

NEUROSCIENCE (NEU)

NEU 220: Sensation and Perception (3 credits)

This course will cover the basic psychology and neuroscience of sensation and perception with a focus on illusions and cognitive disorders that distort perception. We will apply the basic knowledge of sensation and perception to music, visual arts, time, attention, marketing, and education.

NEU 300: Neural Development (3 credits)

This course will cover the major concepts of developmental neurobiology. Recent advances in the understanding of the molecular and cellular events underlying neural induction, neural tube formation, cell differentiation, proliferation, migration, axon guidance, synapse formation, neurotrophic factors, and neural death will be discussed. The course will also focus on activity-dependent plasticity and its role in generating and maintaining synaptic input within the nervous system. Pathologies arising from failures of these processes will also be examined.

Prerequisite: A grade of C or better in BIO 110 and NEU 200.

NEU 305: Neurobiology (3 credits)

This course will cover the basic biological principles and processes involved in neural function from the cellular/molecular level, including the common architectural elements and functional processes of neurological systems.

Prerequisite: BIO 210 or NEU 345 or PSY 340

NEU 310: Animal Behavior (3 credits)

This course will introduce students to the basic principles derived from evolution, ecology, ethology and development and use these principles to explain how and why animals behave as they do in particular situations. The course will also focus on many important survival activities such as foraging, communication, migration, predator-prey interactions, mating, and paternal care.

Prerequisite: A grade of C or better in BIO 110 and NEU 200.

NEU 320: Neuropharmacology (3 credits)

This course will cover the basic principles underlying neurochemistry. Topics will include neurotransmitter function, synthesis and metabolism as well as signalling. In addition to normal neurochemistry, the course will introduce students to the chemical disturbances that underlie some mental illnesses such as schizophrenia and addiction.

Prerequisite: A grade of C or better in BIO 110

NEU 330: Neuroendocrinology (3 credits)

This course will cover the basic principles of neuroendocrinology with a focus on how hormones influence behavioral outcome. Animal models will be examined to explore how the endocrine and nervous systems interact to control functions such as reproductive behaviors, aggression, stress, biological rhythms, metabolism and fluid intake. Human neuroendocrine research will be included if available and appropriate.

Prerequisite: A grade of C or better in BIO 110 and NEU 200.

NEU 340: Cognitive Neuroscience (3 credits)

This course will introduce students to basic concepts in the history, neuroanatomy and methods of cognitive neuroscience. In addition topics related to sensation and perception, learning and memory, emotion, language, attention and impulsivity will be covered.

Prerequisite: A grade of C or better in BIO 110 and NEU 200.

NEU 345: Physiological Psychology (3 credits)

This course provides the student with a knowledge of the biological components of behavior. Basic neuroanatomy and neurochemistry are discussed with respect to a variety of topics such as emotions, sensation, aggression, sleep, memory, reproductive behaviors, eating disorders, and certain forms of psychopathology.

Prerequisite: BIO 112 or PSY 101 or NEU 220

NEU 350: Neurobiology of Mental Disorders (3 credits)

With the dramatic advances in neuroscience and psychiatry, we are able to identify the anatomical, chemical and psychological anomalies underlying many mental and nervous system disorders. These advances may help us find better treatment options as well as potential preventative measures. Using several different reading sources, the present course will cover epidemiology, symptoms, known causes, neurobiology and treatment of nervous system disorders such as autism, depression, bipolar disorder, schizophrenia, anxiety disorders as well as age-related diseases such as Parkinson's and Alzheimer's diseases.

Prerequisite: PSY 101 or BIO 110