

Neuroscience Courses

Neuroscience

WCSAM 400 Science Capstone (2)

This capstone seminar provides students with an opportunity to extend their learning through designing and conducting an interdisciplinary science capstone project in small teams. Students will learn how to develop and complete collaborative STEM (science, technology, engineering, and mathematics) research projects, and present their work both on campus and in the local community. This course is designed to complement senior projects within students' majors, and satisfies the WCore Capstone requirement. (WCore: SC)

NEURO 117 Yep, Brains are Cool! (4)

In this course, we will explore a variety of topics important to anyone who owns and uses a brain. In particular, we will focus on brain development in late adolescence and emerging adulthood and will use our brains to understand how we research brains. The course will be framed around a central question – "How do we know that?" We will look at current research on brain development during the transition to young adulthood, examine strengths and weaknesses of methods used to conduct that research, and discuss the practical application of such knowledge to the students' own lives. In addition, we will discuss the ways in which said research has been used to shape parenting and educational practices as well as public policy over the past decade. (WCore: WCSAM, RE)

NEURO 120 Genetics of Human Behavior (4)

Have you ever wondered how much your genes affect who you are? This course is an exploration of the role of genetic inheritance on human behavior. We will focus on modern genetic analysis and the molecular techniques used to study both complex normal human behaviors and diseases. Lab exercises, data analysis, and case studies will be integrated throughout to familiarize students with the process and methods of science. (WCore: WCSAM, QE)

NEURO 205 Introduction to Brain and Behavior (4)

This class will serve as an introductory course for students interested in the biological bases of human behavior. Topics will include an overview of central nervous system structure, function, and development, and will also include an introduction to emotional and cognitive processing in the brain. This course serves as a prerequisite for NEURO 306, 402, and 408. In addition, the course may be used to fulfill the distribution requirement in the psychology major.

NEURO 302 Research Methods in Neuroscience (4)

Students will be introduced to neuroscience research methods from varying levels of analysis (molecular/cellular, systems, human) as well as the fundamentals of hypothesis testing and experimental design. An emphasis on research design and reading and writing empirical literature is included. (WCore: RE)

NEURO 305 Human Brain Development (4)

This course explores human brain development from conception through death. The course focuses on anatomical changes and related changes in behavior, as well as potential genetic and environmental influences on brain development. In addition, we will learn about research addressing methods to foster healthy brain development.

NEURO 306 Behavioral Neuroscience (4)

Behavioral Neuroscience explores the ways that organisms perceive and behave in the world. The course emphasizes neuronal function, circuits, senses and perception, learning and memory, social behaviors, and the evolution of behavior – in organisms ranging from humans to praying mantises. We will have topical lectures and discussions of modern behavioral research to help students understand the fundamental principles of behavioral physiology. Lab course (NEURO 306L) is required.

NEURO 306L Behavioral Neuroscience Lab (0)

This lab section is a required complement to NEURO 306. In this section, students working in research teams will explore a variety of experimental techniques to test hypotheses. We will use techniques including electrophysiology, behavioral assays, and some molecular biology to address questions about how sensory stimuli are encoded, how neuromodulators affect that coding, and how neuroanatomy and neurophysiology are intimately linked.

NEURO 401 Directed Studies (1-4)

A tutorial-based course used only for student-initiated proposals for intensive individual study of topics not otherwise offered in the Neuroscience Program. Requires consent of instructor and school dean. This course is repeatable for credit.

NEURO 402 Behavioral Endocrinology (4)

This course explores the role of hormones in complex behaviors. Topics covered include biological contributions to reproductive, parenting, aggressive, and stress related behaviors in both animals and humans.

NEURO 403 Cellular Neuroscience and Lab (4)

The focus of this course is molecular and cellular neuroscience, including neuronal differentiation, cell structure, function, and connectivity. We will focus on how neurons are made, communicate, and are connected into circuits. Model systems used to study neuroscience will be introduced and we will use primary literature throughout. The laboratory will include research projects that are designed and carried out by the students.

NEURO 408 Cognitive Neuroscience (4)

Cognitive neuroscience, as a field, seeks to discover how the brain enables the mind and embraces methods and knowledge from such fields as physiological psychology, neuropsychology, neuroscience and cognitive psychology, along with multiple techniques of neuroimaging, to attempt an understanding of human brain processes. Brain activity involved in such higher level processes as language, memory, and executive functions is explored via a review of current literature. Students will design experiments appropriate for use with the methods of cognitive neuroscience.

NEURO 408L Cognitive Neuroscience Lab (0)

In this laboratory section that must be taken with Cognitive Neuroscience (NEURO 408) students will design experiments appropriate for use with the methods of cognitive neuroscience.

NEURO 409 Advanced Topics in Neuroscience (2)

This course explores current topics in neuroscience across a variety of levels of analysis from molecular/cellular through behavioral. Students read current literature and propose research experiments incorporating multiple levels of analysis. (WCore: SC)

NEURO 430 Independent Thesis Research (2)

Students undertake an independent research project or a substantive portion of an ongoing research project and learn all aspects of scientific inquiry. One credit hour equates to three hours per week in the laboratory. This course may be taken for no more than two semesters. A research proposal and permission of a faculty mentor is required.

NEURO 434 Social Neuroscience (4)

How is the brain involved in social processes and behavior, and how do our interactions with other people modify and shape the brain? In this course, students will learn about the interdisciplinary field of social neuroscience, the study of the neural bases of social behavior. This course will emphasize basic brain structures, functions, and mechanisms and processes implemented in social interactions, and how social behavior is shaped by biology and experience. Topics will include brain scanning technologies and methods, behavioral research methodologies, self and other representations in the brain, self-regulation, intergroup perceptions, emotion, motivation, attraction and interpersonal relationships, aggression, social rejection, and prosocial behavior.

NEURO 440 Internship (1-8)

Offers students the opportunity to integrate classroom knowledge with practical experience.
Prerequisites: junior or senior standing (for transfer students, at least 15 hours completed at Westminster or permission of instructor), minimum 2.5 GPA, completion of the Career Resource Center Internship Workshop, and consent of program director and Career Center Internship Coordinator. This course is repeatable for credit.
REGISTRATION NOTE: Registration for internships is initiated through the Career Center website and is finalized upon completion of required paperwork and approvals. More info: 801-832-2590
<https://westminstercollege.edu/about/resources/career-center/internships>