

# Neuroscience (NEUR)

---

## NEUR 101 Introduction to Neuroscience (4)

This course provides an introduction to the mammalian nervous system. Content focuses on the structure and function of the brain, and explores methods used by neuroscientists. Sensory systems, control of movement, learning and memory, and diseases of the brain may be discussed.

## NEUR 208 Neurobiology (4)

A comprehensive study of the vertebrate nervous system covering its overall organization and development, function, control of homeostatic systems, and mechanisms of sensory perception. Non-laboratory course. *Prerequisite: (CHEM 120 or CHEM 150) and (NEUR 101 or BIOL 133).*

## NEUR 225 Cognitive Neuroscience (4)

An introductory course on the neural bases of higher cognitive processes including perception, action, attention, memory, language, socio-emotional functions, executive functions and consciousness. Also discussed are the mind-body problem and other current theories and conceptual approaches. *Prerequisite: NEUR 101.*

## NEUR 254 Behavioral Neuroscience (4)

An introduction to the field of behavioral neuroscience. The course begins with an overview of the basics of brain anatomy, brain organization, and neuronal signaling. The remainder of the course focuses on specific topics that are commonly studied by neuroscientists. Such topics include the brain basis of memory, emotion, aging, and sleep. *Prerequisite: NEUR 101.*

## NEUR 351 Experimental Neurobiology (Lab) (4)

This lecture and laboratory course utilizes electrical recordings from a variety of invertebrates and vertebrates 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 Affective Neuroscience (Lab) (4)

This course covers the systems-level neural and behavioral bases of human and animal emotion. Students discuss readings paramount to understanding how we perceive motivationally significant information and stimuli and experience, express, and regulate our emotions. The course explores basic theories of emotion, automatic processes, emotion regulation, rewards, social relationships, decision-making, learning and memory, stress, and psychopathology (e.g., depression, anxiety, and personality disorders). Students design and conduct experiments using cognitive neuroscience methodology related to affective processing or emotion regulation, analyze the data, and write detailed laboratory reports. *Prerequisite: PSYC 251 and (NEUR 225 or NEUR 254 or NEUR 208 or PSYC 225 or PSYC 254).*

## NEUR 359 Advanced Behavioral Neuroscience (Lab) (4)

An examination of how brain function affects behavior. The course is an extension of NEUR 254 and includes an advanced examination of brain organization, neuronal signaling, and specific topics that are studied by neuroscientists. Such topics include the brain bases of fear, pain, eating, sexuality, and stress. This class also examines methods used to study behavioral neuroscience in humans and animals. The course includes a laboratory with a brain dissection and focus on designing and conducting studies to answer empirical questions about behavioral neuroscience. *Prerequisite: PSYC 251 and (NEUR 254 or PSYC 254 or PSYC 225 or NEUR 208 or NEUR 225).*

## NEUR 360 Affective Neuroscience (4)

This course covers the systems-level neural and behavioral bases of human and animal emotion. Students discuss readings paramount to understanding how we perceive motivationally significant information and stimuli and experience, express, and regulate our emotions. The course explores basic theories of emotion, automatic processes, emotion regulation, rewards, social relationships, decision-making, learning and memory, stress, and psychopathology (e.g., depression, anxiety, and personality disorders). This course cannot be taken for credit if the student has already received credit for NEUR 355. *Prerequisite: PSYC 251 and (NEUR 225 or NEUR 254 or PSYC 225 or PSYC 254 or NEUR 208).*

## NEUR 414 The Social Brain (4)

A seminar focusing on the interdisciplinary field of social neuroscience. Course content examines social and emotional behavior through a variety of levels and contexts, and identifies the neural systems that support these behaviors. The course explores a number of core social psychological domains (e.g., culture, motivation, emotion, person perception, empathy, decision making, interpersonal relationships, morality, and self-identity). *Prerequisite: (PSYC 251 or BIOL 243) and (NEUR 225 or NEUR 254 or PSYC 225 or NEUR 208 or PSYC 254).*

## 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 or PSYC 225 or PSYC 254) and (BIOL 243 or BIOL 233 or PSYC 251).*

**NEUR 417 History of Neuroscience: Brain and Society (4)**

A historical survey of neuroscience, from the end of the 18th century to the present. Students discuss the theoretical and technological advances related to our current understanding of the brain. *Prerequisite: (PSYC 251 or BIOL 243) and (NEUR 208 or NEUR 225 or NEUR 254 or PSYC 225 or PSYC 254).*

**NEUR 444 Independent Study (2 or 4)**

Students in this course will design and execute an experimental research project terminating in a written report or will complete readings in an area of neuroscience. Must be approved by the program chair. This course may be repeated for credit when the topic differs. *Prerequisite: Instructor prerequisite override required.*