Neuroscience (NEUR)

NEUR 101 Introduction to Neuroscience (4)
This course provides an introduction to the structure and function of the central and peripheral nervous systems. Fundamental concepts and topics in neuroscience will be discussed using molecular/cellular, behavioral and/or cognitive frameworks; clinically relevant conditions (e.g., neurodegenerative diseases, psychiatric disorders) will also be explored. Methods and techniques used by neuroscientists in research laboratories and clinical settings will be used to understand how neuroscience knowledge is constructed.

NEUR 195 Introduction to Research (2 or 4)
An introduction to research methods and hypothesis-driven laboratory research in the context of a faculty member's research program. Activities may include literature reviews, training in laboratory techniques, and/or analyzing data. This course may be repeated for credit at the discretion of the instructor. *Prerequisite: Instructor prerequisite override required.*

NEUR 208 Neurobiology (4)
A comprehensive study of the biology of the nervous system covering its overall organization and development, electrical and chemical signaling, synaptic plasticity, and mechanisms of sensory perception and motor function. Non-laboratory course. *Prerequisite: (CHEM 119 or CHEM 120 or CHEM 121 or CHEM 122 or CHEM 150 or CHEM 151) and (NEUR 101 or BIOL 133).*

NEUR 220 Behavioral and Cognitive Neuroscience (4)
This course explores the neural mechanisms underlying behavior and cognition. Topics may include motivation, learning and memory, emotion, stress, sleep and circadian rhythms, attention, and decision-making. Neuroscience methodology and preclinical models of psychiatric and neurodegenerative disorders will be discussed. *Prerequisite: NEUR 101.*

NEUR 225 Cognitive Neuroscience (4)
This course provides a systems-level approach to the study of the mammalian nervous system. Content focuses on various aspects of cognitive processing, such as perception, attention, memory, learning, emotion, executive control and decision making. *Prerequisite: NEUR 101.*

NEUR 254 Behavioral Neuroscience (4)
This course introduces major topics and techniques used by behavioral neuroscientists to study the relationship between the brain and behavior. Content may explore motivated behaviors, stress, learning and memory, control of movement, sleep and circadian rhythms, and preclinical models of psychiatric and neurodegenerative disorders. *Prerequisite: NEUR 101.*

NEUR 295 Mentored Research (2 or 4)
Intermediate-level laboratory research in the context of a faculty member's research program. Activities may include designing and/or conducting experiments, analyzing data, and written/oral presentation of findings. This course may be repeated for credit at the discretion of the instructor. *Prerequisite: NEUR 195 and instructor prerequisite override required.*

NEUR 351 Experimental Neurobiology (Lab) (4)
This lecture and laboratory course utilizes electrical recordings from a variety of invertebrates to build upon topics discussed in NEUR 208, illustrating the principles of nervous system communication in sensory and motor systems. The course will also include the roles of hypothesis testing, models, data analysis, and the scientific method in understanding how experimental data can lead to knowledge of nervous system function. *Prerequisite: NEUR 208.*

NEUR 355 Advanced Cognitive Neuroscience (Lab) (4)
This laboratory course provides an experimental approach to the study of cognitive processing, building on topics introduced in NEUR 225. Laboratory exercises may cover processes such as perception, attention, memory, learning and decision making. The course includes a focus on scientific methodology, including hypothesis testing, study design, data collection and analysis, and communication of results. *Prerequisite: NEUR 225.*

NEUR 359 Advanced Behavioral Neuroscience (Lab) (4)
This inquiry-based laboratory course explores the relationship between the brain and behavior. Class research projects will focus on select topics in behavioral neuroscience. Students will engage with the scientific process by designing and conducting experiments to test hypotheses, collecting and analyzing data, and communicating results. *Prerequisite: PSYC 254.*

NEUR 395 Advanced Research (2 or 4)
Advanced laboratory research for students who have a strong background in neuroscience research. Students will work with a faculty research mentor to design and conduct experiments aimed to address a novel scientific question. This course may be repeated for credit at the discretion of the instructor. *Prerequisite: NEUR 295 and instructor prerequisite override required.*

NEUR 415 Ion Channels and Disease (4)
This upper level course examines the structure and function of ion channels at the molecular level, including the biophysics of ion permeability, voltage-sensing, and activation by neurotransmitters. Approximately half of the course is student-led discussions on research papers that detail ion channel dysfunction that lead to disease. *Prerequisite: (NEUR 208 or NEUR 225 or NEUR 254) and (BIOL 243 or BIOL 233 or PSYC 251).*

NEUR 416 Neuroscience of Preference and Choice (4)
This seminar course examines topics related to the neuroeconomics of choice. Topics may include cognitive effort, temporal discounting, overconfidence, risk sensitivity, anchoring, and prospect theory. A significant portion of the course consists of student-led discussion of readings examining these topics. Readings focus on scholarly works featuring psychological and neurobiological perspectives. *Prerequisite: NEUR 225 or PSYC 208.*

NEUR 444 Independent Study (2 or 4)
Students will complete directed readings and writing on a topic in neuroscience. Must be approved by the program chair. This course may be repeated for credit when the topic differs. *Prerequisite: Instructor prerequisite override required.*

NEUR 495 Topics in Neuroscience (2 or 4)
Selected topics in neuroscience. Content will vary from semester to semester. This course may be repeated for credit when the topic differs. This course is only available through the Sewanee-at-Yale Directed Research Program. *Prerequisite: Only open to students admitted to the Sewanee-at-Yale program.*

NEUR 499 Directed Research (4 or 8)
Students conduct research under the direction of a faculty member on a topic of mutual interest. Typically culminates in a written research report. This course is only available through the Yale Directed Research Program. *Prerequisite: Only open to students admitted to the Sewanee-at-Yale program.*