

# NEUROSCIENCE (BI-CO)

## Department Website:

<https://www.haverford.edu/neuroscience>

The desire to understand human and animal behavior in terms of nervous system structure and function is longstanding. Historically, researchers and scholars have approached this task from a variety of disciplines, including medicine, biology, psychology, philosophy, and physiology. The field of neuroscience emerged as an interdisciplinary approach, combining techniques and perspectives from these disciplines, as well as emerging fields such as computation and cognitive science, to yield new insights into the workings of the nervous system and behavior.

The Major and Minor in Neuroscience advance two overlapping but distinct sets of learning goals, which are explained in turn below.

## Learning Goals

### Neuroscience Major

The **major** in Neuroscience allows students to pursue an in-depth study of the nervous system and behavior across disciplines. Students should consult with the Neuroscience Director or any member of the faculty advisory committee in order to declare the major.

The goals of the major include enabling students to gain:

- Training in cognate disciplines that are fundamental to the study of neuroscience
- An in-depth understanding of the organization of the nervous system and its relation to categories of behavior such as motor control, sensation and perception, motivational states, and higher cognition.
- fluency with the many levels at which the nervous system can be studied, including molecular, cellular, systems, behavioral and cognitive neuroscience levels.
- an ability to closely examine and critically evaluate primary research on specialized, advanced neuroscience topics.
- an appreciation of the interdisciplinary nature of neuroscience and the allied disciplines that inform the study of mind, brain, and behavior.
- Experience with neuroscience laboratory skills and the design and analysis of neuroscience experiments.

### Neuroscience Minor

The **minor** in Neuroscience allows students with any major to pursue interests in behavior and the nervous system across disciplines. Students should consult with the Neuroscience Director or any member of the faculty advisory committee in order to declare the minor.

The goals of the minor include enabling students to gain:

- a basic understanding of the organization of the nervous system and its relation to categories of behavior such as motor control, sensation and perception, motivational states, and higher cognition.
- an appreciation of and fluency with the many levels at which the nervous system can be studied, including molecular, cellular, systems, behavioral and cognitive neuroscience levels.
- an appreciation of the interdisciplinary nature of neuroscience and the allied disciplines that inform the study of mind, brain, and behavior.
- an ability to closely examine and critically evaluate primary research on specialized, advanced neuroscience topics.

Haverford's Institutional Learning Goals are available on the President's website, at <http://hav.to/learninggoals>.

## Major Requirements

- Introduction to Neuroscience (1 credit)
  - NEUR H100
- Foundational Science Courses (4 credits)
  - 1 semester of General Chemistry (CHEM H111, CHEM H113, CHEM H115, CHEM B103)
  - 1 semester of Introductory Biology (BIOL H200A, BIOL H201B with instructor approval, BIOL B110 or BIOL B111)
  - 1 semester of Introductory Psychology (PSYC H100 or PSYC B105)
  - 1 semester of Statistics (PSYC H200, PSYC B205; MATH H103 or MATH H203, MATH B104, or ECON H203)
- Upper-level Neuroscience Courses with Breadth Requirement (4 credits)
  - Students must take 4 credits of upper-level neuroscience courses
  - Upper-level Neuroscience courses are divided into three categories: Cellular/Molecular, Behavioral/Systems, and Cognitive. Students must take courses from at least two of the three categories to fulfil the breadth requirement.
  - A list of approved courses and their categories is linked from the Neuroscience website.

- Laboratory Coursework in Neuroscience (1 credit)
  - In order to gain hands-on experience with some of the tools, methods, and paradigms of Neuroscience, majors are required to take 1 credit of neuroscience laboratory coursework. This can be accomplished in several ways (e.g., 2 half-credit psych labs, 1 full-credit psych lab, 1 full-credit neuroscience SuperLab).
  - A list of approved laboratory courses is linked from the Neuroscience website.
- Thesis or Capstone in Neuroscience (1 credit)
  - To culminate their experience as a Neuroscience major, students are required to complete one course of thesis or capstone work. This may take the form of a 2-semester laboratory thesis project or a 1-semester capstone course.

## Minor Requirements

- One approved “gateway” course:
  - HC NEUR H100 (Introduction to Neuroscience),
  - HC PSYC H217 (Behavioral Neuroscience) or BMC PSYC B218 (Behavioral Neuroscience)
  - BIOL B202 (Introduction to Neuroscience).
- Five credits from the list of approved courses, with these constraints:
  - The five credits must sample from three different disciplines.
  - At least three of the five credits must come from List A: Primary Neuroscience courses
  - At least one of the credits must be at the 300-level or higher.
  - One of the five credits may come from supervised senior research in neuroscience.
  - No more than two of the six minor credits may come from institutions outside of the Bi-Co.

A current list of approved courses, divided into List A: Primary Neuroscience and List B: Allied Disciplines, is linked from the Neuroscience Minor website.

## Faculty at Haverford

### Laura Been

Assistant Professor of Psychology, Coordinator of Neuroscience

### Rebecca Compton

Professor and Chair of Psychology

### Robert Fairman

Professor of Biology

### Roshan Jain

Assistant Professor of Biology

### Mary Ellen Kelly

Visiting Assistant Professor of Psychology

### Patrese Robinson-Drummer

Visiting Assistant Professor of Psychology and Post-Doctoral Fellow

### Seol Hee Im

Visiting Assistant Professor of Biology

## Faculty at Bryn Mawr

### Dustin Albert

Assistant Professor of Psychology

### Peter Brodfuehrer

Emeritus Professor of Biology

### Andrew Gargiulo

Bucher Jackson Post-Doctoral Fellow in Psychology

### Laura Grafe

Assistant Professor of Psychology, Coordinator of Neuroscience

### Karen Greif

Emeritus Professor of Biology

### Anjali Thapar

Professor of Psychology

### Earl Thomas

Emeritus Professor of Psychology