

# NEUROSCIENCE (B.A.)

The field of neuroscience is highly interdisciplinary and has been built from many different areas of study. A well-rounded education in neuroscience includes investigations into the molecular, cellular, and genetic aspects of nervous system functioning as well as their influences on behavior. The neuroscience curriculum at Keene State mirrors the interdisciplinarity of the field. The core of the neuroscience major draws courses from biology, chemistry, and psychology. Students may also take elective courses from Computer Science, Health Science, Math, Philosophy, and Physics

The major places a strong emphasis on direct research experience within neuroscience, with each student conducting a research project as part of the major. In addition, the neuroscience major creates an environment where faculty and students work collaboratively and discuss current issues in neuroscience.

The curriculum spans a diverse course of study incorporating the interdisciplinary nature of a liberal arts education and a rigorous study of subjects, such as:

- The regions of the brain
- Circuits in the brain
- The function of neurons
- The effects and influences of the brain on behavior
- Research methodologies
- The molecular, cellular, and genetic characteristics of the nervous system.

## Integrative Studies Requirements

40 credits

Code	Title	Credits	Completed
<b>Major Requirements (56 credits)</b>			
<i>Core Courses (32 Credits)</i>			
INBIO-110	Cells and Molecules	4	_____
INBIO-111	Evolution & Ecology	4	_____
ISPSYC-101	General Psychology	4	_____
INCHEM-111	General Chemistry	4	_____
CHEM-112	Gen Chemistry II	4	_____
PSYC-252	Research Meth Psyc	4	_____
PSYC-253	Brain & Behavior	4	_____
MATH-141	Introductory Statistics	4	_____
or PSYC-251	Psychological Statistics		_____
<i>Research Courses (4 Credits)</i>			
PSYC-498	Independent Study	4	_____
<i>Capstone (4 Credits)</i>			
PSYC-475	Human Psychophysiology	4	_____
<i>Foundation Courses</i>		8	_____

Select <b>two</b> of the following:		_____
BIO-311	Genetics	_____
BIO-312	Cell Biology	_____
BIO-382	Neurobiology	_____
BIO-445	Animal Behavior	_____
PSYC-453	Sensation & Perception	_____
PSYC-457	Cognitive Neuroscience	_____
<i>Elective Courses (8 Credits)</i>		8 _____
Select two additional 200/300/400 level courses from one or more of the following disciplines (can include ISP courses, not including independent studies or practica 298/498)		_____
Biology (BIO)		_____
Chemistry (CHEM)		_____
Computer Science (CS)		_____
Health Science (HLSC)		_____
Math (MATH)		_____
Philosophy (PHIL)		_____
Physics (PHYS)		_____
Psychology (PSYC)		_____
<b>Total Credits</b>		<b>56</b> _____

## Electives

Select courses to reach a total of 120 credits.

## Degree Requirements

120 credits

40 credits at the upper-level

## Neuroscience Honors Program

Motivated neuroscience students may participate in an advanced program of research culminating in graduation with Honors in Neuroscience. This program allows students to pursue supervised research or applications of neuroscience principles in greater depth than provided in course offerings. Students electing to participate in this program complete all requirements for the Neuroscience BA or BS major plus 1 credit of PSYC-396 Junior Honors Seminar, 2 credits of PSYC-496 Honors Seminar and 6 credits of PSYC-499 Honors Research during the two semesters of the senior year. These credits are in addition to open elective credits used to fulfill the requirements for the Neuroscience major.

### Admission to the Honors Program is based on:

- Self-nomination after the Fall Semester of the Junior year with an overall grade point average of 3.20.
- Completion of the core requirements of the Neuroscience major at the time of, or concurrent with, enrollment in PSYC-396 Junior Honors Seminar.
- Support of an Honors Committee consisting of a faculty sponsor and two other faculty members. The primary mentor must be from the department of psychology or a person on the list of Neuroscience affiliated faculty. The Honors Committee will review the student's

project proposal at the completion of PSYC-396 Junior Honors Seminar.

**At the end of the senior year, each participant:**

- Submits a final written report on the Honors work for approval by their Honors Committee.
- Presents the results of their work and responds to questions about the project and its relationship to the larger body of neuroscience knowledge, in a colloquium open to the public.
- The student's Honors Committee votes on whether or not to accept the Honors project.
- Students successfully completing all facets of the Honors Program and having an average of 3.20 overall and 3.20 in courses for the neuroscience major will graduate with Honors in Neuroscience.

## **Upon completion of the Neuroscience B.A. degree, students will:**

- Gain the theoretical background necessary for exploring the fundamental questions that neuroscience researchers in the fields of biology, chemistry and psychology ask when studying the brain.
- Develop familiarity with major theories and research methodologies that underlie current neuroscience research.
- Learn the major topics involved in an understanding of the neuroscientific foundations of human and animal behavior and how the central and peripheral nervous systems as well as the endocrine system relate to these behaviors.
- Be able to develop testable hypotheses, design experiments to test hypotheses and conduct experiments including data collection, analysis, interpretations and presentation. They will also be able to effectively search computer databases for relevant literature (primary and secondary) on scientific topics.
- Understand and be able to critically evaluate research literature in neuroscience.
- Engage in academic activities that support the important interdisciplinary connections in neuroscience research and theories.