**NEUROBIOLOGY (NBIO)**

**NBIO 101. Social and Ethical Issues in the Neurosciences. 2-4 Units.**
Foundational scientific issues and philosophical perspectives related to advances in the study of brain and behavior. Implications of new insights from the neurosciences for medical therapy, social policy, and broader conceptions of human nature including consciousness, free will, personal identity, and moral responsibility. Topics include ethical issues related to genetic screening and editing, desire and addiction, criminal behavior, the biology of sexuality, fetal pain, aging and neurodegenerative disease, brain-computer interfaces, and neural enhancement and the human future. May be taken for 2 units without a research paper. Same as: NBIO 201

**NBIO 198. Directed Reading in Neurobiology. 1-18 Unit.**
Prerequisite: consent of instructor. (Staff).

**NBIO 199. Undergraduate Research. 1-18 Unit.**
Investigations sponsored by individual faculty members. Prerequisite: consent of instructor.

**NBIO 201. Social and Ethical Issues in the Neurosciences. 2-4 Units.**
Foundational scientific issues and philosophical perspectives related to advances in the study of brain and behavior. Implications of new insights from the neurosciences for medical therapy, social policy, and broader conceptions of human nature including consciousness, free will, personal identity, and moral responsibility. Topics include ethical issues related to genetic screening and editing, desire and addiction, criminal behavior, the biology of sexuality, fetal pain, aging and neurodegenerative disease, brain-computer interfaces, and neural enhancement and the human future. May be taken for 2 units without a research paper. Same as: NBIO 101

**NBIO 206. The Nervous System. 6 Units.**
Structure and function of the nervous system, including neuroanatomy, neurophysiology, and systems neurobiology. Topics include the properties of neurons and the mechanisms and organization underlying higher functions. Framework for general work in neurology, neuropathology, clinical medicine, and for more advanced work in neurobiology. Lecture and lab components must be taken together.

**NBIO 218. Neural Basis of Behavior. 5 Units.**
Advanced seminar. The principles of information processing in the nervous system and the relationship of functional properties of neural systems with perception, behavior, and learning. Original papers; student presentations. Prerequisite: NBIO 206 or consent of instructor.

**NBIO 224. Glia and Neuroimmunology. 2 Units.**
The role of glia in the brain, including development, normal functioning, and disease. Topics include astrocytes, microglia, oligodendrocyte lineage, the blood brain barrier, and neuroimmunology with special emphasis on tools for studying glia. Preference to graduate students.

**NBIO 227. Understanding Techniques in Neuroscience. 2 Units.**
Topics include molecular, genetic, behavioral, electrophysiological, imaging, and computational approaches used in the field of neuroscience. Presentations and discussions led by senior graduate students, assigned readings from the primary neuroscience literature, and optional laboratory demonstrations. Intended for graduate students from any discipline and for advanced undergraduates in the biosciences, engineering, or medicine.

**NBIO 228. Mathematical Tools for Neuroscience. 2 Units.**
Student-instructed. For students with no math background beyond basic calculus, or as a review for more advanced students. Techniques useful for analysis of neural data including linear algebra, Fourier transforms, probability and statistics, signal detection, Bayesian inference, and information theory.

**NBIO 254. Molecular and Cellular Neurobiology. 3-5 Units.**
For graduate students. Includes lectures for BIO 154. Cellular and molecular mechanisms in the organization and functions of the nervous system. Topics: wiring of the neuronal circuit, synapse structure and synaptic transmission, signal transduction in the nervous system, sensory systems, molecular basis of behavior including learning and memory, molecular pathogenesis of neurological diseases. Same as: BIO 254

**NBIO 258. Information and Signaling Mechanisms in Neurons and Circuits. 4 Units.**
How synapses, cells, and neural circuits process information relevant to a behaving organism. How phenomena of information processing emerge at several levels of complexity in the nervous system, including sensory transduction in molecular cascades, information transmission through axons and synapses, plasticity and feedback in recurrent circuits, and encoding of sensory stimuli in neural circuits.

**NBIO 299. Directed Reading in Neurobiology. 1-18 Unit.**
Prerequisite: consent of instructor.

**NBIO 370. Medical Scholars Research. 4-18 Units.**
Provides an opportunity for student and faculty interaction, as well as academic credit and financial support, to medical students who undertake original research. Enrollment is limited to students with approved projects.

**NBIO 399. Graduate Research. 1-18 Unit.**
Investigations sponsored by individual faculty members. Prerequisite: consent of instructor.