Northwestern University Interdepartmental Neuroscience Program (NUIN)

http://www.nuin.northwestern.edu/

Degree Types: PhD

Northwestern University Interdepartmental Neuroscience Program (http://www.nuin.northwestern.edu) (NUIN) is a highly interactive and collaborative program, with faculty distributed across more than 20 departments on the Lincoln Park, Chicago and Evanston campuses. Our program encourages interdisciplinary neuroscience research among seven NU-affiliated centers, including the Children’s Memorial Research Center (Lincoln Park), the Feinberg School of Medicine and Rehabilitation Institute of Chicago (Chicago), the Weinberg College of Arts and Sciences, the McCormick School of Engineering, the School of Communication and the Kellogg School of Management (Evanston). NUIN faculty pursue a broad range of research interests including molecular and developmental neuroscience, cellular physiology, cognition and systems neuroscience, and medical or ‘translational’ research. Training in research is supplemented with core and elective coursework, mentorship, teaching and other professional development opportunities.

This program attracts applicants from a broad array of academic backgrounds, including neuroscience, biology, computer science, chemistry, engineering, physics, and psychology. Our curriculum is designed to embrace this diversity while also providing intensive training in fundamental principles of neuroscience.

Degrees Offered

- Interdepartmental Neuroscience Program (NUIN) PhD (https://catalogs.northwestern.edu/tgs/nuin/interdepartmental-neuroscience-program-phd)

Northwestern University Interdepartmental Neuroscience Program (NUIN) Courses

NUIN 401-1 Fundamentals of Neuroscience (2 Units)
This course covers fundamentals concepts pertaining to the genetics, cell biology, and physiology of neurons. Major topics include gene expression and regulation, protein production and trafficking, neuronal ultrastructure, glial physiology, electrophysiology and membrane biophysics, synaptic communication and plasticity, receptor/neurotransmitter pharmacology, and signal transduction.

NUIN 401-2 Fundamentals of Neuroscience (1 Unit)

NUIN 408-0 Quantitative Methods and Experimental Design (1 Unit)

NUIN 411-1 Great Experiments in Molecular and Developmental Neuro Science (1 Unit)

NUIN 411-2 Great Experiments in Cellular Neurophysiology (1 Unit)

NUIN 411-3 Great Expts in System & Cognitive Neuroscience (1 Unit)

NUIN 417-0 Proteinopathies: Alzheimer’s Disease as a Case Study (1 Unit)

NUIN 418-0 Assembly of Neural Circuits (1 Unit)

NUIN 421-0 Circadian Rhythms (1 Unit)

NUIN 424-0 Sensory Transduction and Early Visual Processing (1 Unit)

NUIN 430-1 Introduction to Neuroscience Research (0 Unit)

NUIN 433-0 The Neurobiology of Disease (1 Unit)

NUIN 436-0 Drugs and the Brain (1 Unit)
Graduate neuropharmacology course with a mix of didactic instruction (33%) and in-depth classroom discussion of primary research papers (66%). The course is not a survey course, but rather will cover selected topics in neuropharmacology with the goals of 1) informing the student of the latest neuropharmacology knowledge, 2) inculcating a rigorous approach to examination of the scientific literature, and 3) encouraging best practices in experimental design.

NUIN 438-0 Cellular and Molecular Aspects of Motor Neuron Biology (1 Unit)
This course is designed to expose students to the current findings and developments in the field of motor neuron biology in the context of development, health, and disease. Both cortical and spinal components of motor neuron circuitry will be discussed in depth.

NUIN 440-0 Advanced Neuroanatomy (1 Unit)

NUIN 441-0 Biophysical Signal Processing for Movement & Rehabilitation Sciences (1 Unit)

NUIN 442-0 Issues in Movement & Rehabilitation Science (1 Unit)

NUIN 455-0 Instrumentation for Neuroscience (1 Unit)

NUIN 460-0 Interneurons and Brain Networks (1 Unit)

NUIN 462-0 Cortical Circuit Organization (1 Unit)

NUIN 470-0 Cellular & Molecular Basis of Information Storage (1 Unit)

NUIN 473-0 Cellular and Behavioral Mechanisms of Aging and Dementia (1 Unit)

NUIN 475-0 Nerve Excitation and Synaptic Transmission (1 Unit)

NUIN 478-0 Neuropharmacology of Brain Disorders (1 Unit)

NUIN 480-0 Neural Control of Movement (1 Unit)

NUIN 481-0 Neural Mechanism of Pain (1 Unit)

NUIN 486-0 The Biology of Sleep (1 Unit)

NUIN 490-0 Responsible Conduct in Neuroscience Research (0 Unit)

NUIN 493-0 MOLECULAR BASIS OF NATURAL HISTORY (0 Unit)
The molecular basis of natural history course will examine important examples from Nature and use the approaches of biochemistry, molecular biology and genetics to categorize and analyze the natural products produced by bacteria, plants and animals and examine how they have impacted human history. Most 2 hour sessions will be devoted to a particular topic. After an introduction by faculty, course participants will examine the subject further through the discussion of assigned papers from the literature or other texts. Some sessions will also be devoted solely to presentations of topics by the students. All students will submit and essay on a topic covered by the course or a related topic in natural history.

NUIN 495-0 Topics in Neuroscience (1 Unit)

NUIN 499-0 Independent Study (1 Unit)
SEE DEPT FOR SECTION AND PERMISSION NUMBERS.
NUIN 510-0 Advanced Topics in Visual Science (0 Unit)
NUIN 550-0 Postbaccalaureate Neuroscience Research (0 Unit)
Research conducted with a faculty mentor as part of the Interdepartmental Neuroscience (NUIN) Post-Baccalaureate program.

NUIN 590-0 Research (1-3 Units)
SEE DEPT FOR SECTION AND PERMISSION NUMBERS.