

Program Policy Statement

Interdisciplinary Neuroscience Graduate Program (INGP) within the Graduate College Offering the Doctor of Philosophy (Ph.D.) degree

This program policy document should serve as the primary resource for students enrolled in the Neuroscience Graduate Program (the “program”) at the University of Delaware (the “university”). Contained within is important information on the philosophy of the program, as well as program-specific policies and procedures related to academic and student affairs. Policies and procedures not addressed in this manual will default to those existent within the University Graduate Catalog or other University publications. Students are urged to obtain and read all relevant University publications and to keep abreast of changes in practice and / or governance.

For a graduate student, the university degree requirements are those identified in the Graduate Catalog and the program requirements as stated in this Program Policy Statement effective at the time of admission. If the requirements change during the time the graduate student is enrolled, the graduate student can choose, but is not required, to abide by the “new” requirements.

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Part I. Program History

A. Purpose

Contemporary neuroscience is an interdisciplinary field that studies the nervous system to understand the biological bases of behavior, cognition, subjective experience, psychiatric or neurological disease, and the brain's computational processes, networks and functions. A field of study since the ancient Greeks, the latter part of the 20th century in particular experienced an explosion of neuroscience research when a common foundation began to emerge, built on the language of biochemistry that governs the rest of biology. The body of knowledge represented by neuroscience is vast. The idea of a neuroscience as a dedicated and multidisciplinary branch of biology, that synergistically combines physiology, anatomy, chemistry, physics, mathematical modeling, engineering, psychology, and rehabilitation, has resulted in a flourishing field.

At the University of Delaware, one could argue that Neuroscience needs a cohesive structure, with its interdisciplinary nature loosely spread across laboratories/departments/colleges. Current issues in neuroscience are beyond the expertise of a single laboratory and require a collaborative approach. The **Interdisciplinary Neuroscience Graduate Program (INGP)** is designed to develop a unified atmosphere to expose students to the exciting developments in brain function, providing interdisciplinary training to current/future graduate students and prepare them for a research-oriented career in academics or industry. Centralized governance of the program will foster the distribution of information on course offerings and research opportunities to all graduate students. The INGP will also enhance collaboration between existing faculty via co-mentoring of graduate students and enrich the graduate student training experience via their exposure to techniques and approaches beyond their specific research group. As well, it will boost opportunities for funding (i.e., NIH T32) and philanthropic/donor support

B. Date of Permanent Status

The interdisciplinary Neuroscience Graduate Program is proposed for provisional status as a new program of graduate study that is housed within the Graduate College.

C. Degrees Offered

The degrees awarded to those who complete this program are either a Master of Science (MS) or a Doctor of Philosophy (PhD) in Neuroscience. The degree will be conferred by the Graduate College.

D. Statement on Diversity and Inclusion

The Graduate College supports the Council of Graduate Schools Resolution "[Building An Inclusive Graduate Community: A Statement of Principles](#)". Toward that end, the Graduate College supports the development and success of historically underrepresented graduate students at the University of Delaware. Within these pages (see <https://grad.udel.edu/students/diversity-inclusion/>) you will learn how UD enhances the graduate school experience for all by facilitating diversity of thought, background and perspective amongst its graduate community. We welcome all to actively engage in the support of an inclusive graduate community.

Part II. Admission

A. Admission Requirements

To be admitted, a student must have identified a faculty mentor and obtained their commitment for advisement. Prior to submitting an application, it is sensible to visit the faculty webpages of potential advisors or communicate with them directly to determine whether they are recruiting students.

Applicants must submit all materials directly to the Graduate College using the [online admission process](#) before their admission can be considered.

- 1) A completed University of Delaware Graduate College application.
- 2) A Bachelor of Science (BS) or Master of Science (MS) degree from an accredited college or university. A minimum undergraduate GPA of 3.0 on a 4.0 system is required. A Master of Science degree is not required for acceptance into the doctoral program.
- 3) Optional submission of quantitative and verbal GRE score.
- 4) All foreign national applicants for graduate study at the University of Delaware are expected to meet UD requirements for foreign students described at <http://grad.udel.edu>. These include English proficiency official TOEFL scores, etc. (see <https://grad.udel.edu/apply/toefl-ielts/>).
- 5) Applicants must submit an essay response to specific questions asked on the application; a resume; and a statement of professional goals and objectives. (see <https://grad.udel.edu/apply/application-essay/>).
- 6) Applicants must submit at least three letters of recommendation. All letters of recommendation should be managed electronically through the Graduate College.
- 7) One official transcript of all US colleges and universities attended must be sent directly from the institution to the Graduate College or be provided in a sealed envelope with the application packet. Students who have attended the University of Delaware need not supply a transcript from Delaware.
- 8) One official transcript of all non-US based college and university records is required. The transcript must list all classes taken and grades earned. If the transcript does not state that the degree has been awarded, send a degree certificate that states that the degree has been awarded. If the degree has not been awarded or the degree certificate has not been issued, evidence of the awarded degree must be provided prior to the first day of classes in the term of admission. For institutions that issue documents only in English, send the English original. For institutions that issue documents both in English and a foreign language, send both the English language original and the foreign language original. For institutions that issue documents only in a foreign language, send the foreign language original and a certified translation in English. The translation must be certified by an official of the issuing institution, a state- or court-appointed translator, or the Embassy of the issuing country in the United States. If it is necessary to send non-original documents:
 - a) The documents must be original “attested copies”, officially attested to by the issuing institution or the Embassy of the issuing country in the United States, and
 - b) Certified translations must be originals. No copies will be accepted.

B. Prior Degree Requirements

A Bachelor of Science (BS) or Master of Science (MS) degree from an accredited college or university. A minimum undergraduate GPA of 3.0 on a 4.0 system is required. A Master of Science degree is not required for acceptance into the doctoral program.

C. Application Deadlines

The Neuroscience Graduate Program accepts applications throughout the year on a rolling basis. Students can enroll in the Fall or Spring semester, or Summer session.

D. Special Competencies Needed

Admission decisions are made by the Executive Committee of the Neuroscience Graduate Program. Deficiencies in more than two areas of the below requirements will automatically result in denial of admission by the Executive Committee. Students will be admitted to the program based upon enrollment availability and their ability to meet the following minimum recommended entrance requirements.

- Acceptance by a primary advisor
- Financial support from the advisor's funding, advisor's department or from the Neuroscience Graduate Program (see Part VI below).
- Satisfactory completion of prerequisites (Grade of C- or better)
- Math through calculus (2 semesters)
- Anatomy/Physiology (1 semester)
- Physics (2 Semesters)
- Chemistry (2 Semesters)

E. Admission Categories

Students admitted into the Neuroscience Graduate program may be admitted into one of two categories.

Regular. Regular status is offered to students who meet all of the established entrance requirements, who have a record of high scholarship in their fields of specialization, and who have the ability, interest, and maturity necessary for successful study at the graduate level in a degree program.

Conditional. Conditional status is offered to applicants who are seeking admission to a degree program but lack specific prerequisites needed in the University of Delaware degree requirements. All conditional requirements must be met within the deadline given before regular status can be granted. Failure to meet the conditions by this deadline is grounds for dismissal from the program. Students admitted with conditional status to a degree program are generally not eligible for assistantships nor fellowships.

F. University Statement

Admission to the graduate program is competitive. Those who meet stated requirements are not guaranteed admission, nor are those who fail to meet all of those requirements necessarily precluded from admission if they offer other appropriate strengths.

Part III. Degree Requirements for the Doctor of Philosophy (PhD)

The requirements for the doctoral degree are the same, whether a student is entering the program with a bachelor's degree or a master's degree.

A. Degree Requirements

The Neuroscience PhD program is designed to be completed in a minimum of 4 years. The student and advisor work together to develop a program of study that must be submitted to the program director at the end of the first semester. To become a candidate for the doctoral degree, students must a) demonstrate adequate progress towards the degree, b) pass their qualifying examination at the end of year two, and c) successfully defend a proposal of their dissertation research. Details about each of these requirements are below.

1. Course Requirements / Program of Study

The Doctor of Philosophy in Neuroscience requires a minimum of 42 credits including 9 credits of dissertation. All students must submit a planned program of study by the end of their first semester, created with their primary advisors.

Required Courses (33 credits)

<u>NSCI 629 Integrative Neuroscience I</u>	3 credits
<u>NSCI 630 Integrative Neuroscience II</u>	3 credits
Statistics/Methods Course	3 credits
NSCI 626 Advanced Neuroanatomy	3 credits
Research Credits	15 credits
Electives (see Appendix below)	6 credits

Suggested Course Sequence and Milestones in Program of Study

Fall - Year I

NCSI 629 (3)
NCSI 626 (3)
Research (3)

Submission of Program of Study

Spring – Year I

NCSI 630 (3)
Elective (3)
Research (3)

Fall – Year 2

Statistics (3)
Research (3)

Spring – Year 2

Research (3)
Elective (3)

Qualifying Exam at end of year 2

Fall – Year 3

Research (3)

Spring – Year 3

Dissertation (3)

Defense of dissertation proposal in year 3

Fall – Year 4

Dissertation (3)

Spring – Year 4

Dissertation (3)

Defense of dissertation in year 4

2. Electives, Research Credits and Transfer Credits

Students in the Neuroscience PhD program are allowed to take a maximum of 21 credits of combined electives and research, where no more than 15 credits may be research. Additional electives or research credits can be taken, but will not count towards the required 42 credits for graduation.

A maximum of 9 credits earned at another U.S. institution may be applied to the Doctoral degree if not used to complete a previous degree. Grades must be a “B” or better to be acceptable for transfer and no older than five years.

3. Petitions for variance in degree requirements

Students may petition in writing for a variance in the degree requirements and must have approval from their faculty advisor and the Executive Committee.

Students may need to alter approved programs of study once they have entered the program due to reasons that can include scheduling conflicts or the creation of new courses directly related to the student’s goals. Students who wish to make changes to their program of study must obtain permission from their advisor and approval from the Executive Committee.

4. Residency Requirements

At least 4 academic years of graduate work are normally required for the Ph.D. degree. At least two continuous academic years must be devoted exclusively to full-time study in the major field in residence at the University of Delaware. Students holding assistantships are considered full-time with 6 credits. This residency requirement may be fulfilled using a fall and spring semester combination or a spring and fall semester combination, but summer or winter sessions do not meet the qualification. Course credit earned in a master's program at the University of Delaware may be applied toward the doctoral degree residency requirement if the candidate is receiving both degrees from the University in the same major field.

5. Registration Requirements Prior to Doctoral Candidacy

Course registration requirements are determined by the student's approved program of study. Once the student has registered for all course requirements in a program of study but has not yet met all of the stipulations for passing into candidacy, the student must maintain registration during the fall and spring semesters in course(s) or in three to twelve credits of Pre-Candidacy Study (964). Pre-Candidacy Study (964) is graded pass/fail. If the student registered in Pre-Candidacy Study is admitted to candidacy before the end of the free drop/add period of the next semester, the registration in Pre-Candidacy Study (964) for the preceding semester may be changed to the course, Doctoral Dissertation (969) by the Graduate College.

Full time, regular status students who are holding a graduate assistantship or tuition scholarship must be registered for a minimum of 6 graduate credits, and those holding a fellowship must be registered for a minimum of 9 graduate credits.

6. Qualifying Examination

The purpose of the Qualifying Exam is to evaluate the preparation of the student in the areas of background knowledge, methods and techniques, critical thinking, and oral and written scientific communication, and to develop a study and mentoring plan to address any shortcomings in this preparation. These criteria will be evaluated through both a written exam and an oral exam. Students will become PhD candidates upon passing the qualifying exam and the successful proposal of their dissertation research.

The exam will occur after the end of the second full year in the program. The exam will be evaluated by a committee of 3 faculty members and graded as Pass, Conditional Pass, or Fail. The Qualifying Exam must be completed by the end of the fifth full (not including winter or summer terms) academic semester, including remediation.

B. Policies and Committee Membership for Qualifying Exam

1. Eligibility for Qualifying Exam

Following the semester in which the student completes at least 24 graduate credits of their required coursework and at least 4 full semesters of study, typically during the summer following the second year of study, they will be eligible to proceed with their Qualifying Exam. For students with non-fall matriculation or part-time study, the timing of the Exam will be determined by course completion (i.e., four semester equivalent) and the approval of the Program Director. To take the Examination, each student must be in [good academic standing](#) and have approval of the faculty advisor.

2. Qualifying Examination Committee Membership

The Qualifying Exam committee will be made up of 3 members consisting of INGP faculty. Members will be recommended by the student's advisor and approved by the Program Executive Committee. Members must include:

- a) The student's advisor
- b) One Neuroscience faculty member who has some content expertise relevant to at least one aspect of the student's proposed research area
- c) One Neuroscience faculty member who would be considered outside the student's chosen research area.

Members of the Qualifying Exam committee may also become members of the student's dissertation committee, but this is not required. Any replacements of qualifying exam committee members must be approved by the Executive Committee.

3. Scheduling of the Qualifying Exam

No later than May 1st, the student will submit to his/her advisor and the Program Director a statement that identifies the student's area of specialization and a list of completed coursework. This will help guide the Executive Committee's selection of Qualifying Exam committee members.

- Written exams are typically scheduled for the first week of June.
- Oral exams are typically scheduled for the third week of June.

Students will be expected to maintain participation in their regular research activities while they prepare for the written and oral examinations. For students with non-fall matriculation or part-time study, the timing of each component of the Exam will be determined by the Program Director, in consultation with the Qualifying Exam committee. If a student fails their 1st qualifying exam, they will

be offered a 2nd attempt at both a written and oral exam, to be completed by the end of the summer, before starting the next academic year. If they fail a 2nd time, continuation in the program will follow the procedures specified under “Qualifying Exam Results” below.

The written exams will take place over two days. On each day, the exam will consist of 5 questions, of which the student must write answers to 3, within a period of 3 hours. Each question will be submitted by a different faculty member from within the Neuroscience Graduate Program. In the case of a retake, a new exam will be created.

The Qualifying Exam committee will evaluate the written exam to determine (1) whether the student demonstrates an acceptable knowledge of the scientific background and techniques relevant to their program of study and (2) whether the student demonstrates written scientific communication skills expected of a student completing the second year of training in the Neuroscience Ph.D. program.

The committee will have a standardized rubric to evaluate the written exam and will provide the student with formal written feedback on the written exam two weeks prior to the oral exam date.

4. Oral exam

Within 3 weeks of completing the written exam, each student will face an oral examination based on their answers to the written exam. Feedback on the written exam will be provided to the student within one week of the submission of the exam. This allows two weeks for the student to consider any identified deficiencies prior to the oral exam.

The oral exam is limited to two hours. The student will prepare a 15-minute oral presentation based on the key components of their written exam and may address written feedback provided by their committee. Following the presentation, there will be one hour and 45 minutes for questions, which will be divided between items relating to the written exam content, obtaining responses to the feedback from written exam, and questions representing the breadth of neuroscience covered in the student’s completed required and elective courses.

5. Qualifying Exam Results

The Qualifying Examination Committee will submit a recommendation to the Neuroscience Executive Committee that the student either ‘Pass’, ‘Conditionally Pass’ or ‘Fail’ the Qualifying Exam. The recommendation will reflect the committee consensus opinion:

Pass: A decision of ‘Pass’ means that the committee feels that the student’s preparation is adequate to continue his/her work toward the candidacy stage.

Conditional Pass: A decision of ‘Conditional Pass’ indicates that the committee believes the student is not currently, but will be able to, successfully complete dissertation-level research, after successfully completing additional education or training within **no longer than 1 additional semester**. When completed, the student will be able to be successful in independent dissertation-level research. If the committee recommends a student’s Conditional Pass, they should also prepare a proposed study and mentoring plan to address any identified areas of weakness or insufficient preparation.

Fail: A decision of ‘Fail’ means that the committee feels that the student’s present areas of weakness and/or insufficient preparation are significant enough to prevent the student from successfully achieving programmatic milestones necessary to demonstrate and complete independent dissertation-level research, and that these deficiencies cannot be corrected within the timeframe set by the Graduate Program (by the end of the fifth full semester) for accomplishing these milestones.

The recommendation of the Qualifying Examination Committee will be reviewed by the Executive Committee, who will make the final decision. The Program Director will communicate the decision to the student and provide and retain a written copy of the study and mentoring plan, if applicable. Progress made on the study and mentoring plan shall be documented on subsequent periodic reports, in line with specifications made in the plan and consistent with the requirement to complete the plan within one semester.

Inadequate progress in the study and mentoring plan recommended by the committee may be grounds for dis-enrollment from the PhD program.

6. Grievance Procedures

Students concerned that they have received an unfair evaluation or have been graded inappropriately may file grievances in accordance with the student guide to University of Delaware policies. Students are encouraged to contact the Neuroscience Program Director prior to filing a formal grievance in an effort to resolve the situation informally.

C. Policies and Committee Membership for the Dissertation

1. Establishment of Dissertation Committee

The student and his/her advisor will create a dissertation committee at the time the student begins to develop the dissertation proposal. In addition to the advisor, the dissertation committee shall include at least three faculty, all from within the Neuroscience PhD Program and with one member from outside of the advisor's department. The dissertation advisor must be a member of the Neuroscience faculty.

With the approval of the Neuroscience Executive Committee, one professional staff member who holds a secondary faculty appointment within an academic department may serve as a committee member. However, all three committee members must hold the doctoral degree. Faculty who have retired or resigned from the University may maintain committee membership or continue to chair committees of students whose work began under their direction prior to their retirement or departure from the University.

Continuing Track Neuroscience faculty may co-advise Neuroscience students and co-chair the dissertation committee if the other co-advisor/co-chair is a tenure track Neuroscience faculty member. Outside committee members must hold a doctoral degree and shall include individuals not affiliated with the Neuroscience PhD Program. These may be individuals from outside of the University who are recognized for their expertise in the area of study specified by the dissertation. The Neuroscience Program Director must approve committee members from outside of the University. It is the responsibility of the dissertation advisor to replace members who withdraw from the committee during the dissertation process.

2. Defense of the Dissertation Proposal

The dissertation proposal includes a written proposal of research and an oral defense of this proposal. Considering the interdisciplinary nature of this program, the format of the proposal may vary across research areas and faculty. Conventional proposal formats of appropriate scale are suggested, such as those required by federal funding agencies such as the National Institutes of Health or the National Science Foundation. The proposals must convey the student's knowledge of the area of study, critical review of the literature, sound application of the scientific method, and effective communication.

Institutional Approval of Research Protocols is Required. Prior to the dissertation proposal defense, proposals that involve the use of human or animal subjects must receive approval from the university Human Subjects Review Board (HSRB) and/or the Institutional Animal Care and Use Committee (IACUC).

The defense of the dissertation proposal will be held only if a majority of members of the dissertation committee have determined that a defense is appropriate. A final copy of the written dissertation proposal must be delivered to the members of the dissertation committee at least two weeks in advance of the proposal defense. A copy of the dissertation proposal must be available to the university community one week prior to the proposal defense by submitting an electronic copy to the Neuroscience Graduate Program administrative staff for redistribution.

The Dissertation proposal defense will be open to the public, and invitations will be sent to all Neuroscience faculty and students at least one week prior to the defense date. The candidate will present a summary of the proposed research, and will then field questions from the committee, attending faculty, and invited guests. After all questions have been fielded, the dissertation committee will have a closed session with the student, which will focus on the research proposal. Finally, the committee will meet alone and vote on the outcome. The student may not receive more than one dissenting vote from members of the committee to receive a passing grade. The possible outcomes of the proposal defense are pass, conditional pass, or failure. The outcome will be presented to the student, along with any conditions or requirements for proposal revisions. Students who fail the dissertation proposal defense will receive one additional opportunity to repeat the process and defend a new or modified dissertation proposal.

For a failure or conditional pass, requirements must be addressed within six months of the original exam date.

3. Admission to Doctoral Candidacy

Admission to doctoral candidacy will follow the policies of the graduate college.

For Neuroscience PhD students, successfully defending the dissertation proposal serves as the final acceptance of the research project. When a student has met the requirements for admission to candidacy, the student should apply for candidacy. Please see the Recommendation for Candidacy for Doctoral Degree form (PDF) for details, including submission deadlines for each possible graduate date.

http://www1.udel.edu/gradoffice/forms-new/Doctoral_Degree_Recommendation.pdf

4. Defense of the Dissertation

The format of the written dissertation must adhere to the University's Thesis and Dissertation Manual and style guidelines. These resources are available electronically on the Graduate College's website (see the Step-By-Step Guide for Graduation: <https://grad.udel.edu/policies/step-by-step-guide-to-graduation/>).

All doctoral degree candidates must pass a final oral examination upon completion of the dissertation. The examination will consist of a defense of the dissertation and a test of the candidate's mastery of the fields covered in their individual research area. The defense of the dissertation will be held only if a majority of members of the dissertation committee have determined that a defense is appropriate.

A Dissertation Defense Notification form must be submitted two weeks in advance of the defense. <https://sites.udel.edu/gradoffice/dissertation-defense/>

A copy of the dissertation must be made available to the university community one week prior to the dissertation defense by submitting an electronic copy to the Neuroscience program administrative staff for redistribution.

A Certification of Doctoral Dissertation Defense form must be completed at the time of the defense. Send the original copy to the Graduate College Form revised: July 2019).

http://www1.udel.edu/gradoffice/forms-new/certification_doctoral_dissertation.pdf

The dissertation defense will be open to the public, and invitations will be sent to all Neuroscience Graduate Program faculty and students at least one week prior to the defense date. The candidate will present a summary of the completed research, and will then field questions from the committee, attending faculty, and invited guests. After all questions have been fielded, the dissertation committee will meet alone to vote on the outcome. The possible outcomes of the dissertation defense are pass, conditional pass, or failure. The outcome will be presented to the student, along with any conditions or requirements for dissertation revisions. For conditional pass, requirements must be addressed within six months of the original exam date. Students who fail the dissertation defense will receive one additional opportunity to repeat the process and defend a new or modified dissertation. For a failure or conditional pass, requirements must be addressed within six months of the original exam date.

5. Processing the Final Document

Students must follow the university approved step-by-step guidelines for graduation. The University reserves the right to duplicate a dissertation for distribution to other libraries or for the use of individual scholars. However, the University will not publish a dissertation for general distribution without the written consent of the author. If copyrighting of a dissertation is desired, it may be arranged when the dissertation is submitted to the Graduate College. Published works are eligible for copyright protection in the United States if the work is first published in the United States.

D. Timetable and Definition of Satisfactory Progress Towards the Degree

Students entering a doctoral program with a bachelor's degree are given 14 consecutive semesters to complete the degree requirements. Those entering with a master's degree are given 10 consecutive semesters. Extensions may be requested for extenuating circumstances.

A GPA of 3.0 is required to avoid probationary steps that may eventually lead to dismissal.

Up to date information about milestones in degree progress, grounds for dismissal and student appeals is available on the Graduate College page (<https://grad.udel.edu/policies/graduate-academic-policies/>).

Part IV. Degree Requirements for the Master of Science (MS)

A. Degree Requirements

Like many doctoral programs at UD, we will not solicit or recruit students to the Neuroscience Master of Science program as a “stand alone” degree. However, students who enroll in our doctoral program will have the option of earning the M.S. degree as an interim step toward their doctorate. The M.S. may also be a terminal degree for students who leave the doctoral program either voluntarily or for failing to meet program milestones (see Part IV, Section D.4 below). The student and advisor work together to develop a plan for meeting degree requirements based on their progress in the doctoral program at the time the M.S. degree is sought. This involves course work but may or may not require completion of an M.S. thesis. Details about M.S. degree requirements are below.

1. Course Requirements / Program of Study

The Master of Science in Neuroscience follows the 1st two years of the PhD program and requires a minimum of 30 credits including 12 credits of research or thesis. All students must complete a planned program of study, created with their primary advisor.

Required Courses (30 credits)

<u>NSCI 629 Integrative Neuroscience I</u>	3 credits
<u>NSCI 630 Integrative Neuroscience II</u>	3 credits
Statistics/Methods Course	3 credits
NSCI 626 Advanced Neuroanatomy	3 credits
Research or Thesis	12 credits
Electives (see Appendix below)	3-6 credits

Suggested Course Sequence and Milestones in Program of Study

Fall - Year I

NCSI 629 (3)
NCSI 626 (3)
Research (3)

Spring – Year I

NCSI 630 (3)
Elective (3)
Research (3)

Submission of Program of Study

Fall – Year 2

Statistics (3)
Research (3)

Spring – Year 2

Research (3)
Elective (3)
or Master’s Thesis (6)

When a non-thesis option has been developed with the advisor and approved by the Executive Committee, the student will replace the 6 credits of thesis with:

- a) 3 credits of research credit and 3 credits of additional coursework OR
- b) 6 credits of research credit

2. Electives, Research Credits and Transfer Credits

Students in the Neuroscience PhD program are allowed to take a maximum of 18 credits of combined electives and research, where no more than 12 credits may be research. Additional

electives or research credits can be taken, but will not count towards the required 30 credits for graduation.

A maximum of 6 credits earned at another U.S. institution may be applied to the master's degree if not used to complete a previous degree. Grades must be a "B" or better to be acceptable for transfer and no older than five years.

3. Petitions for variance in degree requirements

See Section III.A.3.

4. Residency Requirements

At least 2 academic years of graduate work are normally required for the M.S. degree. At least one continuous academic year must be devoted exclusively to full-time study in the major field in residence at the University of Delaware. Students holding assistantships are considered full-time with 6 credits. This residency requirement may be fulfilled using a fall and spring semester combination or a spring and fall semester combination, but summer or winter sessions do not meet the qualification. Course credit earned in a master's program at the University of Delaware may be applied toward the doctoral degree residency requirement if the candidate is receiving both degrees from the University in the same major field.

B. Policies and Committee Membership for the Thesis

Policies and procedures for completing an M.S. thesis will follow closely those established for the PhD program, with the exception of the thesis committee having only three members (four with PhD).

1. Establishment of Thesis Committee

The student and his/her advisor will create a thesis committee at the time the student begins to develop the thesis proposal. In addition to the advisor, the dissertation committee shall include at least two faculty, all from within the Neuroscience PhD Program or with one member from outside of the advisor's department. The thesis advisor must be a member of the Neuroscience faculty. Other potential members will follow the policies described in Section III.C.1.

2. Defense of the Thesis Proposal

See Section III.C.2.

3. Defense of the Thesis

See Section III.C.4.

4. Processing the Final Document

See Section III.C.5.

C. Timetable and Definition of Satisfactory Progress Towards the M.S. Degree

Up to date information is available on the Graduate College page:
<https://grad.udel.edu/policies/graduate-academic-policies/>

Part V. Assessment Plan

A. Preliminary Assessment (during provisional 5-year approval)

Director(s) of a program must provide to the Graduate College Dean an annual statement of number of students matriculating into the program, the number of faculty advisers within the program, the progress of students in the program (in terms of degree completion milestones), and the numbers of presentations and publications made by students and faculty specific to this program.

B. Objectives and Assessment Plan

The Neuroscience Graduate program will follow the Academic Program Review (APR) schedule, policies and procedures, established by the Provosts office and faculty senate. Data will be provided by the Office of Institutional Research and Effectiveness, in conjunction with faculty/student interviews, measures of scholarly productivity, alumni surveys and national rankings when available. Annual meetings will be held to discuss curricular changes, course learning objectives, review analyzed data, identify action items, and establish timelines and assignments for responsibilities. The Neuroscience Graduate program will seek consultation from the Center for Teaching and Assessment of Learning to periodically reexamine appropriate learning outcomes, assessment criteria, and benchmarks for success.

The objective of the Neuroscience Graduate Program is to prepare students for research-based careers. This requires:

- A strong foundation in neuroscience
- A strong foundation in research skills
- Effective oral and written communication skills
- Critical thinking skills
- Organizational skills

These learning objectives are critical for success of the student. They are measured directly by grades in the two fundamental neuroscience courses taken during year one and by performance in courses related to the student's research area. Doctoral students are rigorously tested on content related to fundamental neuroscience and their research area during qualifying exams. Both MS and PhD students demonstrate their research skills, communication skills, critical thinking and organization during the proposal and defense of their thesis or dissertation.

Part VI. Financial Aid

A. Financial Assistance

Financial assistance for students in the Neuroscience program is obtained from a variety of sources and will therefore vary in form and availability. Assistance will be awarded on a competitive basis to

applicants' best fitting the needs of the granting agencies and sponsoring faculty. Students receiving full stipends will be expected to work up to an average of 20 hours per week on contract responsibilities and students are expected to maintain full-time student status.

B. University of Delaware Dissertation and Graduate Fellows Awards

Applications for the University of Delaware Dissertations and Graduate Fellows Awards must follow the Graduate College guidelines, and be submitted for approval to the Neuroscience Executive Committee at least 2 weeks prior to the announced deadlines. These are competitive and merit based awards with limited submissions permitted from each program.

Part VII. Departmental Operations

Students in the Interdisciplinary Neuroscience PhD Program are departmentally situated with the home department of their faculty mentor. Students are expected to adhere to all operational policies of that department.

PART VII. Graduate College Academic Policies

The INGP will follow all academic policies as described in the Graduate College website.

<https://grad.udel.edu/policies/graduate-academic-policies>

Appendix – Lists of Elective Courses

A. Elective Courses Categorized by Neuroscience Focus Areas

Elective courses are offered to allow students to develop specialized knowledge of their research area. This will be done in consultation with their graduate advisor. A total of 12 elective credits are required.

<i>Behavioral/Cellular/Molecular Neuroscience</i>	
BISC/NSCI/PSYC 627	Advanced Neurophysiology
NSCI 634	Stress and the Brain
NSCI 635	Neuroplasticity
NSCI 638/PSYC 628	Advanced Neuropharmacology
NSCI 640	The Immune System and Behavior
NSCI 641	Hormones and Behavior
BISC 639	Developmental Neurobiology
BISC654	Biochemical Genetics
BISC602	Molecular Biology of Animal Cells
BISC605	Advanced Mammalian Physiology I

BISC606	Advanced Mammalian Physiology II
BISC612	Advanced Cell Biology
<i>Clinical/Developmental Neuroscience</i>	
NSCI 638	Clinical Neuropsychology
KAAP 607	Motor Learning and Control
KAAP 609	Concussion
NSCI 632	Developmental Behavioral Neuroscience
BMSC/PHYT 640	Seminar in Motor Systems Neuroscience
KAAP 651	Neurophysiological Basis of Human Movement
NSCI 462	Neural Basis of Communication
KAAP 667	Visual 3D
EDUC 870	Child Neuropsychology
EDUC 802	Reading Development and Instruction
<i>Cognitive Neuroscience</i>	
NSCI 433	Cognitive Neuroscience
CGSC 610	Embodied Cognition
CGSC 618	Meaning and Language Use
CGSC 620	Research Methods in Cognitive Science
CGSC890	Topics in Cognitive Science
CGSC/LING 671	Discovering Human Language
NSCI 636	Seminar in Spatial Cognition
NSCI 639	The Emotional Brain
NSCI 642	Social Neuroscience
PSYC 642	Mental Representation and Memory
NSCI 643	Body and Space
PSYC 675	Language Acquisition
<i>Computational Neuroscience</i>	
CPEG/PSYC 630	Neurons and Networks
CISC 642	Introduction to Computer Vision
CGSC/LING 655	Computational Linguistics
CGSC/CISC 681	Artificial Intelligence
CISC 682	Introduction to Human-Computer Interaction
CISC 882	Natural Language Processing
CISC 889	Advanced Topics in Artificial Intelligence
BINF/CISC 689	Topics: Artificial Intelligence

B. Supplemental Elective Courses

<i>Instrumentation and Programming</i>	
KAAP 617	Biomechanical Lab Instrumentation
BMSC 667	Introduction to Matlab

Imaging and Signal Processing	
PSYC 653	Introduction to functional magnetic resonance imaging
KAAP 667	Physiological Signal Processing
KAAP 667	Introduction to Brain Imaging
BMEG 643	Magnetic Resonance Imaging
Engineering	
BMEG679	Introduction to Medical Imaging Systems
ELEG 631	Digital Signal Processing
ELEG 632	Mathematical Methods for Signal Processing
ELEG 633	Image Processing
ELEG 634	Signals and Systems
ELEG 668	Detection and Estimation
Data Science, Statistics and Machine Learning	
PSYC 860	Psychological Statistics
PSYC 861	Psychological Statistics
PSYC 878	Hierarchical Linear Modeling
PSYC 879	Structural Equation Modeling
KAAP 602	Data Analysis and Interpretation in Health Sciences
BMSC 686	Mathematics for Biomechanics
BISC 643	Biological data analysis
BINF 601	Introduction to Data Science
BINF 610	Applied Machine Learning
BINF 620	Big Data Analytics in Biomedicine and Health
BINF/CISC 684	Introduction to Machine Learning
ELEG845	Modern Machine Learning
CISC 683	Introduction to Data Mining
CHEG 604	Probability and Statistics for Engineering Problem Solving
CIEG 642	Advanced Data Analysis
ELEG 630	Information Theory
ELEG 845	Modern Machine Learning
ELEG 815	Analytics I: Statistical Learning
ELEG 817	Large Scale Machine Learning
MATH 518	Mathematical Models and Applications
MATH 637	Mathematical Techniques in Data Science
STAT 608	Statistical Research Methods
STAT 609	Regression and Experimental Design
STAT 611	Regression Analysis
STAT 612	Advanced Regression Techniques
STAT 613	Applied Multivariate Statistics
STAT 615	Design and Analysis of Experiments
STAT 616	Advanced Design of Experiments
STAT 617	Multivariate Methods and Statistical Learning
STAT 619	Time Series Analysis

STAT 621	Survival Analysis
STAT 656	Biostatistics
STAT 670	Intro to Stat Analysis I
STAT 671	Intro to Stat Analysis II
STAT 675	Logistic Regression
<i>Computational Biology, Systems Biology and Modeling</i>	
BINF 644	Bioinformatics
BINF 685	Modeling and Simulation for Bioinformatics Systems
BINF 690	Programming for Bioinformatics
BINF 694	Systems Biology I
BINF 695	Computational System Biology
CHEG 621	Metabolic Engineering
CHEG 660	Systems Biology
CISC 636	Computational Biology and Bioinformatics
CISC 844	Computational Biomedicine
ELEG 671	Mathematical Physiology
ELEG 697	Computational System Biology
MATH 660	Introduction to Systems Biology
MATH 529	Fundamentals of Optimization
MATH 611	Introduction to Numerical Discretization
MATH 617	Introductions to Applied Mathematics II
MEEG 862	Advanced Engineering Analysis
<i>Dynamics, Control and Biomechanics</i>	
KAAP 627	Advanced Biomechanics
BMEG 641	Biomechatronics
BMSC 630	Human Movement Control
KAAP 808	Seminar in Motor Behavior
MEEG 612	Biomechanics of human movement
MEEG 621	Linear Systems
MEEG 624	Control of dynamic systems
MEEG 671	Introduction to Robotics
MEEG 677	Introduction to State Estimation
MEEG 682	Clinical biomechanics
MEEG 683	Orthopedic biomechanics
MEEG 685	Control of human movement
MEEG 698	Stochastic Optimal Control
MEEG 829	Applied Nonlinear Control
MEEG 894	Linear Feedback Control Design
<i>Cellular and Molecular Interfaces</i>	
ANFS 671	Paradigms in Cell Signaling
BINF 650	Protein Modifications
BINF 816	Systems Biology of Cells in Engineered Environments
BMEG 610	Tissue Biomechanics & Modeling

BMEG 640	Structural Attachments in Biology
BMEG 662	Engineering Biomedical Nanostructures
BMEG 661	Cell Engineering
BMEG 663	Mechanotransduction
BMEG 665	Tissue Biomechanics and Modeling
CHEG 616	Chemistry and Physics of Surfaces and Interfaces
CHEG 620	Biochemical Engineering
CHEG 621	Metabolic Engineering
CHEG 648	Biomaterials for Drug and Gene Delivery
CHEG 649	Molecular Biophysics
CHEG 842	Selected Topics in Biochemical Engineering
CHEM 641	Biochemistry
CHEM 642	Biochemistry
CHEM 643	Intermediary Metabolism
CHEM 645	Protein Structure and Function
CHEM 646	DNA-Protein Interactions
CHEM 647	Biochemical Evolution
CHEM 648	Membrane Biochemistry
CHEG/CHEM 649	Molecular Biophysics
MEEG 684	Biomaterials and Tissue Eng App
MEEG 686	Cell and tissue transport
MEEG 681	Cytomechanics
MSEG 628	Macromolecular Design & Bioconjugations
MSEG 630	Introduction to Polymer Science and Engineering
MSEG 633/833	Polymer Synthesis and Characterization Laboratory
MSEG 635/835	Principles of Polymer Physics
MSEG 660	Biomaterials and Tissue Engineering
MSEG 803	Equilibria in Materials Systems
MSEG 804	Kinetics in Materials Systems
MSEG 817	Composite Materials
MSEG 823	TEM in Materials Science
MSEG 832	Principles of Polymerization
MSEG/CHEG 601	Structure and Properties of Polymer Materials