

## Neuroscience

PROFESSOR **Griffin** (Biology), Director. PROFESSOR **Hunt** (Psychology), Associate Director.

### The Major

Neuroscience is a formalized program within the interdisciplinary studies major. Students must declare this major before the beginning of preregistration for the first semester of their junior year by contacting Professor Hunt in the Psychology Department, Professor Griffin in the Biology Department or Professor Schwartz (Director of Interdisciplinary Studies, Charles Center).

### The Discipline

Neuroscience is a rigorous interdisciplinary study of the nervous system. It integrates the function of molecules, cells and networks as they give rise to fully formed behavioral and cognitive processes. Neuroscience training is founded in the molecular mechanisms of cellular physiology and the unique properties of neural excitable membranes and of signaling. These fundamental concepts provide the basis for understanding complex responses to internal and external environments.

### Program Objectives:

1. To provide training for advanced study in biomedical fields including, physiology, pharmacology, bioengineering, and medicine.
2. To provide students the opportunity to participate in original research.
3. To promote an interdisciplinary approach to scientific problem solving through the curriculum, symposia, and informal neuroscience-related events.

### For success in the Neuroscience Program a student must:

1. Perform at a high level in introductory coursework for Biology, Chemistry, Mathematics, Psychology, and Physics.
2. Master the concepts presented in the required coursework, and their interdisciplinary application to neuroscience.
3. Develop a clear focus in elective coursework.

Students who have successfully completed this program are prepared for graduate study, careers in academic and biomedical research, medicine, and health care related fields.

### Requirements for Major

**Required Credit Hours:** A minimum of 38 (plus 20 credit hours in prerequisites). Alterations in the prescribed curriculum, while not encouraged, may be petitioned to the Committee on Honors and Interdisciplinary Studies. The major writing requirement is satisfied by passing NSCI 300 Writing in the Neurosciences.

### Prerequisite Courses

CREDITS	COURSE
4	BIOL 203 Principles of Biology: Molecules, Cells, Development
4	BIOL 204 Principles of Biology: Organisms, Ecology, Evolution
3	CHEM 103 General Chemistry I
3	CHEM 206 Organic Chemistry I
3	PSYC 201 Introduction to Psychology as a Natural Science
3	PSYC 301 Elementary Statistics, MATH 106 Elementary Probability and Statistics, or KINE 394 Statistics and Evaluation

### Required Courses

CREDITS	COURSE
3	BIOL 345 Neurobiology
3	BIOL 406 Molecular Cell Biology
3	CHEM 307 or 209 Organic Chemistry II
3	CHEM 308 General Chemistry II, 305 Inorganic Chemistry, or 335 Principles of Inorganic Chemistry

4	PHYS101 or 107 General Physics I
4	PHYS102 or 108 General Physics II
3	PSYC 313 Physiological Psychology
3/4	KINE 304 Human Physiology, BIOL 432 Animal Physiology, or PSYC 317 Sensation and Perception

A major must also complete at least four additional courses. At least one course must be chosen from the Behavioral Neuroscience group and at least one course must be chosen from the Cell/Systems Neuroscience group (see below). One of the remaining two electives may be satisfied with an undergraduate research experience (APSC 401/402, BIOL 403, CHEM 409, KINE 480/481, PSYC 491) for at least 3 credits. Research counting as an elective in the program must be conducted under the supervision of a Neuroscience faculty member (see <http://www.wm.edu/neuroscience/directorya.php> for a current listing).

### Behavioral Neuroscience Courses

CREDITS	COURSE	
3	BIOL 410	Animal Behavior
4	PSYC 302	Experimental Methods
3	PSYC 311	Cognitive Psychology
3	PSYC 315	Foundations of Learning and Memory
3	PSYC 319	Cognitive Science
4	PSYC 413	Research in Physiological Psychology
4	PSYC 415	Comparative Psychology
3	PSYC 445	Psychopharmacology
3	PSYC 447	Cognitive Neuroscience

### Cell/Systems Neuroscience Courses

CREDITS	COURSE	
3	APSC 431	Applied Cellular Neuroscience
3	APSC 432	Applied Systems Neuroscience
3	APSC 451	Cellular Biophysics and Modeling
3	BIOL 415	General Endocrinology
3	BIOL 433	Developmental Biology
3	BIOL 442	Molecular Genetics
4	BIOL 447	Neurophysiology
3	CHEM 417	Neurochemistry
3	KINE 450	Cardiovascular Physiology
3	KINE 485	Cellular and Biochemical Effects of Exercise

**300. Writing in the Neurosciences.** Students majoring in Neuroscience fulfill the major writing requirement by working with an individual faculty member, typically in a lecture or research course. Lecture courses that offer sections of NSCI 300 are PSYC 302, PSYC 413, PSYC 415, BIOL 433, BIOL 442 and CHEM 417. Declared majors should discuss the writing requirement with a faculty member during the first two weeks of the semester during which they would like to fulfill this requirement. Once accepted by a faculty member, the student will be given permission to enroll in the proper section of NSCI 300 by the faculty member. Students must register for this course during the add/drop period.

**495-496. Honors in Neuroscience.** Neuroscience Honors students complete empirically-based research projects that are conducted under the supervision of a Neuroscience faculty member. Intention to pursue honors must be filed with the Charles Center no later than the first day of classes of the semester in which the student will begin their thesis. This is usually the fall semester of their senior year (two semesters before graduation). In order to graduate with a degree with Honors in Neuroscience a student must (a) complete a written thesis that will be submitted to the honors examination committee at least two weeks before the last day of classes and (b) pass, with satisfactory performance, a comprehensive oral examination. For College provisions governing admission to Honors, see the catalog section titled Honors and Special Programs. For additional requirements see the Neuroscience website.

Please visit the Program website for further information and updates. <http://www.wm.edu/neuroscience/>.