NEUROSCIENCE

Director: Siddharth Ramakrishnan, *Biology and Jennie M. Caruthers Chair in Neuroscience (on leave 2020-2021)*

Advisory Committee: Roger Allen, *Physical Therapy*; David Andresen, *Psychology*; Susannah Hannaford, *Biology*; and Gary McCall, *Exercise Science*

Neuroscience Faculty: David Andresen, *Psychology, Acting Director 2020-2021*; Adam Smith, *Mathematics and Computer Science*; Erin Colbert-White, *Psychology*; Jung Kim, *Exercise Science;* Jill Nealey-Moore, *Psychology*; Mark Reinitz, *Psychology*; Justin Tiehen, *Philosophy*; Shen-Yi Liao, *Philosophy*; Stacey Weiss, *Biology*; Susannah Hannaford, *Biology*; Melvin Rouse, *Psychology*; Roger Allen, *Physical Therapy*.

About the Program

The Neuroscience Program provides a forum for faculty and students interested in the sub-disciplines within the field of neuroscience. The program offers a general introductory course in neuroscience as an elective for all students, and also offers an interdisciplinary minor that may serve as an enhancement of, or complement to, any major of a student's choice. This interdisciplinary minor provides additional opportunities for students to develop skills necessary to become successful scientists and is recognized with a designation on the transcript upon graduation. Participation in the minor by both faculty and students facilitates involvement in broader neuroscience topics and contributes to a sense of community across departments. A key feature of this program is a research or internship experience in the field. Involving students in research not only broadens their knowledge and training in brain sciences, but also kindles an interest in and an appreciation for the methodological, philosophical, and ethical issues with which neuroscientists are concerned. This additional experience significantly improves the training of our students as they prepare for entry into careers in basic research, health care, secondary teaching, and public policy. Additionally, the Neuroscience Program is a part of a consortium of Northwest Liberal Arts Colleges offering Neuroscience experiences. pugetsound.edu/neuroscience

Requirements for the Minor in Neuroscience

1. Completion of five units to include:
   A. NRSC 201, Introduction to Neuroscience (prerequisite: BIOL 111 OR BIOL 101 with permission of instructor OR permission of instructor). Note: Completion of NRSC 201 with a grade of C or better is required to earn an emphasis in neuroscience minor.
   B. Completion of three units of elective courses, at least two from outside the student's major. No more than one elective course may be used to fulfill the student's major and neuroscience minor. Selection of elective courses should be made in consultation with a neuroscience advisor.

      Biological Foundations of Neuroscience
      BIOL 212 Cell Biology
      BIOL 340 Animal Communication
      BIOL 361 Biochemical Pathways and Processes OR CHEM 461, Metabolic Biochemistry
      BIOL 404 Molecular Biology
      BIOL 434 Neurobiology
      CHEM 461 Metabolic Biochemistry
      EXSC 221 Human Physiology
      EXSC 222 Human Anatomy
      EXSC 328 Neuromuscular Adaptation
      EXSC 424 Recent Advances in Cellular and Molecular Mechanisms of Neuroplasticity
      PHYS 231 Circuits and Electronics
      PSYC 313 Physiological Psychology
      NRSC 350 Methods in Neuroscience

      Cognitive and Behavioral Neuroscience
      BIOL 472 Animal Behavior
      CONN 354 Hormones, Sex, Society, & Self*
      CONN 357 Exploring Animal Minds
      CONN 393 Cognitive Foundations of Morality and Religion
      PHIL 105 Neuroethics and Human Enhancement
      PHIL 230 Philosophy of Mind
      PHIL 250 Moral Philosophy
      PHIL 340 Philosophy of Cognitive Science
      PSYC 230 Behavioral Neuroscience
      PSYC 356 Clinical Neuropsychology
      PSYC 310 Sensation, Perception, and Action
      PSYC 335 Cognitive Psychology
      PSYC 351 Language Development
      PSYC 373 Perceiving Self and Other
      PSYC 313 Physiological Psychology
      STS 318 Science and Gender
      STS 366 History of Medicine
   C. NRSC 450 Senior Seminar: Special Topics in Neuroscience

   * Can also satisfy the Connections core requirement.

   For complete descriptions of the elective courses, please consult the relevant departments in which these courses appear

2. Completion of either an internship or research experience in the discipline and approved in advance by the steering committee. (Note: students must meet with a neuroscience advisor and submit an application for internship/research prior to the end of the second semester of their junior year.) Course credit earned from an internship or research experience does not count toward the required five units of course work outlined above.

Notes

1. No more than one course can be taken to fulfill requirements of a student's first major will not count towards the Neuroscience minor requirements.
2. Courses may be taken to fulfill the Neuroscience minor requirements and Core, other minor, second major, and university graduation requirements.
3. Internship/research may be taken for credit through the Internship Program or the student's major department.

Course Offerings

Unless otherwise specified, each course carries 1 unit of credit and is offered at least once each academic year. Please see "Frequency of Course Offerings" on page 10.

Other courses taught by Neuroscience faculty. *See Connections in the Core Curriculum section of this Bulletin for course descriptions.*

CONN 303 Art-Science: Inquiry into the Intersection of Art, Science, and Technology
Satisfies the Connection core requirement.

201 Foundations of Neuroscience This course provides a survey of the structure and function of the nervous system, neurophysiology, and sensorimotor systems, including examples of neuropathologies (e.g., spinal cord injury, neuropathic pain, and Parkinson's disease). Students also explore selected topics in depth, such as motivation (e.g., eating and sexual behavior), memory processes, and clinical disorders (e.g., post-traumatic stress, schizophrenia, and dementia). This course is required of students pursuing a neuroscience minor, but is open to all students. *Prerequisite: BIOL 111 OR BIOL 101 with permission of instructor OR permission of instructor.*

350 Methods in Neuroscience This course offers students an introduction to various methods in the field of Neuroscience. Neuroscience is an interdisciplinary field that spans a range of topics from basic biology to psychology to therapeutics in the clinical setting. This course provides a flavor of a few of the techniques used currently in the field of neurosciences and explore methods from historical, futuristic and ethical perspectives. Hands-on training on a range of methodologies with scope for independent projects is provided. *Prerequisite: NRSC 201. Offered occasionally.*

450 Senior Seminar: Special Topics in Neuroscience This course provides a capstone experience for students earning a Neuroscience Emphasis and is designed for senior undergraduates who have completed all other course requirements in the emphasis. This course offers students in the program the opportunity to explore and discuss more sophisticated theories and complex methods in neuroscience than was possible at the introductory level. This seminar features student-led discussions of advanced topics in the discipline, including nervous system organization, neurochemistry, brain plasticity, neural bases of learning and memory, diseases and injury of the nervous system, and neuropharmacology. Also includes evening presentations by guest experts. *Prerequisite: senior neuroscience minor student, or permission of instructor.*

490 Advanced Topics in Neuroscience Neuroscience is a rapidly evolving field with new technologies and practices advancing yearly. In this course, experts in the field who are at the forefront of research in neuroscience teach in-depth current research and advanced technologies used for cutting-edge investigations and the future of neuroscience. Postdoctoral re-searchers from the University of Washington and the Fred Hutchinson Cancer Research Center team teach the course, offering insight into neuroscience within a highly advanced research context. *Prerequisite: NRSC 201.*