NEUROSCIENCE (NSCI)

NSCI 61. First-Year Seminar: Drug Addiction: Fact and Fiction. 3 Credits.
The course will tackle questions through classroom discussions, lectures, movies, writing assignments, and a visit to a research laboratory and a treatment facility. Students will be introduced to fundamental concepts in addiction research. Honors version available
Gen Ed: PL, CI.
Grading status: Letter grade.

NSCI 61H. First-Year Seminar: Drug Addiction: Fact and Fiction. 3 Credits.
The course will tackle questions through classroom discussions, lectures, movies, writing assignments, and a visit to a research laboratory and a treatment facility. Students will be introduced to fundamental concepts in addiction research.
Gen Ed: PL, CI.
Grading status: Letter grade.

NSCI 71. First Year Seminar: Plasticity and the Brain. 3 Credits.
This course will introduce students to the recent research and debate regarding neural plasticity and the ability of the healthy adult brain to change. Exciting new research suggests that the ability of the adult brain to change goes well beyond simply acquiring new knowledge and memories. Previously offered as PSYC 71.
Gen Ed: PL.
Grading status: Letter grade.

NSCI 89. First Year Seminar: Special Topics. 3 Credits.
Content varies by semester. Honors version available
Grading status: Letter grade.

NSCI 89H. First Year Seminar: Special Topics. 3 Credits.
Content varies by semester.
Grading status: Letter grade.

NSCI 175. Introduction to Neuroscience. 3 Credits.
Provides an introduction to the structure and function of the nervous system. Fundamental principles will be introduced including nervous system anatomy; molecular and cellular properties of the nervous system; sensory and motor systems; current methods used in neuroscience; and how the nervous system produces behavior and cognition. This course provides greater breadth and depth of neuroscience topics, as compared to Biopsychology (PSYC 220). Previously offered as PSYC 175 and 315.
Gen Ed: PL.
Grading status: Letter grade.

NSCI 190. Special Topics in Neuroscience. 3 Credits.
An undergraduate seminar course that is designed to be a participatory intellectual adventure on an advanced, emergent, and stimulating topic within a selected discipline of neuroscience. This course does not count as credit toward the neuroscience major or minor.
Grading status: Letter grade.

NSCI 222. Learning. 3 Credits.
Topics in Pavlovian and operant (instrumental) conditioning, learning theory, higher order cognitive learning, and application of those principles to mental-health related situations. Previously offered as PSYC 222.
Honors version available
Requisites: Prerequisite, NSCI 175 or PSYC 101.
Gen Ed: PL.
Grading status: Letter grade.

NSCI 222H. Learning. 3 Credits.
Topics in Pavlovian and operant (instrumental) conditioning, learning theory, higher order cognitive learning, and application of those principles to mental-health related situations. Previously offered as PSYC 222.
Requisites: Prerequisite, NSCI 175 or PSYC 101.
Gen Ed: PL.
Grading status: Letter grade.

NSCI 225. Sensation and Perception. 3 Credits.
Topics in vision, audition, and the lower senses. Receptor mechanisms, psychophysical methods, and selected perceptual phenomena will be discussed. Previously offered as PSYC 225.
Honors version available
Requisites: Prerequisite, NSCI 175 or PSYC 101.
Gen Ed: PL.
Grading status: Letter grade.

NSCI 225H. Sensation and Perception. 3 Credits.
Topics in vision, audition, and the lower senses. Receptor mechanisms, psychophysical methods, and selected perceptual phenomena will be discussed. Previously offered as PSYC 225.
Requisites: Prerequisite, NSCI 175 or PSYC 101.
Gen Ed: PL.
Grading status: Letter grade.

NSCI 276. Cellular Electrophysiology Laboratory. 3 Credits.
This 'hands-on' laboratory-based course is designed to teach students electrophysiology techniques used in the interdisciplinary field of neuroscience. Neuroscience majors only.
Requisites: Prerequisites, NSCI 175 and one of PSYC 210, 215, or STOR 155.
Grading status: Letter grade.

NSCI 278. Molecular Imaging of the Brain. 3 Credits.
Students will design novel experiments to examine and visualize sex differences in the nervous system. Students will learn how to handle brain slices, neuroanatomy, microscopy, immunohistochemistry and imaging analysis techniques by studying neuronal diversity in the norepinephrine system of mice. Students will have the opportunity to develop and test their own hypotheses, write a research proposal, and present their work in poster form. Majors only.
Requisites: Prerequisites, NSCI 175 and one of the following: PSYC 210 or STOR 155.
Gen Ed: EE- Mentored Research.
Grading status: Letter grade.

NSCI 290. Current Topics in Neuroscience. 3 Credits.
Various special areas of neuroscientific study, offered as needed. Honors version available
Requisites: Prerequisite, NSCI 175.
Repeat rules: May be repeated for credit. 6 total credits. 2 total completions.
Grading status: Letter grade.

NSCI 290H. Current Topics in Neuroscience. 3 Credits.
Various special areas of neuroscientific study, offered as needed.
Requisites: Prerequisite, NSCI 175.
Repeat rules: May be repeated for credit. 6 total credits. 2 total completions.
Grading status: Letter grade.
NEUROSCIENCE (NSCI)

NSCI 294. Service Learning in Neuroscience: APPLES. 1-3 Credits.
Permission of the instructor. Service learning component for students enrolled in Neuroscience APPLES courses. May not count toward the major or minor.
**Requisites:** Prerequisite, NSCI 175.
**Gen Ed:** EE- Service Learning.
**Grading status:** Letter grade.

NSCI 320. Neuropsychopharmacology. 3 Credits.
This course provides an introduction to the scientific study of psychopharmacology, with emphasis on drugs of abuse and psychotherapeutic drugs. Previously offered as PSYC 320.
**Requisites:** Prerequisite, NSCI 175, or both PSYC 101 and PSYC 220.
**Gen Ed:** PL.
**Grading status:** Letter grade.

NSCI 325. Neuroscience of Psychiatric Disorders. 3 Credits.
This course will examine the molecular, cellular, and neurocircuity substrates of psychiatric disorders. Topics covered will include neurobiological theories of the major classes of psychiatric disorders, genetic susceptibility, neurotransmitter systems involved, neuroplasticity, and others.
**Requisites:** Prerequisite, NSCI 175 or both PSYC 101 and PSYC 220.
**Gen Ed:** PL.
**Grading status:** Letter grade.

NSCI 390. Current Topics In Neuroscience. 3 Credits.
Various special areas of neuroscience study, offered as needed.
**Requisites:** Prerequisite, NSCI 175.
**Repeat rules:** May be repeated for credit. 6 total credits. 2 total completions.
**Grading status:** Letter grade.

NSCI 395. Independent Research. 3 Credits.
Supervised research resulting in a written report. May be repeated for credit up to eight hours. Up to three hours may count as a neuroscience methods elective. Permission of the instructor.
**Requisites:** Prerequisites, NSCI 175 and two additional NSCI courses, at least one of which must be numbered 200 or greater; a minimum of a 3.0 cumulative grade point average.
**Gen Ed:** EE- Mentored Research.
**Repeat rules:** May be repeated for credit. 8 total credits. 1 total completions.
**Grading status:** Letter grade.

NSCI 401. Animal Behavior. 3 Credits.
Ethological, genetic, and physiological variables will be studied in relation to their behavioral effects. Previously offered as PSYC 401.
**Requisites:** Prerequisites, BIOL 101 and NSCI 175, or combination of BIOL 101, PSYC 101 and NSCI 222; PSYC 270 recommended.
**Gen Ed:** PL.
**Grading status:** Letter grade
**Same as:** NBI0 401.

NSCI 403. Advanced Biopsychology Laboratory. 3 Credits.
'Hands on' laboratory course designed to introduce students to experimental protocols emphasizing 'brain-behavior' relationships. Topics include gross neuroanatomy, stereotaxic surgery, and the effects of drugs on behavior. Previously offered as PSYC 403. Honors version available
**Requisites:** Prerequisite, NSCI 175 or PSYC 101 and 220.
**Gen Ed:** PX, EE- Mentored Research.
**Grading status:** Letter grade.

NSCI 403H. Advanced Biopsychology Laboratory. 3 Credits.
'Hands on' laboratory course designed to introduce students to experimental protocols emphasizing 'brain-behavior' relationships. Topics include gross neuroanatomy, stereotaxic surgery, and the effects of drugs on behavior. Previously offered as PSYC 403.
**Requisites:** Prerequisite, NSCI 175 or PSYC 101 and 220.
**Gen Ed:** PX, EE- Mentored Research.
**Grading status:** Letter grade.

NSCI 405. Advanced Molecular Neuropharmacology. 3 Credits.
This course will examine the molecular basis of drug action in the brain. Primary literature will be used to investigate pharmacological principles, receptor structure-function relationships, and receptor-ligand interactions, including ligand gated-ion channel and G-protein coupled receptor signaling.
**Requisites:** Prerequisites, NSCI 175 or both PSYC 101 and PSYC 220, and NSCI 320/PSYC 320.
**Gen Ed:** PL.
**Grading status:** Letter grade.

NSCI 415. History of Neuroscience. 3 Credits.
In this class, we will consider how neuroscience emerged as a multidisciplinary field. The class will cover key research findings that propelled the field forward. We will also delve into the autobiographies of some of the pioneering researchers who made these important discoveries. Previously offered as PSYC 415.
**Requisites:** Prerequisite, NSCI 175, or both PSYC 101 and 220.
**Gen Ed:** SS.
**Grading status:** Letter grade.

NSCI 420. Functional Neuroanatomy. 3 Credits.
For advanced undergraduate and graduate students. An introduction to human neuroanatomy, covering function of the neuroanatomy of each major system and relation to neurobehavioral disorders associated with damage to the neuroanatomy of the system. Previously offered as PSYC 420.
**Requisites:** Prerequisites, NSCI 175, or PSYC 101 and 220; recommended preparation, EXSS 175.
**Gen Ed:** PL.
**Grading status:** Letter grade.

NSCI 421. Principles of Brain Circuits. 3 Credits.
This course is designed for upper-level undergraduates who are interested in how brain circuits control behavior. A major focus will be the new technique of optogenetics that is revolutionizing our approach to systems neuroscience. Circuits that control movement, sensation, sleep, memory, and fear will be explored in detail. Points of emphasis will be circuits mediating pain as related to actions of opiates and circuits mediating feeding behavior as related to obesity.
**Requisites:** Prerequisites, NSCI 175, or both PSYC 101 and PSYC 220; BIOL 101 recommended.
**Gen Ed:** PL.
**Grading status:** Letter grade.

NSCI 422. Genetics of Brain Diseases. 3 Credits.
This course will explore the manifestations and causes of important neurological and psychiatric diseases. A particular focus will be the impact of advances in genetics on our understanding of these disorders. Disorders that affect large numbers of patients including Alzheimer’s disease, autism, and schizophrenia will be studied in detail.
**Requisites:** Prerequisite, NSCI 175, or both PSYC 101 and PSYC 220.
**Gen Ed:** PL.
**Grading status:** Letter grade.
**NSCI 423. Neurotechnology in Modern Neuroscience Research. 3 Credits.**
This course addresses fundamental challenges inherent in studying the brain and explores the theory, applications, and limitations of new and traditional neurotechnology. The unique ethical issues and significance of interdisciplinary approaches in neuroscience will also be highlighted. Students will analyze research literature and focus on cellular, molecular, and genetic techniques that are essential staples in the neuroscientist’s toolkit. Students will also design experiments, utilize publicly available resources, and analyze big data generated by high-throughput approaches.

*Gen Ed:* PL

*Grading status:* Letter grade.

**NSCI 424. Neural Connections: Hands on Neuroscience. 3 Credits.**
This class will explore links between the brain and behavior through neuroscience outreach activities. Students will also reflect on the meaning of community engagement. By the end of the semester, each student must complete a minimum of 30 hours of service within the community. Previously offered as PSYC 424.

*Prerequisites:* Prerequisite, NSCI 175, or both PSYC 101 and 220.

*Gen Ed:* PL, EE - Service Learning.

*Grading status:* Letter grade.

**NSCI 427. Neurobiology of Aging. 3 Credits.**
This course will survey clinical and experimental literature regarding the neurobiology of aging, considering different theories of aging, how aging is studied in the laboratory, and recent findings. Biochemical, molecular, physiological, and behavioral changes associated with both ‘normal’ and pathological aging will be considered. Previously offered as PSYC 427.

*Prerequisites:* Prerequisites, NSCI 175, or both PSYC 101 and 220.

*Gen Ed:* PL

*Grading status:* Letter grade.

**NSCI 428. Neuroscience, Society, and the Media. 3 Credits.**
Neuroscience is a ‘hot’ topic in popular media. We will consider media coverage of neuroscientific research by reading the popular press versions of studies alongside the findings from primary sources and what kinds of topics are most often covered by the media and why. Previously offered as PSYC 428.

*Prerequisites:* Prerequisite, NSCI 175, or both PSYC 101 and 220.

*Gen Ed:* PL

*Grading status:* Letter grade.

**NSCI 434. Cognitive Neuroscience. 3 Credits.**
Introduction to cognitive neuroscience. Higher mental processes including attention, memory, language, and consciousness will be covered, with an emphasis on the neural mechanisms that form the substrates of human cognition. Previously offered as PSYC 434.

*Prerequisites:* Prerequisites, NSCI 175 and PSYC 230, or a combination of PSYC 101, 220 and 230.

*Gen Ed:* PL

*Grading status:* Letter grade.

**NSCI 437. Neurobiology of Learning and Memory. 3 Credits.**
This course surveys current knowledge about and research into the neurobiological basis of learning and memory. Using a combination of lectures and student-led discussions, we will critically evaluate the molecular, cellular, systems, and behavioral research that strives to explain how the brain learns and remembers. Previously offered as PSYC 437.

*Prerequisites:* Prerequisites, NSCI 175, or both PSYC 101 and 220; BIOL 101 recommended.

*Gen Ed:* PL

*Grading status:* Letter grade.

**NSCI 490. Current Topics in Neuroscience. 3 Credits.**
Various special areas of neuroscience study, offered as needed. Honors version available

*Prerequisites:* Prerequisite, NSCI 175.

*Repeat rules:* May be repeated for credit. 6 total credits. 2 total completions.

*Grading status:* Letter grade.

**NSCI 490H. Current Topics in Neuroscience. 3 Credits.**
Various special areas of neuroscience study, offered as needed.

*Prerequisites:* Prerequisite, NSCI 175.

*Repeat rules:* May be repeated for credit. 6 total credits. 2 total completions.

*Grading status:* Letter grade.

**NSCI 493. Internship in Neuroscience. 3 Credits.**
Required preparation, minimum of two other neuroscience courses and junior/senior standing. Designed for highly motivated neuroscience majors interested in exploring professional opportunities in neuroscience-related areas. Juniors and seniors only.

*Prerequisites:* Prerequisites, NSCI 175 and two additional NSCI courses.

*Gen Ed:* EE - Academic Internship.

*Grading status:* Letter grade.

**NSCI 507. Autism. 3 Credits.**
Intensive service-learning seminar on autism includes a supervised community placement. Topics include historical diagnostic issues, etiological theories, assessing patterns of functioning, developmental/life span issues, family concerns, and intervention approaches. Previously offered as PSYC 507.

*Prerequisites:* Prerequisites, NSCI 175 or PSYC 101, and both PSYC 245 and 250.

*Gen Ed:* PL

*Grading status:* Letter grade.

**NSCI 568. Emotion. 3 Credits.**
This course will provide a comprehensive overview of the scientific study of emotion. Topics will include theoretical models of emotion process and structure. A range of perspectives, including social, cultural, developmental, clinical, and cognitive psychology, as well as behavioral neuroscience, will be considered. Previously offered as PSYC 568.

*Prerequisites:* Prerequisite, NSCI 175 or PSYC 101.

*Gen Ed:* SS

*Grading status:* Letter grade.

**NSCI 571. Social Neuroscience. 3 Credits.**
Recommended preparation, PSYC 220 or 315. Social neuroscience is the study of how social processes and experiences are represented in and influence the structure and function of the brain. This course will focus primarily on functional magnetic resonance imaging (fMRI) studies of humans, though we will also discuss other brain imaging techniques and patient studies. Previously offered as PSYC 571.

*Prerequisites:* Prerequisites, NSCI 175 and PSYC 260, or combination of PSYC 101, 220, and 260.

*Gen Ed:* PL

*Grading status:* Letter grade.
NSCI 573. Neuropsychobiology of Stress. 3 Credits.
Stress is a common experience in modern life that impacts psychological and physical health. In this course, we will delve into the scientific literature in psychology and neuroscience that explores how the brain and the body respond to stress, and how we can intervene to prevent stress from negatively impacting physical and mental health.
**Requisites:** Prerequisites, PSYC 210 and 270, and NSCI 175 or both PSYC 101 and PSYC 220.
**Gen Ed:** PL
**Grading status:** Letter grade.

NSCI 693H. Honors in Neuroscience I. 3 Credits.
To be taken in the fall of the last year of studies as the first course in the two-semester honors sequence. Students conduct research under the direction of a faculty advisor and receive classroom instruction in research-related topics. Required preparation, cumulative GPA of 3.3, one semester of NSCI 395 (or equivalent faculty-lead research experience), and acceptance through application to the honors committee.
**Gen Ed:** CI, EE- Mentored Research.
**Grading status:** Letter grade.

NSCI 694H. Honors in Neuroscience II. 3 Credits.
To be taken as the second course in the two-semester honors sequence. Students conduct research under the direction of a faculty advisor and receive classroom instruction in research-related topics. Admission to the neuroscience honors program required.
**Requisites:** Prerequisite, NSCI 693H.
**Gen Ed:** CI, EE- Mentored Research.
**Grading status:** Letter grade.