

NEUROSCIENCE IN THE COLLEGE OF ARTS AND SCIENCES

<https://www.uvm.edu/cas/neuro>

Neuroscience is the study of the function of the nervous system and how it regulates behavior. Often described as one of the "last frontiers," neuroscience is an exciting and challenging interdisciplinary field in which scientists share an interest in studying the anatomy, physiology, and function of the nervous system. Psychological science and biology have been traditional disciplines that share this interest, but fields such as communication sciences, physics, computer science, and other diverse fields are also intensely interested in neuroscience. The interdisciplinary nature of neuroscience requires an understanding of a broad range of methods of inquiry, ranging from laboratory methods associated with basic "bench" sciences such as cell and molecular biology to clinical methods associated with the study of medical disorders or disease states.

COLLEGE OF ARTS AND SCIENCES NEUROSCIENCE B.A. AND B.S.

The neuroscience program at UVM is a cooperative effort by faculty in the Departments of Biology, Psychological Sciences, Communication Sciences & Disorders, Neurological Sciences, and neuroscientists in other departments throughout UVM. The challenging curriculum of both majors is driven by the nature of the breadth of the field of neuroscience, the unique opportunities provided by course offerings and by faculty expertise. It features a strong life science foundation, research methods and experiences, and a strong core of neuroscience courses that span cellular and molecular to behavioral and cognitive content. These include many courses in at multiple levels of neuroscience that are unique to UVM and offered by multiple departments in three different colleges. The curriculum gives students the freedom to select advanced courses that will prepare them for a wide variety of post-graduation career options, including (but certainly not limited to) graduate study, medical school and other health-care career options, laboratory technician positions, science writing, and more. The Bachelor of Arts is designed for students who wish to double major or minor in programs outside neuroscience, and the Bachelor of Science is designed for students who want to go deeper into the field of neuroscience by diving into more upper-level electives.

NEUROSCIENCE MINOR

The neuroscience minor was created for students who have a core interest in another major and are interested in neuroscience as either a supplement to their major or as simply a field of inquiry that they enjoy studying. The minor was designed to introduce students from multiple backgrounds to the interdisciplinary field of neuroscience.

MAJORS

NEUROSCIENCE MAJOR

Neuroscience B.A.

Neuroscience B.S.

MINORS

NEUROSCIENCE MINOR

Neuroscience

GRADUATE

Neuroscience M.S.

Neuroscience Ph.D.

See the online Graduate Catalogue for more information.

Courses

NSCI 1010. Topics In: First-Year Seminar. 3 Credits.

Intensive first-year seminar focused on specific themes and/or disciplinary perspectives. Emphasis on developing critical reading and writing skills, substantive revision, information literacy, and analytical thinking. First-year seminars are frequently organized to meet one of the disciplinary Catamount Core requirements. Topics vary by offering; periodic offering at intervals that may exceed four years. Catamount Core: WIL1.

NSCI 1020. Topics In: LASP Writing. 3 Credits.

Intensive course in a broad disciplinary area (humanities, social sciences, arts, or natural sciences). Part of an integrated first-year experience in which students take 2-4 classes exploring aesthetic, humanistic, social, linguistic, environmental, or scientific issues. May repeat for credit with different content. Topics vary by offering; periodic offering at intervals that may exceed four years. Co-requisite: Enrollment in the appropriate Liberal Arts Scholars Program. Catamount Core: WIL1.

NSCI 1025. Topics In: LASP Seminar. 3 Credits.

Intensive course in a broad disciplinary area (humanities, social sciences, arts, or natural sciences). Part of an integrated first-year experience in which students take 2-4 classes exploring aesthetic, humanistic, social, linguistic, environmental, or scientific issues. May repeat for credit with different content. Topics vary by offering; periodic offering at intervals that may exceed four years. Co-requisite: Enrollment in the appropriate Liberal Arts Scholars Program.

NSCI 1070. First-Year NSCI Seminar. 1 Credit.

Introduces first-year neuroscience majors to the field of neuroscience by introducing students to different perspectives and subfields through researchers and students at UVM.

NSCI 1990. Special Topics. 1-18 Credits.

See Schedule of Courses for specific titles.

NSCI 2100. Exploring Neuroscience w/lab. 0 or 4 Credits.

In-depth survey of neuroscience topics, including neuron function, the anatomical and functional organization of the nervous system, and diseases of the nervous system. With lab. Credit not awarded for both NSCI 2100 and NSCI 2105. Prerequisites: PSYS 1400; BIOL 1400, BIOL 1450; or BCOR 1400, BCOR 1450; or BIOL 1000, BIOL 1005; or BIOL 1000, BCOR 1425; or ANPS 1190, ANPS 1200. Pre/Co-requisites: CHEM 1400. Catamount Core: N2.

NSCI 2105. Exploring Neuroscience. 3 Credits.

In-depth survey of neuroscience topics, including neuron function, the anatomical and functional organization of the nervous system, and diseases of the nervous system. No laboratory. Credit not awarded for both NSCI 2100 and NSCI 2105. Prerequisites: PSYS 1400; BIOL 1400, BIOL 1450; or BCOR 1400, BCOR 1450; or BIOL 1000, BIOL 1005; or BIOL 1000, BCOR 1425; or ANPS 1190, ANPS 1200. Co-requisite: CHEM 1400. Catamount Core: N1.

NSCI 2990. Special Topics. 1-18 Credits.

See Schedule of Courses for specific titles.

NSCI 2995. Undergraduate Research. 1-18 Credits.

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

NSCI 3220. Cellular Neurophysiology. 3 Credits.

Fundamentals of cellular neurophysiology through lecture, independent student reading and faculty-led group discussions of journal articles. Credit not awarded for both NSCI 3220 and NSCI 5220. Prerequisites: NSCI 2100 or NSCI 2105 or Instructor permission.

NSCI 3230. Neurochemistry. 3 Credits.

Using current primary papers on these topics, studies the current state of neuroscience research and examine the basis of neural disorders including neurodegeneration, psychiatric abnormalities such as anxiety and related stress-associated disorders, and other neuropathologies. The papers will dissect methodologies, approaches and advances in these issues. Credit not awarded for both NSCI 3230 and NSCI 5300.

NSCI 3250. Human Neuroanatomy. 0 or 3 Credits.

Functional anatomy of the human nervous system on both the microscopic and macroscopic scales. Focuses on the structures of the peripheral nervous system, spinal cord, and brain, and how they work together to achieve behavior. Lectures and a required laboratory (gross and microscopic anatomy). Prerequisite: NSCI 2105.

NSCI 3500. Neuroregeneration. 3 Credits.

Clinical neuroscience of injury and healing in the human nervous system, factors leading to different outcomes, and the impact of successful and failed repair on functional recovery. Explores cutting-edge approaches to treating neurological disease. Prerequisite: NSCI 2100, NSCI 2105, or BIOL 3505.

NSCI 3610. Neurobiology for Majors. 3 Credits.

Exploration of the fundamental concepts in neurobiology. Topics include cell biology of the nervous system, electrical signaling/synaptic transmission, signal transduction, plasticity, and motor and sensory systems, and behavioral neuroscience. Credit not awarded for both BIOL 3505 and NSCI 3505. Prerequisites: BCOR 2300; NSCI 2105 or NSCI 2100.

NSCI 3990. Special Topics. 1-18 Credits.

See Schedule of Courses for specific titles.

NSCI 3991. Internship. 1-18 Credits.

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

NSCI 3993. Independent Study. 1-18 Credits.

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

NSCI 3995. Undergraduate Research. 1-18 Credits.

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

NSCI 4500. Diseases of the Nervous System. 3 Credits.

Senior level, seminar-style capstone course in which students bring together information learned in other courses for an in-depth study of disease states of the nervous system. Prerequisites: NSCI 2100 or NSCI 2105; Senior standing. Catamount Core: N1.

NSCI 4990. Special Topics. 1-18 Credits.

See Schedule of Courses for specific titles.

NSCI 4994. Teaching Assistantship. 1-3 Credits.

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

NSCI 4996. Honors. 1-6 Credits.

College honors thesis or other department/program honors, under the supervision of a faculty member. Offered at department discretion.