Neuroscience Course Descriptions

**NSC 4352 Cellular Neuroscience** (3 semester hours) This course focuses on the cell biology and cellular physiology of the neuron. Growth and maintenance of dendrites, axons and synapses, and the underlying processes of macromolecule synthesis, packaging, and transporting are the central biological issues. Electrical signaling, ion channel functions, and synaptic transmission are the main physiological issues. Pre- or corequisite: BIO 2301 or NSC 4361. (Same as PSY 4352.) (3-0) Y

**NSC 4353 Neuroscience Laboratory Methods** (3 semester hours) This laboratory course provides hands-on experience with the use of electrophysiological techniques for the analysis of living neural preparations. Pre- or corequisite: NSC 4361 or BIO 2301. (This course fulfills the advanced writing requirement for Neuroscience majors and 3 hours of the Communication component of the Core Curriculum). (0-6) Y

**NSC 4354 Integrative Neuroscience** (3 semester hours) Examines the collective behavior of neuronal systems with respect to sensory processing, motor control, and the plasticity regulating more advanced behavioral, motivational, and cognitive functions. Prerequisite: NSC 4361 (Same as PSY 4354.) (3-0) Y

**NSC 4355 Advanced Neuroscience Laboratory** (3 semester hours) This laboratory course exposes students to a structured research project, with topics selected from the range of neuroscience faculty interests. It requires students to develop the rationale for experiments and to interpret their results. Each student writes a publication-style paper with reference to the scientific literature. Prerequisite: NSC 4353. (0-6) Y

**NSC 4356 Neurophysiology** (3 semester hours) This course focuses on the elements of neural functions ranging from the kinetics of channels in excitable membranes to the collective behavior of real neural networks. Prerequisite: NSC 4352. (Same as PSY 4356.) (3-0) Y

**NSC 4357 Brain and Memory** (3 semester hours) Current research and theory on modifications in the central nervous system that may underlie memory. Includes an overview of synaptic physiology and pharmacology, and development of the concept of neural plasticity from foundations in anatomy and physiology on the basis of electrical stimulation and pharmacological evidence. Includes discussion of applications such as amnesia. Pre- or corequisite: NSC 4361. (Same as PSY 4357) (3-0) T

**NSC 4361 Behavioral Neuroscience** (3 semester hours) Explores the nature of the brain processes underlying behavior, including consideration of basic neurophysiology and the physiology of sensation, learning, and emotion. Satisfies 3 hours of the Core Curriculum Science (non-lab) requirement. (3-0) S

**NSC 4363 Neuropharmacology** (3 semester hours) A survey of neurotransmitter functions with special emphasis on effects in the central nervous system. Emphasis is on receptor theory and neurochemistry, but neurotransmitter metabolism and release are also considered. Correlations between neurotransmitter activity and behavior and pathological states are discussed where appropriate. Prerequisite: NSC 4352 or NSC 4354. (Same as PSY 4363.) (3-0) Y

**NSC 4366 Neuroanatomy** (3 semester hours) Introduction to the anatomical organization and basic functional principles of the major sensory, motor, associational, and modulatory systems of the human brain. Students learn to identify visually specific structures on slides, magnetic resonance images (MRI), and dissected brain specimens in relation to neural pathways and system interconnections. This course provides a basis for a general understanding of the human brain and its functions in relation to disease and behavior. Prerequisite: NSC 4361 or BIO 2301. (Same as PSY 4366.) (3-0) Y

**NSC 4367 Developmental Neurobiology** (3 semester hours) Examines the processes guiding the proliferation, differentiation and migration of neurons as they form transient or long-lasting connections and circuits. Prerequisite: NSC 4352 or NSC 4354. (Same as PSY 4367.) (3-0) Y

**NSC 4368 Computational Neuroscience** (3 semester hours) Introduction to state-of-the-art computer methods for simulation of biologically realistic neuronal dynamics. Students must demonstrate some degree of computer skills. (3-0) R

**NSC 4375 Senior Honors Seminar** (3 semester hours) A course for students proposing to conduct undergraduate thesis research in the School of Human Development. The seminar will focus on different approaches to conducting research, current research topics in the school, and development of the student's thesis proposal. Credit/No Credit unless program head approves for letter grade. Permission of College Master required. (Same as CGS 4375, PSY 4375, and SPAU 4375.) (3-0) Y

**NSC 4394 Internship** (3 semester hours) Students earn course credit for field experience in an applied setting. Requires
working at least 8 hours per week at an approved community agency or business of the student's choice. Students keep daily job diaries, attend one class meeting per month, and write brief papers relevant to their experiences. Open to all students who have reached junior or senior standing (more than 53 hours). Apply for placements in the College Master's office. Must be taken on Credit/No Credit basis. (Same as CGS 4394, PSY 4394 and SPAU 4393.) (3-0) S

Special Topics

Topics under the following course number vary from semester to semester. The class schedule for the current semester will list the special topic that will be offered.

**NSC 4V90 Special Topics in Neuroscience** (1-6 semester hours) May be repeated for credit (9 hours maximum). ([1-6]-0)

Independent Study

The following independent study courses are advanced individualized projects to be arranged with a supervising professor. Open only to qualified students by consent of instructor. Students must contact professor and design a contract for study prior to enrollment. Permission forms are available in the College Master's office.

**NSC 4397 Honors Thesis** (3 semester hours) An independent study project in which the student writes an honors thesis under faculty supervision. (3-0) S

**NSC 4V98 Research in Neuroscience** (1-6 semester hours) Student assists faculty with research projects or conducts a research project under weekly faculty supervision. Taken on a Credit/No Credit basis unless Program Head approves for letter grade. May be repeated for credit. (3-0) S

**NSC 4V99 Independent Study in Neuroscience** (1-6 semester hours) Student studies advanced topics under weekly faculty direction and writes a paper. Taken for letter grade unless Program Head approves for a Credit/No Credit basis. May be repeated for credit. ([1-6]-0) S