

## University of Delaware 4+1 MS Program in Neuroscience

The Department of Psychological and Brain Sciences at the University of Delaware affords exceptional Neuroscience Majors an opportunity to earn both a Bachelor's Degree and a Master's Degree in Neuroscience in just five years of study. The program requires students to fulfill coursework for the B.S. in Neuroscience, coursework for the M.S. in Neuroscience, and complete a research-based masters thesis under faculty supervision.

### Applying to the Program

#### Requirements

Successful applicants to this program must have at least a cumulative 3.0 GPA with a 3.25 GPA in their Neuroscience Major at the end of their junior year. The first step is to identify a faculty member who agrees to serve as the applicant's 4+1 research mentor. We recommend that the applicant work in that faculty member's lab for at least the first semester of your junior year to establish a basis for that faculty member's decision to become your 4+1 research mentor. Once a faculty member has agreed to mentor the applicant's 4+1 research, the applicant should construct an application packet and submit it, by the free add-drop deadline of the second semester of the applicant's junior year (usually the end of the second week of classes) to Dr. Eric Roth, director of the 4+1 Program in Neuroscience. The application packet should include **two Letters of Recommendation** from faculty at the University of Delaware, one of which must be from your 4+1 research mentor. The applicant's application packet should also include a **University of Delaware Transcript**, and a two page **Statement of Purpose**. This statement should discuss anything that might be relevant to an admissions decision and address: a) why the applicant wishes to be admitted to the 4+1 MS Program in Neuroscience, b) the applicant's preparation for the program, c) a brief summary of the research project the applicant expects to complete, and d) plans after receiving the Master's Degree.

#### Admission Procedure

Neuroscience Majors who properly submit their application materials for the 4+1 Program in Neuroscience will have their application materials reviewed by the Neuroscience Admissions Committee comprised of the Behavioral Neuroscience Faculty who, in turn, make a recommendation to the Director of Graduate Studies in the Department of Psychological and Brain Sciences for final approval of admission. Applicants are generally notified of their admission status within 30 days of their application. One should note however that: a) admission is competitive, so meeting the minimal requirements for admission will not guarantee admission, and b) junior year admission to the 4+1 Program in Neuroscience is **provisional** until the applicant satisfies his or her Senior Year Evaluation as per below. The GRE is not required for admission to the 4+1 Program in Neuroscience. However, applicants who are not U.S. citizens or permanent residents must complete the Test of English as a Foreign Language (TOEFL) with a score of 550 or higher on the paper-based test or 79 or higher on the Internet-based test. Previous education, training, or residence in the U.S. does not exempt foreign nationals from

these requirements. Applicants who need further training in English prior to attending graduate school may apply for admission through the University of Delaware English Language Institute's Conditional Admission Program.

### **Senior Year Evaluation**

Students provisionally enrolled in the 4+1 Program in Neuroscience must maintain at least a 3.25 GPA in their Neuroscience courses through the first semester of their senior year, and must be reevaluated by the admissions committee the *beginning of the second semester of their senior year*. This evaluation, which is based on GPA and level of senior year research engagement, is conducted by the Director of the 4+1 Program in Neuroscience in consultation with the student's 4+1 mentor, and is subject to final approval by the Director of Graduate Studies in the Department of Psychological and Brain Studies. Students who are permitted to continue in the 4+1 Program must be eligible to receive their BS Degree in Neuroscience from the University of Delaware at the end of their senior year, and must immediately complete an online application to the School of Graduate Studies at the following address:

<http://www.udel.edu/gradoffice/apply/index.html>. The latter is necessary to allow one to be promoted to **graduate student status** so one can register for the required *Summer Research Residency* and *Fifth Year of Graduate Studies*. For students who are granted permission to continue, this final application procedure, albeit required, is largely a formality.

## **Academic Requirements**

### **Senior Year Research**

In addition to completing the requirements for the B.S. degree in Neuroscience, students provisionally accepted into the 4+1 Program in Neuroscience must register for three credits of undergraduate research per semester (NSCI368) during their senior year. This undergraduate neuroscience research must be conducted in your 4+1 research mentor's laboratory, and is usually technique-focused and exploratory in nature. However, it is often used also to satisfy the requirements for a Senior Thesis if the student so chooses, and is the foundational "pilot work" that the 4+1 Neuroscience student exploits to set up a successful 4+1 Master's Degree Thesis Proposal and Research Project, as per below.

### **Summer Research Residency**

Upon completing the Bachelor's Degree in Neuroscience and achieving graduate student status, as per above, students admitted into the 4+1 Program in Neuroscience transition immediately into their Summer Research Residency, for which they must register for six credits of *graduate research in neuroscience* (NSCI868). This step is particularly important since summer is a time when graduate students and their faculty mentors can devote the greatest amount of undistracted time and attention to research, particularly to the gathering and analysis of data for one's Master's thesis

research. During their Summer Research Residency, 4+1 students must write and defend their Master's Degree Proposal, described below, and initiate their Master's Thesis Research.

### **Master's Degree Proposal**

Any time prior to the start of the 5<sup>th</sup> year of studies, students will: a) present a concisely written thesis proposal to their Masters Thesis Committee and defend it orally. The Thesis Committee shall consist of the student's faculty mentor and at least two other members of the faculty, including at least one Behavioral Neuroscience faculty member within the Department of Psychological and Brain Sciences. Faculty from other departments or colleges within or outside the University may also serve as a research mentor and serve on the student's thesis committee, by mutual agreement of all parties involved and subject to approval by the Director of Graduate Studies in the Department of Psychological and Brain Sciences.

### **Fifth Year of Graduate Studies & Research**

During their fifth year of studies, students in the 4+1 Neuroscience Program take 10 credit hours of additional graduate course work in neuroscience, as given below, and complete 20 credit hours of additional graduate research in neuroscience, plus complete the Master's Thesis Research that they initiated and pursued during their Summer Research Residency. Hence, upon graduation, students in the 4+1 Neuroscience Program will have completed 10 credits of graduate course work in neuroscience and 20 credit hours of research in neuroscience (6 during the Summer Research Residency and 14 during the fifth year), for a total of 30 graduate credits beyond the Bachelor's Degree in Neuroscience. Please note that neuroscience courses that were taken as an undergraduate cannot be taken again or credited toward graduate work.

### **Neuroscience Colloquia**

Students in the 4+1 Neuroscience Program are required register for one credit of NSCI866 each fall and spring semester, and regularly attend the Neuroscience "Brown Bag" Colloquia and Seminar Series that meet for one hour each week. These colloquia and seminars are an important forum for faculty, graduate students, and invited guests to present and discuss recent research.

### **Master's Thesis Completion**

The culmination of a successful Master's Thesis research project results in a written Master's Thesis. Expectations for the Master's Thesis research is established by a student's faculty mentor with oversight by the student's thesis committee and must be approved by the Director of Graduate Studies. Students in the 4+1 Neuroscience Program are required to register for two credits of NSCI869, Masters Thesis, during the spring semester of their fifth year. In order to allow for final revision and submission of the document in time to apply for the June graduation, the Neuroscience Master's Thesis must be submitted to, and orally defended in front of, the students Master's Thesis Committee by April 15th of the second semester of the fifth year.

## **Advisement and Financial Aid**

### **Advisement**

Primary advising for students enrolled in the 4+1 Program in Neuroscience will be the responsibility of the student's faculty research mentor.

### **Financial Aid**

Neuroscience Majors who are receiving scholarships or other forms of financial aid as an undergraduate are advised that such aid applies only toward the completion of the Bachelor's Degree or to the first four years of their undergraduate studies (which may nonetheless include taking some graduate courses during their senior year). Thus, students who pursue the 4+1 Program in Neuroscience may want to seek support for their *Summer Research Residency* and *Fifth Year of Graduate Study* through student loans and other financial aid. A limited amount of support is sometimes available to 4+1 Program students through the research support of their faculty mentor, or on a competitive basis from other sources.

## Neuroscience 4+1 Curriculum

Summer Research Residency	
NSCI868: Summer Research	6 credits
Master's Thesis Proposal	0 credit
First Semester of 5 <sup>th</sup> Year	
NSCI6xx Neuroscience <i>Core Course</i>	3 credits
NSCI868 Neuroscience Research	8 credits
NSCI866 Neuroscience Colloquium	1 credit
Second Semester of 5 <sup>th</sup> Year	
NSCI6xx Neuroscience <i>Core or Elective Course</i>	3 credits
NSCI868 Neuroscience Research	6 credits
NSCI866 Neuroscience Colloquium	1 credit
NSCI869 Master's Thesis	2 credits

### List of Graduate Neuroscience Courses (for a description click on course titles)

#### Core Courses

[NSCI 626 Neuroanatomy](#)

[NSCI 627 Neurophysiology](#)

[NSCI 628 Neuropharmacology](#)

#### Elective Courses

[NSCI 629 Integrative Neuroscience I](#)

[NSCI 630 Integrative Neuroscience II](#)

[NSCI 631 Current Topics in Neuroscience](#)

[NSCI 634 Stress and the Brain](#)

[NSCI 635 Neuroplasticity](#)

[NSCI 636 Spatial Cognition](#)

[NSCI 637 Behavioral Epigenetics](#)

[NSCI 638 Clinical Neuropsychology](#)

[NSCI 639 The Emotional Brain](#)

[NSCI 640 Immune System and Behavior](#)

[NSCI 641 Hormones and Behavior](#)

[NSCI 642 Social Neuroscience](#)

[NSCI 643 Body and Space](#)

[NSCI 667 Varied Topics](#)

[BISC 639 Developmental Neurobiology](#)