NEUROSCIENCE (NSCI)

NSCI 150 First-Year Seminar (4 Credits)
An exploration of a specific topic in Neuroscience A grade of C- or better fulfills the COLL 150 requirement. Although topics vary, the courses emphasize academic writing skills, reading and analysis of texts, and discussion.
College Curriculum: C150

NSCI 300 Writing in the Neurosciences (0 Credits)
Students majoring in Neuroscience fulfill the major writing requirement by working with an individual faculty member, typically in a lecture or research course. Lecture courses that offer sections of NSCI 300 are PSYC 302, PSYC 413, PSYC 415, BIOL 433, BIOL 442 and CHEM 417. Declared majors should discuss the writing requirement with a faculty member during the first two weeks of the semester during which they would like to fulfill this requirement. Once accepted by a faculty member, the student will be given permission to enroll in the proper section of NSCI 300 by the faculty member. Students must register for this course during the add/drop period. The major computing requirement is satisfied by passing APSC 351 Cellular Biophysics and Modeling.

NSCI 305 Exploring Neuroscience: Molecules, Cells, and Synapses (3 Credits)
The purpose of this course is to explore the field of Neuroscience from a cellular and molecular perspective. Students will examine how individual neurons generate, integrate, and transmit information, and how these processes underlie thought, behavior, and sensory experience.
Prerequisite(s): BIOL 203

NSCI 306 Exploring Neuroscience: Brain Systems & Behavior (3 Credits)
The purpose of this course is to explore the field of Neuroscience from a brain systems and behavioral perspective. We will uncover how brain activity and networks underly behavior, thought, and emotion.
Prerequisite(s): PSYC 201

NSCI 351 Cellular Biophysics and Modeling (3 Credits)
An introduction to simulation and modeling of dynamic phenomena in cell biology and neuroscience. Topics covered will include the biophysics of excitable membranes, the gating of voltage- and ligand-gated ion channels, intracellular calcium signaling, and electrical bursting in neurons.
Prerequisite(s): (MATH 111 (may be taken concurrently) or MATH 131 (may be taken concurrently)) and (BIOL 203 (may be taken concurrently) or BIOL 225 (may be taken concurrently)) and (BIOL 345 (may be taken concurrently) or NSCI 305 (may be taken concurrently))

NSCI 400 Research in Neuroscience (1-3 Credits)
Students will gain hands-on experience with Neuroscience research by working in a Neuroscience faculty member's laboratory. Neuroscience students attaining a total of 3 credit hours can use this course to fulfill one of their electives. Hours to be arranged.

NSCI 451 Mechanisms of Neurodegenerative Diseases (3 Credits)
We will explore diseases including, but not limited to, ALS, dementia (with a specific focus on Alzheimer's disease), Parkinson's disease, and Huntington's disease. The course will delve into theories involving neuroinflammation, protein misfolding, genetic factors, and mitochondrial dysfunction. The curriculum includes lectures where disorders are introduced and potential mechanisms are discussed, as well as seminar-style classes that provide opportunities for students to discuss and present primary research papers on current and potential new treatments.
Prerequisite(s): BIOL 310 (may be taken concurrently) and BIOL 345
College Curriculum: C400

NSCI 453 Neurophysiology (3 Credits)
This advanced laboratory and lecture course provides an in-depth, hands-on exploration of how neurons generate, transmit, and integrate electrical signals. Students investigate the fundamental physiological mechanisms of the nervous system through experiments using invertebrate model organisms and standard neurophysiology preparations. Core topics include resting membrane potential, action potential generation and propagation, synaptic transmission, sensory transduction, and circuit-level activity such as central pattern generation.
Prerequisite(s): BIOL 310 and BIOL 345
College Curriculum: C400

NSCI 465 Special Topics in Neuroscience (1-4 Credits)
Courses concerning special topics not covered in detail in regular course offerings. Courses may be repeated for credit if the topic varies.
Prerequisite(s): PSYC 201 or BIOL 203

NSCI 490 Neuroscience Capstone (0 Credits)
This course is a capstone experience involving synthesis of an original research project into a research paper. It may additionally include a presentation at the William & Mary Undergraduate Science Research Symposium, Neuroscience Symposium or another research conference. When coupled with a total of 3 credits of NSCI 400 (taken prior to, or concurrently to enrollment in NSCI 490) this will meet the College 400 requirement.
Prerequisite(s): NSCI 400 (may be taken concurrently)
College Curriculum: C400

NSCI 495 Honors (3 Credits)
Neuroscience Honors students complete empirically-based research projects that are conducted under the supervision of a Neuroscience faculty member. Intention to pursue honors must be filed with the Charles Center no later than the first day of classes of the semester in which the student will begin their thesis. This is usually the fall semester of their senior year (two semesters before graduation). In order to graduate with a degree with Honors in Neuroscience a student must (a) complete a written thesis that will be submitted to the honors examination committee at least two weeks before the last day of classes and (b) pass, with satisfactory performance, a comprehensive oral examination.

NSCI 496 Honors (3 Credits)
Neuroscience Honors students complete empirically-based research projects that are conducted under the supervision of a Neuroscience faculty member. Intention to pursue honors must be filed with the Charles Center no later than the first day of classes of the semester in which the student will begin their thesis. This is usually the fall semester of their senior year (two semesters before graduation). In order to graduate with a degree with Honors in Neuroscience a student must (a) complete a written thesis that will be submitted to the honors examination committee at least two weeks before the last day of classes and (b) pass, with satisfactory performance, a comprehensive oral examination.
College Curriculum: C400