Neuroscience and Behavior

The major in neuroscience and behavior is administered by the Neuroscience and Behavior Committee: Professors Barry (biological sciences), Binder (psychology and education, chair); Gillis (biological sciences), Hollis (psychology and education), Millard (psychology and education); Associate Professors Bacon (biological sciences); Assistant Professors Breen (psychology and education; on leave Fall 2015), Colodner (neuroscience and behavior), McMenimen (chemistry; on leave 2015-16); Visiting Assistant Professor Schwartzer (psychology and education); Visiting Lecturer Tanner (biological sciences).

Overview

The program in neuroscience and behavior is intended for students with strong, integrative interests in both biological sciences and psychology and in the biological bases of behavior.

Contact Info

Dianne Baranowski, senior administrative assistant
Katherine Binder, chair

Requirements for the Major

Credits

- A minimum of 52 credits

Courses

Required core curriculum:

- Neuroscience 100, Introduction to Neuroscience & Behavior
- Chemistry 101, General Chemistry, or Chemistry 160, Integrated Introduction to Biology and Chemistry
- Chemistry 201, General Chemistry II
- Chemistry 202, Organic Chemistry
- Mathematics 101, Calculus I
- Psychology 200, Research Methods in Psychology
- Biological Sciences 200, Introduction to Biology II
- Biological Sciences 220, Cell Biology
- Biological Sciences 333, Neurobiology
- A course in quantitative inference:
  - Psychology 201, Statistics
  - Statistics 240, Elementary Data Analysis and Experimental Design

Two laboratory-based courses at the 300 level must be selected from the following:

- Biological Sciences 311, Protein Biochemistry and Cellular Metabolism
- Biological Sciences 315, Behavioral Ecology
- Biological Sciences 322, Comparative Biomechanics
- Biological Sciences 328, Human Physiology
- Biological Sciences 335, Mammalian Anatomy
- Psychology 340EL Laboratory in Perception and Cognition: Human Electrophysiology
- Psychology 350, Laboratory in Behavioral Neuroscience
- Computer Science 334, Artificial Intelligence
- Neuroscience 395, Independent Study (4 credits)

A third 300-level course from the preceding list, or from the following:

- Neuroscience 330, Biology of Neurological Diseases
- Biological Sciences 321AM, Conference Course: Art Music and the Brain
- Psychology 359, Seminar: Biological Bases of Behavior

Other

- More Students planning postgraduate study in a related discipline or in medicine are urged to participate in independent laboratory research within either or both departments.

Neuroscience and behavior is an interdisciplinary major. Students who pursue an interdisciplinary major automatically fulfill the College’s "outside the major" requirement.

Course Offerings

NEURO-100 Introduction to Neuroscience and Behavior
Fall and Spring
This comprehensive survey course explores the brain and the biological basis of behavior. We will examine the anatomy of the nervous system and the unique properties of the cells that make up the brain. We will discuss the mechanisms by which individual brains cells communicate with each other, and how small networks of cells underlie more complex processes such as perception, learning, and behavior. In labs, students will perform experiments that expand upon and reinforce these ideas through hands-on exercises.

Applies to requirement(s): Math & Sciences
K. Colodner
Restrictions: This course is limited to first-year students.
Coreq: NEURO-100L.
Credits: 4

NEURO-295 Independent Study
Fall and Spring
The department
Instructor permission required.
Credits: 1-4
Course can be repeated for credit.

NEURO-321 Conference Course:

NEURO-324 Cellular and Molecular Neuroscience
Spring
This course will explore cellular and molecular mechanisms of nervous system development and function through lectures, laboratory exercises, and the critical analysis of primary literature. Topics include synapse formation and synaptic transmission, neuronal-glial interactions, the molecular basis of behavior, and applied genetic engineering techniques.

Applies to requirement(s): Math & Sciences
K. Colodner
Prereq: Neuroscience 100 and Biological Sciences 220
Notes: This course meets the 300-level laboratory-based course requirement for the Neuroscience and Behavior major.
Credits: 4

NEURO-330 Biology of Neurological Diseases
Not Scheduled for This Year

Biology of Neurological Diseases will explore the molecular and cellular basis of neurological diseases. We will investigate the biological mechanisms underlying neurodegenerative diseases, such as Alzheimer’s disease. We will focus on animal models used to investigate pathogenic mechanisms and the biology
underlying therapeutic strategies. This class will rely heavily on primary research articles and in-class discussions.

 Applies to requirement(s): Meets No Distribution Requirement

 K. Colodner

 Prereq: Biological Sciences 210, Biological Sciences 220 and Psychology 250 or Neuroscience 100.

 Credits: 4

 NEURO-395 Independent Study

 Fall and Spring

 The department

 Instructor permission required.

 Credits: 1-8

 Course can be repeated for credit.

 See Also

 - Cognitive Neuroscience