

INTERDEPARTMENTAL MAJOR IN NEUROSCIENCE (Departments of Psychology & Biology)

The interdepartmental major in Neuroscience is co-sponsored by the Departments of Psychology and Biology for students having a strong interest in the field of Neuroscience. The major fulfills the standard pre-med requirements and provides excellent preparation for professional programs in medicine, osteopathy, dentistry, veterinary science, optometry, pharmacy and physical therapy. The major also prepares students for graduate programs in neuroscience, biopsychology, neuropsychology, physiology, pharmacology and anatomy, as well as for positions in the pharmaceutical and biotechnology industries.

Over the past three decades, neuroscience has emerged as a coherent, independent discipline, fostered by the establishment of an international professional society, the Society for Neuroscience. To obtain an idea of how the field has progressed and the opportunities for neuroscience education in nearly 200 colleges and universities, consult the latest edition of Neuroscience Training Programs in North America published by the Association of Neuroscience Departments and Programs, Washington, D.C.

The Field of Neuroscience

Neuroscience is the study of the nervous system and the behavior it generates. Neuroscientists are concerned not only with the structure and function of nerve cells, but also with the brain mechanisms of learning, memory, emotions, sensory and motor functions, perception, cognition, and other mental processes. In addition, neuroscientists explore disorders of brain function that lead to conditions such as schizophrenia, Parkinson's and Alzheimer's disease.

Course of Study

The interdepartmental major emphasizes the neuroscience components of biology and psychology. Since Neuroscience is an interdisciplinary field, encompassing both the biological and psychological aspects of the nervous system, the student is provided with a broader perspective than would be gained from a major in one traditional discipline.

Students study the fundamentals of biology, chemistry, physics and calculus. These form a scientific foundation to the material presented in other courses in the major that focus on the structure and function of the nervous system and its relationship to behavior and mental processes.

Additional Information

For more information about this major, please contact Dr. Carlisle Skeen in Psychology (skeen@udel.edu), or Dr. David Smith in Biology (dwsmith@udel.edu).

Course Requirements

Credits

I. Major Requirements:

Total **46**

A. Core Courses.

Total 20-21

1. Biology (8)

BISC 207	Introductory Biology I	4
BISC 208	Introductory Biology II	4

2. Psychology (6)

PSYC 100	General Psychology	3
PSYC 209	Measurement & Statistics	3

3. Neuroscience (6-7)

PSYC 320	Introduction to Neuroscience	3
PSYC 367	Neuroscience Lab Experience	1*
PSYC 414	Drugs and the Brain	3

* [This lab requirement may also be satisfied by: 1) completing the lab component of the 4-credit *Neuroanatomy* course, PSYC 626, B3 below, or 2) completing a *Special Problems Research* course (with prior approval) in a neuroscience research laboratory, C below]

B. Advanced Courses.

Total 19-20

1. Biology (10)

BISC 306	General Physiology	3
BISC 316	Experimental Physiology	2
<i>(And one of the following lecture + lab courses)</i>		
BISC 305	Cell Physiology +	3
BISC 315	Experimental Cell Physiology	2

(Or)

BISC 401	Molecular Biology of the Cell +	3
BISC 411	Experimental MB of the Cell	2

2. Psychology (6)

> *Two of the following:*

PSYC 310	Sensation & Perception	3
PSYC 312	Learning & Motivation	3
PSYC 340	Cognition	3

3. Neuroscience (3-4) > *One of the following:*

PSYC 626	Neuroanatomy	4
PSYC 627	Neurophysiology	3
PSYC 628	Neuropharmacology	3
PSYC 667	Integrative Neuroscience	3
PSYC 630	Neurons and Networks	3
BISC 639	Developmental Neurobiology	3

C. Elective Courses

(All at or above 300-level).

Total 6

3 from BISC and 3 from PSYC (6)*

*[These credits may include *Special Problems Research* courses in a neuroscience faculty member's research laboratory]

II. Extra-departmental Requirements		Total 27
PHYS 201/202	General Physics I & II	8
CHEM 103/104	General Chemistry I & II	8
CHEM 321/322*	Organic Chemistry I & II	8
MATH 221**	Calculus I	3

*[Students may take CHEM 213 (Elementary Organic Chemistry) and CHEM 214/216 (Elementary Biochemistry) instead of CHEM 321/322-- *but doing so will not satisfy the pre-med requirements.*]

**[Students interested in the more quantitative areas of neuroscience, such as computational neuroscience, should also take MATH 222 (Calculus II).]

III. College & University Requirements		Total 54
English, Writing, Multi-cultural		9
Foreign Language		12
Breadth – Groups A,B,C,D*		33

*[Students in the College of Arts and Science must satisfy the breadth requirements of 12 credits in each of the four groups. Because PSYC 201 satisfies 3 credits from Group C, and the natural science courses required for this interdepartmental major satisfy all 13 of the Group D credits, there remain 33 credits to fulfill.

Total credits for graduation = 127

Course Prerequisites

<u>Course</u>	<u>Prerequisites</u>
PSYC 300-level and above	PSYC 100, PSYC 209
BISC 300-level and above	BISC 207/208 + 2 semesters of chemistry
PSYC 626 Neuroanatomy	PSYC 320
PSYC 667 Integrative Neuroscience	PSYC 320
PSYC 630 Neurons and Networks	PSYC 320
PSYC 627 Neurophysiology	PSYC 320 + 2 years of Chemistry
PSYC 628 Neuropharmacology	PSYC 320 + 2 years of Chemistry
BISC 639 Developmental Neurobiology	PSYC 320 + 2 years of Chemistry

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