Otherwise, completed corrections must be approved by the committee members.

### Oral presentation and defense of the dissertation

- The student should communicate with the Neuroscience Program Coordinator as soon as a date and time are established so the seminar can be adequately advertised. Students and their advisors are responsible for scheduling the room/virtual meeting.
- Students should present a summary of their research project, including the background, significance, results, interpretations, and conclusions of the research project.
- Students should plan for their presentation to last approximately 45-50 minutes.
- The presentation must be open to the public and advertised. The public will be permitted to ask questions immediately after the presentation. The student may choose

whether to allow questions during the presentation or only after the presentation.

- After the public questions, the defense will become private, with only the student and the dissertation committee in the room. The committee will ask additional questions to probe the student's understanding of the project and the specific area of the student's research. Questions regarding general topics of Neuroscience that relate to the research project or field are also appropriate.
- Students will be given ample time to consider and answer questions on their own. If a student has difficulty answering a question, the committee may facilitate the discussion by helping the student walk through an answer. Advisors and other committee members should only answer a question if it is unreasonable for the student to know the answer, corrections to the answer are necessary, or the student is unable to answer with facilitation.
- After the presentation, the student will leave the room, and the committee will discuss whether the student has demonstrated achievements in their: (i) coursework, (ii) research, (iii) knowledge within their field of research, (iv) written and oral communication skills, (v) ethical conduct of research, and (vi) intellectual independence that are appropriate for earning a Ph.D. in Neuroscience. The dissertation rubric is used for the discussion.
- The committee will vote anonymously whether to award the Ph.D.
- The student will return, then the committee will discuss their evaluations with the student, including suggested edits to the written dissertation.
- Sometimes the committee will choose to ask the student to answer additional questions after the discussion. The committee may do so either prior to or after voting, as needed.
- If the committee does not unanimously approve awarding of the degree, the committee will present the student with a plan for improving any identified weaknesses and an expected timeline for implementing the plan. When the student and advisor decide that the student is ready, the student will have a second opportunity to present and defend their dissertation.

## Grades

Faculty and students must notify the Program Director of grade assignments/changes for thesis and dissertation classes like NSC 798 or 898.

## **Financial Support for Students**

### **Graduate Assistantships through the Neuroscience Program**

Graduate Assistantships (GAs) are awarded by the Neuroscience Program. Prior to starting in the program, students will be notified if they are offered a GA in a letter from the Program Director. Students who are awarded GAs can be supported for up to 2 years for the M.S. and for up to 5 years for the Ph.D., contingent on demonstrated reasonable progress in the program (including submission of all required paperwork in a timely manner).

Graduate Assistant benefits include a stipend plus remission of fees and tuition. For full-time graduate assistants, tuition will be waived for up to 20 credits per academic year, including 10 credits during the summer. A student may register for more credits than the tuition remission schedule allows; however, the student will be responsible for the additional tuition.

Graduate Assistant appointments require that students maintain a 3.0 GPA in graduate coursework and reasonable progress with their research project. GAs must register and maintain a minimum of six semester hours of graduate credit at CMU during both fall and spring semesters. GAs with summer appointments must register for and maintain a minimum of one hour of graduate credit during each summer session at CMU.

### **Additional resources from the Office of Research and Graduate Studies**

Descriptions and application forms are found on the ORGS website at [Graduate Student Forms](#).

### **Graduate Fellowships from the Office of Graduate Studies**

The Office of Graduate Studies may award Graduate Fellowships on a competitive basis to students with outstanding academic records.

### **Dissertation Research Support**

The Office of Graduate Studies may provide small grants for dissertation-related costs.

### **Publication and Presentation Grants**

Graduate Student Publication and Presentation Grants may be awarded to assist graduate students whose research is accepted for publication or presentation at the state, national, or international level.

### **Additional Support from the Neuroscience Program**

- When sufficient funds are available, the Program may support student presentations, publications, or research.
- Students should check with the Neuroscience Program Coordinator and get approval from the Program Director before they apply for an award from ORGS or external fellowship to see whether matching funds from the Neuroscience Program are available. Matching funds will not be awarded unless the Neuroscience Program Coordinator and Director are contacted prior to submission of the application. Please allow for at least three business days if a signature from the Director is needed.

## Responsibilities of Graduate Students

As a graduate student in the Neuroscience program, you're making a commitment to devote the time and energy needed to engage in research and write a thesis or dissertation. Your research advisor has a right to expect substantial effort, initiative, respect and receptiveness to suggestions and criticisms. As a graduate student, you must accept the rules, procedures and standards in place in the program and at Central Michigan University.

*Ultimately, you are responsible for your success as a graduate student!*

**Expectations of graduate students include the following:**

### **Academics and Course Registration**

- Complete required courses, maintaining a cumulative grade point average of a B (3.0) or better, and obtain a B or better in required courses. Grades below a C do not count toward the degree.
- Maintain the required number of credits if you are supported by a Graduate Assistantship: at least 6 credits per semester for fall and spring, and at least 1 credit during the summer.
- Maintain registration throughout the program, and (for international students) ensure that study permits and (where applicable) employment authorization documents are kept up to date.
- Meet regularly with your advisor to select courses and plan your course schedule.

### **Research**

- Make a commitment and show dedicated efforts to gain the background knowledge and skills needed to pursue your research project successfully. Read and stay up-to-date on the literature in your field of research.
- In conjunction with your research advisor, develop a plan and timetable for completion of all stages of your thesis project, adhere to a schedule and meet appropriate deadlines.
- Engage in full-time research, including over the summer, based on a schedule set with your faculty research advisor.
- Attend departmental/program seminars and other relevant presentations and functions.
- Meet with your research advisor when requested and report fully and regularly on progress and results.
- Maintain a detailed lab notebook with all methods, results, and other relevant information. The lab notebook must be left in the lab after graduation.
- Give serious consideration to the advice and feedback received from your research advisor and other members of your thesis committee.
- Keep your workspace clean, tidy, safe and healthy.
- Show tolerance and respect for the rights of others.
- Be thoughtful and reasonably frugal in using resources provided by your research advisor and the University, and assist in obtaining additional resources for your research or for other group members where applicable.
- Participate in preparation of manuscripts and manuscript revisions which present your data, as requested by your advisor, even after you have graduated and received your degree.
- Apply for funding to support your research and travel to conferences



- Become an independent, critical thinker!

### Lab Safety Training

- Before working in the lab, you must:
- Consult your research advisor for a list of trainings you need to complete.
- Complete all required [Lab Safety training](#).
- Do not work with animals or human subjects until you have received written approval from the IACUC or IRB to do so. All animal and human subject work must adhere to approved IACUC and IRB protocols.
- In addition, refresher training must be completed in a timely manner, as required by the Office of Lab Safety, IACUC and IRB.
- All researchers must follow established protocols in all research areas.

### Inclusiveness and Non-Harassment Policies

- Become familiar with CMU's policies and resources through the [Office of Civil Rights and Institutional Equity](#).
- Conform to OCRIE's policies prohibiting acts of discrimination or harassment based on age, color, disability, ethnicity, gender, gender expression, gender identity, genetic information, height, marital status, national origin, political persuasion, pregnancy, childbirth or related medical conditions, race, religion, sex, sex-based stereotypes, sexual orientation, transgender status, veteran status, or weight.
- Conform to OCRIE's policies prohibiting sexual misconduct. Note that CMU faculty are "responsible employees" which means that they are required to report any sexual misconduct that they learn about.

### Program and University Requirements

- Submit prospectus of thesis/dissertation research according to deadlines outlined above. (M.S. students typically submit their prospectus in Year 1; Ph.D. students typically submit their proposal/prospectus Year 2, but may submit their prospectus in Year 1).
- Submit other necessary forms in a timely manner.
- Check Degree Progress to make sure that courses are being appropriately categorized and counting toward your degree. Ask your advisor to make any changes required.
- Conform to university, Faculty, and graduate program requirements, including those related to research ethics, deadlines, dissertation or thesis style, and conflict of interest.
- Follow the university's policy regarding ownership of intellectual property.

### As You Reach the End of Your Program

- When your degree program requirements have been met, terminate your work, clean up your workspace, and inventory your reagents and samples that are still useful for the lab.
- Return borrowed materials to your research advisor, graduate program, library or reading room, etc., when your project is finished or when return is requested.
- Your lab notebook must remain in the lab when you leave.

***The following suggestions can make your life a lot easier:***

- *Review the literature regularly and keep your literature survey up-to-date.*
- *Maintain exemplary records of your experimental/theoretical work (so that others can replicate your results).*
- *While your research advisor is required to be reasonably available for consultation, it is your responsibility to keep in touch with your research advisor.*
- *Make yourself available to your research advisor for regular meetings at mutually acceptable times.*

**Faculty Advisors and their Responsibilities**

Upon admission, each student is assigned a faculty advisor who will serve as the student's research and academic advisor for the rest of the student's enrollment in the program. In exceptional circumstances, a student may request a different advisor by submitting a written request to the Neuroscience Program Director.

To qualify as Neuroscience graduate faculty, individuals must meet the current standards for Graduate Faculty as defined by CMU's Office of Research and Graduate Studies, be approved by ORGS as full/regular graduate faculty, and be an active member of the Neuroscience program faculty with Graduate Faculty status. This requires that the faculty member maintains an active research program in the field of Neuroscience, with recent evidence of peer-reviewed publications.

Faculty advisors are expected to facilitate and optimize student progress towards attainment of the graduate degree. Advisors should promote a partnership with graduate students that exemplifies the best aspects of scientific cooperation, intellectual growth and scholarly rigor.

In May of each school year, the student will compose a report on their progress in coursework and research, including a summary of recommendations from their most recent thesis/dissertation committee meeting. The student will send this report to their faculty advisor. The faculty advisor will approve and amend this report and submit it to the Neuroscience Program Director.

Both the student and the advisor are responsible for maintaining a successful mentoring relationship. It is very important that a good channel of communication be open between the advisor and student. Problems and questions should be brought to the attention of the advisor as soon as possible.

**Responsibilities of the Faculty Advisor:**

- Meet regularly with graduate students to assess progress
- Discuss overall program of study and course requirements with graduate students
- Discuss expectations regarding thesis research projects, timetable, publication, etc.
- Help graduate students choose a thesis/dissertation committee
- Acquaint students with the laboratory and its policies
- Assist with experimental protocols, data analysis, scientific writing, and seminar preparation
- Assist in obtaining funding for graduate student research
- Provide feedback on proposals, manuscripts, posters, etc. in a timely manner

- Encourage students to attend professional meetings
- Ensure that necessary research equipment is available and in working order
- Foster a safe and professional laboratory work environment

More detailed information on some of these responsibilities follows:

Facilitation and planning of coursework: Faculty advisors shall provide students with advice on selection of courses that will both fulfill their degree requirements and enhance their mastery of a developing area of expertise. Expectations for each student shall be clearly mapped, including course work requirements, research seminars, laboratory meetings, examinations, thesis proposal, and thesis or dissertation. The faculty mentor shall inform the student realistically of the appropriate amount of time required for service and completion of these expectations.

Evaluation of progress: Faculty mentors shall evaluate student progress and performance in a regular and informative way. Evaluations shall explicitly inform students about their performance in relation to expectations for normal progress, and for timely degree completion and placement after graduation. Advisors shall prioritize student work assignments and projects towards successful completion of degree requirements and provide guidance that will deflect distractions and focus student efforts on important objectives.

Organization of Thesis/Dissertation Committee: Faculty advisors shall provide guidance on the selection and assembly of the committee. Faculty advisors shall ensure that students schedule regular committee meetings, that the student's ongoing progress is discussed, and that any barriers to the student's progress that may have arisen are detailed and resolved.

Promotion of scholarly and intellectual development: Faculty advisors shall help the student develop and practice scholarship, intellectual curiosity, and the generation of valid and significant results. The faculty advisor shall guide the student in asking important questions and help them devise hypotheses and methods to test them. The faculty advisor shall help the student develop organizational, interpretative, analytic, quantitative, and laboratory skills appropriate for excellence in their academic discipline. The faculty advisor shall educate the student about research ethics and record keeping and promote ethical behavior in the laboratory.

Publication and dissemination of results: The faculty advisor shall take primary responsibility for developing the student's skill in writing and presenting results. The faculty advisor shall instruct the student on the proper methods of drafting, assembly, illustration, referencing, submission, and revision of manuscripts. The faculty Advisor shall inform the student of the criteria for authorship and of the hierarchy among authors on a manuscript or presentation.

Lab environment: Faculty advisors will work with lab members to create a lab environment that is physically and emotionally safe. Advisors will expect lab members to follow reasonable safety standards recommended by the Office of Laboratory and Field Safety. Advisors will also foster an inclusive environment where discrimination, harassment, and/or sexual misconduct by any lab member, including the advisor, are not tolerated.

## Dissertation/Thesis Committee

A Dissertation/Thesis Committee is formed to provide guidance and advice throughout the student's graduate career.

The student selects the committee members, in consultation with their Advisor. In addition to the advisor, the committee must consist of at least two faculty members with CMU graduate faculty status. *At least two committee members must be Neuroscience Faculty.* The advisor can count as one of the two Neuroscience faculty.

The thesis/dissertation committee will:

- meet regularly (at least 1-2 times per year) to discuss the student's progress
- conduct the oral defense of the dissertation/thesis proposal
- approve written thesis/dissertation proposal
- conduct the oral defense of the dissertation/thesis
- approve written thesis/dissertation

**For Ph.D. students, a new committee member is added for the final defense of the dissertation.**

- This person should have expertise in some aspects of the research project
- The Program Director will approve of the selected member, and the student will invite the selected person to join the committee.
- Outside committee members may attend the dissertation seminar and defense in-person or remotely. Limited funds may be available to sponsor travel so the outside member can attend in person but are not guaranteed.

## **Insufficient Progress and Academic Probation**

This Handbook details the expectations for graduation, as well as the responsibilities of both students and faculty. The student's research advisor and thesis/dissertation committee will monitor the student's progress closely and help the student to stay on track. This includes biannual or annual meetings with the thesis/dissertation committee, where evaluation of student progress and planned timelines will reveal potential problems before they become an issue. Nevertheless, under individual circumstances, a student may find themselves to be off track. Below, the situations that constitute a "off track" status are defined, and steps for remediation are specified.

### **M.S. students are considered to be "off track" if any one of the following occurs:**

- Required core courses are completed with a grade below "B" or students has achieved lower than a B on either of the two comprehensive examinations for the Principles of Neuroscience courses.
- Average GPA falls below 3.0 for a semester.
- A written prospectus is not submitted by the beginning of the 3rd semester within the program (e.g., fall of Year 2 for students entering in Fall or Summer).
- Defense of the prospectus is not successfully achieved by the second attempt.
- A master's thesis is not submitted to the thesis committee within two years of the approved prospectus.
- The master's thesis defense is not successful upon the second attempt.

### **Ph.D. students are considered to be "off track" if any one of the following occurs:**

- Required core courses are completed with an average grade below "B" or students has achieved lower than a B on the comprehensive examinations for either of the two Principles of Neuroscience courses.
- Average GPA falls below 3.0 for a semester.
- A dissertation proposal is not submitted by end of the 5th semester within the program (e.g. Fall of Year 3 for students entering in Fall or Summer).
- Defense of the dissertation proposal is not successfully achieved by the second attempt.
- A dissertation is not submitted to the dissertation committee within 5 years of advancement to candidacy.
- At the time of the dissertation defense, the student does not have a body of work that tells a complete story with figures ready for publication.
- The dissertation defense is not successful upon the second attempt.

## **Procedures**

Any Advisory Committee member may bring an "off track" status to the attention of the Neuroscience Program Director. In turn, the Program Director will swiftly handle the case following the procedures outlined below:

### **Step 1: Ad-hoc Committee Meeting**

The case of a student considered "off track" will be heard by an ad-hoc session of the Neuroscience Council or Graduate Committee if existing. In addition, the following personnel will attend: the student's thesis committee and a student representative (M.S. student for M.S. case; Ph.D. student for Ph.D. case; non-voting member). The Program Director will appoint the student representative. The student "off track" will orally present their case at the ad- hoc meeting by reading a statement/letter. After the

student presentation, the ad-hoc committee members will discuss the case and formulate recommendations on how to get the student back on track, including an expected timeline. Majority vote will determine the course of action for the student. The student's committee will meet bi-annually until the student is back on track, within the time limits set at the ad-hoc meeting.

### **Step 2: Academic Probation**

If the ad-hoc committee recommended a clear plan for the student to rectify any identified problems (in step 1), but the student was unable to get back on track in the expected timeframe, the student will be placed on academic probation until such time as the problem is dissolved. The Program Director, in consultation with the graduate and thesis committee, will determine a reasonable time frame for the probationary period, or the student may be dismissed from the Graduate Program.

### **Step 3: Dismissal from Graduate Program**

After the probationary period determined in step 2, a student who fails to resolve the original problem(s) causing probation may be subject to dismissal. In this case, the Program Director will notify the Office of Graduate Studies Director, and the student will be dismissed from the Program. Under extenuating circumstances, the Program Director may petition the Office of Graduate Studies Director for an extension of the probationary time period.

## **Moving between the M.S. and Ph.D. programs**

### **From M.S. to Ph.D.**

#### Before M.S. Graduation

A student interested in switching programs from M.S. to Ph.D. should first discuss their plans with their advisor. After that, the student will convene a thesis committee meeting, at which the student lays out arguments and concrete plans for pursuing the new program. The committee discusses the student's individual case and formulates recommendations. If the committee favors the student entering the Ph.D. program, the student will assemble an application package (including an approved funding plan from the chosen Ph.D. advisor) and submit it to the Neuroscience Program. The Neuroscience Council or Graduate Committee will handle individual cases on a rolling basis. If the Neuroscience Graduate Committee and the Neuroscience Program Director approves the application, the student will then continue their trajectory as a Ph.D. student.

Generally, a student seeks to remain within the laboratory they started the M.S. research. In this case, the student's thesis/dissertation committee could generally stay the same. This option should not delay the student's time to graduation.

However, it is possible for a student to also change laboratories at the time of switching programs. Depending on individual circumstances, such a switch might necessitate starting a new project and might incur additional time needed for graduation. Furthermore, a new dissertation committee would need to be established.

If the student requesting the change had a GA funded by the Neuroscience Program, the change, if approved, does not guarantee continuation of funding into the Ph.D.

#### After M.S. Graduation

If a student intends to continue in the Ph.D. program after their graduation from the CMU

M.S. program, a standard application to enter the Ph.D. program is required. Completion of Neuroscience core courses during the M.S. will count toward the core coursework requirement for the Ph.D. Otherwise, the student will be considered to be in Year 1 of the Ph.D. program, will use the standard timeline for Ph.D. students, and will need to meet all of the dissertation proposal submission and defense requirements of the Ph.D. program.

#### **From Ph.D. to M.S.**

Each case will be unique, and thus guidelines are intentionally broad. The student may seek the switch in program, or the student's advisor and/or the student's dissertation committee may recommend the switch.

A student interested in switching programs from Ph.D. to M.S. should first discuss their plans with their advisor. After that, the student will convene a thesis/dissertation committee meeting, at which the student lays out arguments and concrete plans for pursuing the new program. Analogously, the advisor lays out arguments and concrete plans for pursuing the new program. The thesis/dissertation committee will remain the same for the student's new course of study.

If the dissertation committee favors the student moving into the M.S. program, the student will submit a formal request for the change to the Neuroscience Program Coordinator and complete all required paperwork. The Neuroscience Council or Graduate Committee will review individual cases on a rolling basis. If the Neuroscience Council or Graduate Committee and the Neuroscience Program Director approves the change of program, the student will then continue their trajectory as a M.S. student.

## Milestones in Completion of Degrees

To complete their degree in a timely fashion, students should adhere closely to the schedules below.

Forms and instructions can be found at the [Office of Graduate Studies](#).

### **M.S. Timeline**

<b>Year</b>	<b>Semester</b>	<b>Milestones</b>
1	Fall	<ul style="list-style-type: none"><li>• Begin coursework</li><li>• Form a thesis committee</li><li>• Email the Neuroscience Program Coordinator with an outline of planned series of courses, approved by advisor</li></ul>
1	Spring	<ul style="list-style-type: none"><li>• Write M.S. prospectus</li><li>• Have a thesis committee meeting regarding planned project</li><li>• Submit prospectus form</li><li>• Submit progress report</li></ul>
1	Summer	<ul style="list-style-type: none"><li>• Start research project (or continue research if started during year 1)</li></ul>
2	Fall	<ul style="list-style-type: none"><li>• Continue research</li><li>• Have a thesis committee meeting</li><li>• Discuss timeline for completion of research project – determine when student will be ready to write the thesis</li></ul>
2	Spring/Summer	<ul style="list-style-type: none"><li>• Complete research</li><li>• Write, publicly present, and defend dissertation</li><li>• Submit all paperwork</li></ul>



## Ph.D. Timeline

Year	Semester	Milestones
1	Fall	<ul style="list-style-type: none"> <li>• Begin coursework</li> <li>• Email the Neuroscience Program Coordinator with an outline of the planned series of courses approved by research advisor</li> </ul>
1	Spring	<ul style="list-style-type: none"> <li>• Form a thesis/dissertation committee</li> <li>• Have a dissertation committee meeting regarding planned project</li> <li>• Submit progress report</li> </ul>
1	Summer	<ul style="list-style-type: none"> <li>• Start research project (or continue research if started during year 1)</li> </ul>
2	Fall	<ul style="list-style-type: none"> <li>• Continue research</li> <li>• Meet with dissertation committee</li> </ul>
2	Spring	<ul style="list-style-type: none"> <li>• Continue research</li> <li>• Write dissertation proposal</li> <li>• Defend dissertation proposal at a committee meeting</li> <li>• Submit prospectus form</li> <li>• Submit progress report</li> </ul>
2	Summer	<ul style="list-style-type: none"> <li>• Continue research</li> </ul>
3-4*	Fall	<ul style="list-style-type: none"> <li>• Continue research</li> <li>• Meet with dissertation committee</li> </ul>
3-4*	Spring	<ul style="list-style-type: none"> <li>• Continue research</li> <li>• Meet with dissertation committee</li> <li>• Discuss timeline for completion of research project</li> <li>• Submit progress report</li> </ul>
3-4*	Summer	<ul style="list-style-type: none"> <li>• Continue research</li> </ul>
4*-5	Fall	<ul style="list-style-type: none"> <li>• Continue research</li> <li>• When research is nearly complete, plan writing process with research advisor and committee</li> </ul>
4*-5	Spring	<ul style="list-style-type: none"> <li>• Complete research</li> <li>• Write, publicly present, and defend dissertation</li> <li>• Submit all paperwork</li> </ul>

\*In year 4, at each committee meeting, the committee should decide whether research is complete enough to begin writing the dissertation. If so, follow plan for year 4-5; if not, follow plan for year 3-4.

## **Neuroscience Program Course Descriptions**

### **NSC 501 and NSC 502 - Principles of Neuroscience**

Foundational series presenting core topics in Neuroscience. Serves as the core coursework to establish competency in Neuroscience general knowledge. You must receive a B or better for the class and its comprehensive final exams.

### **NSC 600 - Special Issues in Neuroscience**

Subjects of contemporary neuroscience not covered by regular curriculum. May be repeated to a maximum of twelve hours. Prerequisites: Permission of instructor.

### **NSC 690 - Research Seminar Neuroscience**

Seminar emphasizing review of the primary literature in several areas of neuroscience. Is repeated two times for two credits. Prerequisites: Graduate standing in the Neuroscience Program.

### **NSC 696 - Directed Research**

For students who desire to investigate some research problem in neuroscience. Prerequisites: Graduate standing. Completed NSC 696 Directed Research Contract required for registration.

### **NSC 697 - Independent Study**

For students who accept the responsibility of studying a specific area of neuroscience through literature review, with minimal supervision. Prerequisites: Graduate standing. Completed NSC 697 Independent Study Contract required for registration.

### **NSC 789 - Graduate Seminar in Neuroscience**

In-depth exploration of a specific area in neuroscience through the review of the primary literature. May be repeated up to a maximum of 12 hours. Prerequisites: Permission of instructor or mentor.

### **NSC 790 - Graduate Research Seminar**

This course is designed to complement research projects of graduate students by having students present their research to peers and faculty, with the intent of developing presentation skills. Exposure to fellow students' presentations should also serve to broaden students' knowledge in the field. Prerequisites: Graduate standing in the Neuroscience Program.

### **NSC 798 - Master's Thesis: Design**

Design of a Master's thesis. In this course, students will prepare their M.S. project prospectus and present their proposal to their thesis committee. CR/NC only. Prerequisites: Graduate standing in the Neuroscience Program.

### **NSC 799 - Master's Thesis: Implementation**

Completion of a Master's thesis designed in NSC 798. Students will write and defend their thesis for their thesis committee. CR/NC only.

### **NSC 898 - Doctoral Dissertation: Design**

Design of a doctoral dissertation. In this course, students will prepare their dissertation proposal and defend their proposal for their thesis committee. CR/NC only.

### **NSC 899 - Doctoral Dissertation: Implementation**

Completion of the doctoral dissertation designed in NSC 898: data collection, analysis, and write-up. CR/NC only.

**NSC Graduate Student Rubric** – Found in NSC Graduate Students Teams in the Folder: NSC Graduate Program Forms

During their time in the NSC program, graduate students are expected to develop a number of skills and competencies, as well as to complete significant research. To help students and advisors visualize the progress that students are making toward their goals, students, advisors, and other committee members will complete rubrics. These rubrics will be used in all of the situations described below.

**Thesis/Dissertation Committee Meetings** – At each committee meeting, each Committee member will complete a committee meeting rubric. Any major discrepancies between committee members will be discussed at that time. Completed rubrics should be given to the graduate program administrator. Students will also complete a rubric to self-evaluate. After the committee meeting, the advisor will review the rubrics and discuss them with the student. It is expected that students will progress through the levels as they gain experience.

**Ph.D. Qualifying Exam** – Students who enter the Ph.D. program must pass a qualifying exam before advancing to Ph.D. candidacy. This exam involves a written and oral defense of the proposed Ph.D. project. Students must achieve the levels indicated in the table below in order to pass the qualifying exam.

**Approval to Defend** – The Thesis/Dissertation Committee will approve the student for defense of their thesis or dissertation at a committee meeting that occurs 3-6 months before the planned defense. Students must achieve the levels indicated in the table below in order to be granted approval to defend.

<b>Levels Required on Graduate Student Rubric</b>		
	<b><i>Pass Ph.D. Qualifying Exam or Approval to Defend M.S.</i></b>	<b><i>Approval to Defend Ph.D.</i></b>
Research Project	Level 3 or above	Level 4 or above
Ethics and RCR	Level 3 or above	Level 5
Other categories	At least 2 at level 3 or above All others at level 2	At least 2 at level 5 All others at level 4

NSC Graduate Student Self Evaluation – Found in NSC Graduate Students Teams in the Folder: NSC Graduate Program Forms

NSC 696 Directed Research Contract – Found in NSC Graduate Students Teams in the Folder: NSC Graduate Program Forms

NSC 697 Independent Study Contract – Found in NSC Graduate Students Teams in the Folder: NSC Graduate Program Forms