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.

Rules & Requirements

IDEAs in Action Gen Ed: FY-SEMINAR.
Making Connections 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.

Rules & Requirements

IDEAs in Action Gen Ed: FY-SEMINAR.
Making Connections Gen Ed: PL.
Grading Status: Letter grade.

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

Rules & Requirements

IDEAs in Action Gen Ed: FY-SEMINAR.
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.

Rules & Requirements

IDEAs in Action Gen Ed: FC-NATSCI.
Making Connections 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.

Rules & Requirements
Grading Status: Letter grade.

NSCI 221. 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 NSCI/PSYC 320.

Rules & Requirements
Making Connections Gen Ed: PL.
Requisites: Prerequisites, NSCI 175, or both PSYC 101 and PSYC 220.
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.

Rules & Requirements
Making Connections Gen Ed: PL.
Requisites: Prerequisite, NSCI 175 or PSYC 101.
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.

Rules & Requirements
Making Connections Gen Ed: PL.
Requisites: Prerequisite, NSCI 175 or PSYC 101.
Grading Status: Letter grade.

NSCI 274. Neurophysiology Data Science Lab. 3 Credits.
In this research-based course, students will design novel experiments to examine sex differences in large neurophysiology datasets. Students will use Python to access and analyze data. Students will also learn research literature analysis, experimental design, data analysis, collaboration, and presentation skills by developing a research proposal, paper, and poster. Students may only receive credit for one of: NSCI 274, 276, 277, 278 and 279. Restricted to Neuroscience Majors only.

Rules & Requirements

IDEAs in Action Gen Ed: RESEARCH.
Making Connections Gen Ed: EE- Mentored Research.
Requisites: Prerequisites, NSCI 175 and either COMP 110 or COMP 116.
Grading Status: Letter grade.

NSCI 276. Neural Circuits of Hunger Lab. 3 Credits.
Students will design novel experiments to determine sex differences in nervous system control of food-seeking. Students will learn animal care, behavior, and electrophysiology by studying taste receptor sensitivity in fruit flies in response to interventions the students hypothesize will alter food-seeking. Students will also learn research literature analysis, experimental design, data analysis, and presentation skills through their proposal, paper, and presentation. Students may only receive credit for one: NSCI 274, 276, 277, 278 and 279. Restricted to Neuroscience Majors only.

Rules & Requirements

IDEAs in Action Gen Ed: RESEARCH.
Making Connections Gen Ed: EE- Mentored Research.
Requisites: Prerequisites, NSCI 175 and one of PSYC 210, 215, or STOR 155.
Grading Status: Letter grade.

NSCI 277. Addiction Neuroscience qPCR Laboratory. 3 Credits.
Addiction Neuroscience qPCR Laboratory is a laboratory and research-based course that will expose students to the fundamental and emerging approaches used in RT-qPCR addiction neuroscience research. In this course students will learn to handle rodent brains, perform cryostat sectioning, conduct reverse transcription, create a cDNA library, and utilize R programming to analyze qPCR results by studying genes of interest in the context of a drug exposed rodent. Majors only.

Rules & Requirements

IDEAs in Action Gen Ed: RESEARCH.
Making Connections Gen Ed: PX, EE- Mentored Research.
Requisites: Prerequisites, NSCI 175 and one of the following: PSYC 210 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 hypotheses, write a research proposal, and present their work in poster form. Students may only receive credit for one: NSCI 274, 276, 277, 278 and 279. Majors only.

Rules & Requirements

IDEAs in Action Gen Ed: RESEARCH.
Making Connections Gen Ed: PX, EE- Mentored Research.
Requisites: Prerequisites, NSCI 175 and one of the following: PSYC 210 or STOR 155.
Grading Status: Letter grade.

NSCI 279. Microglia Laboratory. 3 Credits.
In this laboratory course, students will utilize molecular biology techniques (e.g., immunohistochemistry and immunoassays) while developing and testing hypotheses regarding how environmental or experimental conditions alter microglia. Students will work in teams to design an experiment, and then collect, analyze, and report data. Students may only receive credit for one of: NSCI 274, 276, 277, 278 and 279. Neuroscience majors only.

Rules & Requirements

IDEAs in Action Gen Ed: RESEARCH.
Making Connections Gen Ed: PX, EE- Mentored Research.
Requisites: Prerequisites, NSCI 175 and one of the following: PSYC 210 or STOR 155.
Grading Status: Letter grade.

NSCI 290. Current Topics in Neuroscience. 3 Credits.
Various special areas of neuroscientific study, offered as needed. Honors version available.

Rules & Requirements
Requisites: Prerequisite, NSCI 175.
Repeat Rules: May be repeated for credit. 6 total credits. 2 total completions.
Grading Status: Letter grade.

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.

Rules & Requirements

IDEAs in Action Gen Ed: HI-SERVICE.
Making Connections Gen Ed: EE- Service Learning.
Requisites: Prerequisite, NSCI 175.
Grading Status: Letter grade.

NSCI 325. Neuroscience of Psychiatric Disorders. 3 Credits.
This course will examine the molecular, cellular, and neurocircuitry 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.

Rules & Requirements
Making Connections Gen Ed: PL.
Requisites: Prerequisite, NSCI 175 or both PSYC 101 and PSYC 220.
Grading Status: Letter grade.

NSCI 326. Neuroscience Career Development, Networking & Applications in the Working World. 3 Credits.
This course provides students interested in the neuroscience field an opportunity to gain valuable networking, job application and interviewing skills. Over the course of the semester students will meet with neuroscience professionals and create application packages. Students will learn from individuals in neuroscience related jobs about the diverse careers options available and strategies for navigating the job market successfully. Students will explore advances in neuroscience research and how they relate to industry, research, etc. Majors only.

Rules & Requirements
Requisites: Prerequisite, NSCI 175.
Grading Status: Letter grade.

NSCI 390. Current Topics In Neuroscience. 3 Credits.
Various special areas of neuroscience study, offered as needed.

Rules & Requirements
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. 1-3 Credits.
Supervised research resulting in a written report for declared NSCI majors. May be repeated for credit up to six hours. Up to three hours may count as a neuroscience methods elective. Permission of the instructor.

Rules & Requirements

IDEAs in Action Gen Ed: RESEARCH.
Making Connections Gen Ed: EE- Mentored Research.
Requisites: Prerequisites, NSCI 175 and two additional STEM courses one of which must be at the 200 level or above; a minimum of a 3.0 cumulative grade point average.
Repeat Rules: May be repeated for credit. 6 total credits. 6 total completions.
Grading Status: Letter grade.

NSCI 405. Advanced Molecular Neuropharmacology. 3 Credits.
This course will examine the molecular basis of drug action in the brain. Students will learn about ligand-receptor interactions and modulation of receptor number, structure, and function by drugs. Detailed examples will examine the molecular details of both ligand-gated ion channels and G-protein coupled receptors. The course will use analysis of primary literature and a semester-long makerspace project to delve into research where central themes will include developing critical thinking, design thinking, and communication skills.

Rules & Requirements

IDEAs in Action Gen Ed: FC-CREATE, RESEARCH.
Making Connections Gen Ed: PL.
Requisites: Prerequisites, NSCI 175 or both PSYC 101 and PSYC 220; and NSCI 221.
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.

Rules & Requirements
Making Connections Gen Ed: SS.
Requisites: Prerequisite, NSCI 175, or both PSYC 101 and 220.
Grading Status: Letter grade.

NSCI 418. Glial Neuroscience. 3 Credits.
The purpose of this course is to provide an in-depth investigation into glia cells in the brain, and their roles in health and disease. We will focus particularly on astrocytes, microglia, and oligodendrocytes, but we will also cover and discuss other glial cell types as well. A general overview will be provided for each topic, followed by study and discussion of primary literature.

Rules & Requirements
Requisites: Prerequisites, NSCI 175, or both PSYC 101 and 220.
Grading Status: Letter grade.

NSCI 419. Behavioral Endocrinology. 3 Credits.
The endocrine and nervous systems interact with each other in complex ways to influence behavioral processes. In this course, we will discuss the ways by which hormones regulate homeostatic and social behaviors, learning, stress responses, and affective disorders, among others. Additionally, we will read scientific articles to learn about advances in the field of neuroendocrinology.

Rules & Requirements

IDEAs in Action Gen Ed: FC-NATSCI or FC-QUANT.
Requisites: Prerequisite, NSCI 175 or PSYC 220.
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.

Rules & Requirements
Making Connections Gen Ed: PL.
Requisites: Prerequisites, NSCI 175, or PSYC 101 and 220; recommended preparation, EXSS 175.
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.

Rules & Requirements
Making Connections Gen Ed: PL.
Requisites: Prerequisites, NSCI 175, or both PSYC 101 and PSYC 220; BIOL 101 recommended.
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.

Rules & Requirements
Making Connections Gen Ed: PL.
Requisites: Prerequisite, NSCI 175, or both PSYC 101 and PSYC 220.
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.

Rules & Requirements
Making Connections Gen Ed: PL.
Requisites: Prerequisite, NSCI 175, or both PSYC 101 and PSYC 220.
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.

Rules & Requirements

IDEAs in Action Gen Ed: HI-SERVICE.
Making Connections Gen Ed: PL, EE- Service Learning.
Requisites: Prerequisite, NSCI 175, or both PSYC 101 and 220.
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.

Rules & Requirements
Making Connections Gen Ed: PL.
Requisites: Prerequisites, NSCI 175, or both PSYC 101 and 220.
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.

Rules & Requirements
Making Connections Gen Ed: PL.
Requisites: Prerequisite, NSCI 175, or both PSYC 101 and 220.
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.

Rules & Requirements
Making Connections Gen Ed: PL.
Requisites: Prerequisite, One of the following: NSCI 175, NSCI 222, NSCI 225, PSYC 220, or PSYC 230.
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.

Rules & Requirements
Making Connections Gen Ed: PL.
Requisites: Prerequisites, NSCI 175, or both PSYC 101 and 220; BIOL 101 recommended.
Grading Status: Letter grade.

NSCI 439. Neuroimmunology. 3 Credits.
The nervous and immune systems interact with each other in complex ways to influence behavior, health and well-being. In this course, we will examine the mechanisms by which these two systems interact. Further, we will cover how the nervous and immune systems function together to serve homeostasis, behavior and disease.

Rules & Requirements
Requisites: Prerequisite, NSCI 175 or PSYC 220.
Grading Status: Letter grade.

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

Rules & Requirements
Requisites: 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.

Rules & Requirements

IDEAs in Action Gen Ed: HI-INTERN.
Making Connections Gen Ed: EE- Academic Internship.
Requisites: Prerequisites, NSCI 175 and two additional NSCI courses.
Grading Status: Letter grade.

NSCI 507. Autism. 3 Credits.
Autism Spectrum Disorder (ASD) is characterized by difficulty in communication and social interaction. This course will examine scientific advancements in diagnosis, causes, and interventions for ASD. Additional topics include neurodiversity and inclusion.

Rules & Requirements
Making Connections Gen Ed: PL.
Requisites: Prerequisite, NSCI 175 or PSYC 101.
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.

Rules & Requirements

IDEAs in Action Gen Ed: FC-NATSCI.
Making Connections Gen Ed: SS.
Requisites: Prerequisite, NSCI 175 or PSYC 101.
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.

Rules & Requirements
Making Connections Gen Ed: PL.
Requisites: Prerequisites, PSYC 210 and 270, and NSCI 175 or both PSYC 101 and PSYC 220.
Grading Status: Letter grade.

NSCI 693H. Honors in Neuroscience I. 3 Credits.
This course comprises the first semester in the two-semester sequence of Senior Honors in Psychology/Neuroscience. There are two components to the course: research that you will conduct under the direction of your faculty thesis advisor, and this class, which you will attend with the other senior honors students to learn about research-related topics and receive consultations with the instructor and your classmates.

Rules & Requirements
IDEAs in Action Gen Ed: RESEARCH.
Making Connections Gen Ed: CI, EE- Mentored Research.
Requisites: Prerequisites, A cumulative GPA of 3.3, at least one semester of PSYC/NSCI 395 or the approved equivalent, and acceptance into the Psychology or Neuroscience Senior Honors Program; PSYC/NSCI 693H must be taken in the first semester of the last year of studies.
Grading Status: Letter grade.

NSCI 694H. Honors in Neuroscience II. 3 Credits.
This course comprises the second semester in the two-semester sequence of Senior Honors in Psychology/Neuroscience. There are two components to the course: research that you will conduct under the direction of your faculty thesis advisor, and this class, which you will attend with the other senior honors students to learn about research-related topics and receive consultations with the instructor and your classmates. Admission to the neuroscience honors program required.

Rules & Requirements
IDEAs in Action Gen Ed: RESEARCH.
Making Connections Gen Ed: CI, EE- Mentored Research.
Requisites: Prerequisites, A cumulative GPA of 3.3, completion of PSYC/NSCI 693H, at least one semester of PSYC/NSCI 395 or the approved equivalent, and acceptance into the Psychology or Neuroscience Senior Honors Program; PSYC/NSCI 694H must be taken in the second semester of the last year of studies.
Grading Status: Letter grade.