

**NEUROSCIENCE** **NEU**

**Program in Neuroscience  
College of Natural Science**

**301 Introduction to Neuroscience I**  
Fall. 3(3-0) P: (BS 161 or BS 181H or LB 145) and (BS 162 or BS 191H or LB 145) RB: PSY 101 R: Open to undergraduate students in the Program in Neuroscience.

Survey of the field of neuroscience, including molecular, cellular, and autonomic, sensory and motor systems.

**302 Introduction to Neuroscience II**  
Spring. 3(3-0) P: NEU 301 RB: PSY 101 R: Open to undergraduate students in the Program in Neuroscience.

Survey of brain-based behavioral and cognitive systems and related human diseases.

**311L Neuroscience Laboratory (W)**  
Fall, Spring. 2(1-3) P: ((NEU 301 or concurrently) and completion of Tier I writing requirement) and (STT 201 or STT 231 or STT 421) and (BS 171 or BS 191H or LB 145) RB: PSY 101 R: Open to undergraduate students in the Program in Neuroscience.

Overview of neuroscience research methodology, including experimental design, data analysis, and presentation of results.

**420 Neurobiology of Disease**  
Spring. 3(3-0) P: NEU 301 and NEU 302 R: Open to undergraduate students in the Program in Neuroscience.

Genetic, molecular, cellular, systems, and behavioral abnormalities that contribute to the manifestation of neurologic and psychiatric diseases and disorders that affect the nervous system.

**490 Special Problems in Neuroscience**  
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course. A student may earn a maximum of 15 credits A student may earn a maximum of 15 credits in NEU 490 and NEU 492. P: (PSY 101 and NEU 301) and (STT 201 or STT 231 or STT 421) RB: NEU 302 and NEU 311L R: Open to juniors or seniors. Approval of department.

Students work under the direction of a faculty member on a selected research problem.

**492 Special Topics in Neuroscience**  
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. A student may earn a maximum of 15 credits A student may earn a maximum of 15 credits in NEU 490 and NEU 492. RB: PSY 101 R: Open to sophomores or juniors or seniors. Approval of department.

Current topics proposed by faculty that supplement regular course offerings.

**800 Neuroscience Research Forum**  
Fall, Spring, Summer. 1(1-0) A student may earn a maximum of 8 credits in all enrollments for this course. RB: Bachelor's degree in neuroscience, biological or psychological science, or related area.

Readings, presentations, and discussions of research literature in neuroscience. Professional development.

**804 Molecular and Developmental Neurobiology**  
Fall. 3(3-0) Interdepartmental with Pathobiology and Diagnostic Investigation and Pharmacology and Toxicology and Psychology and Zoology. Administered by Neuroscience. RB: Bachelor's degree in a Biological Science or Psychology. R: Open to graduate students in Neuroscience major.

Nervous system specific gene transcription and translation. Maturation, degeneration, plasticity, and repair in the nervous system.

**806 Strategies in Neuroscience Research**  
Fall, Spring. 3(0-9) Interdepartmental with Pharmacology and Toxicology and Physical Medicine and Rehabilitation and Physiology and Psychology and Radiology. Administered by Neuroscience. RB: PHM 827 R: Open to doctoral students in the Neuroscience major.

Methods and underlying principles of neuroscience research.

**811 Advanced Behavioral Neuroscience**  
Spring. 3(3-0) Interdepartmental with Psychology. Administered by Psychology. RB: (PSY 411) or approval of department. R: Open only to graduate students in the Psychology major or Neuroscience major.

Biological mechanisms involved in learning and memory, motivated behaviors, biological rhythms, and psychopathologies.

**820 Advanced Neuroanatomy**  
Summer of odd years. 1 to 5 credits. A student may earn a maximum of 12 credits in all enrollments for this course. Interdepartmental with Human Anatomy. Administered by Neuroscience. R: Approval of department.

Current topics in anatomy and physiology processes of central nervous system cells.

**827 Physiology and Pharmacology of Excitable Cells**  
Fall. 4(4-0) Interdepartmental with Pharmacology and Toxicology and Physiology and Zoology. Administered by Pharmacology and Toxicology. RB: PSL 431 or PSL 432 or BMB 401 or BMB 461 or ZOL 402

Function of neurons and muscle at the cellular level: membrane biophysics and potentials, synaptic transmission, sensory nervous system function.

**832 Evolution of Nervous Systems**  
Spring of odd years. 3(3-0) Interdepartmental with Zoology. Administered by Zoology. RB: Background in neurobiology or evolutionary biology recommended. R: Open to graduate students in the Department of Computer Science and Engineering or in the Program in Neuroscience or in the Department of Psychology or in the Department of Zoology or approval of department.

Evolutionary origins, mechanisms, and consequences of evolutionary change in nervous systems.

**839 Systems Neuroscience**  
Spring. 4(4-0) Interdepartmental with Human Anatomy and Pharmacology and Toxicology and Physiology and Psychology and Zoology. Administered by Neuroscience. R: Open only to graduate students in the Colleges of Human Medicine, Osteopathic Medicine, Agriculture and Natural Resources, Natural Science, Social Science, and Veterinary Medicine. SA: ANT 839

Anatomy, pharmacology, and physiology of multicellular neural systems. Sensory, motor, autonomic, and chemo-regulatory systems in vertebrate brains.

**890 Independent Study in Neuroscience**  
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course. RB: Bachelor's degree in neuroscience, biology, psychology, or related area.

Supervised student research on a specialized research topic in basic or clinical neuroscience.

**899 Master's Thesis Research**  
Fall, Spring, Summer. 1 to 36 credits. A student may earn a maximum of 99 credits in all enrollments for this course.

Master's thesis research.

**992 Advanced Topics in Neuroscience**  
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course. RB: (NEU 804 and NEU 811 and NEU 827) and Bachelor's degree in neuroscience, biology, psychology or related area.

Readings, presentations and discussion of specialized topics in neuroscience.

**999 Doctoral Dissertation Research**  
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 120 credits in all enrollments for this course.

Doctoral dissertation research.