

NEUROSCIENCE AND BEHAVIOR (NEURO)

NEURO-100 Introduction to Neuroscience and Behavior

Fall and Spring. Credits: 4

This comprehensive survey course explores the brain and the biological basis of behavior. We will examine the anatomy of the nervous system and the unique properties of the cells that make up the brain. We will discuss the mechanisms by which individual brain cells communicate with each other, and how networks of cells underlie more complex processes such as perception, learning, memory, and behavior.

Applies to requirement(s): Math Sciences

K. Colodner, M. Sabariego

Restrictions: This course is limited to first-years and sophomores.

Coreq: NEURO-100L.

NEURO-221 Research Techniques in Neuroscience

Spring. Credits: 4

This course will introduce students to modern techniques utilized in neuroscience research. Students will learn the underlying principles of an array of techniques spanning the fields of cellular/molecular, behavioral, and cognitive neuroscience. In lab, students will perform experiments that demonstrate these skills firsthand. Emphasis will be placed on the tools necessary to implement these studies, proper experimental design, and the critical interpretation of generated data.

Applies to requirement(s): Math Sciences

K. Colodner

Restrictions: This course is offered to neuroscience majors only.; Course limited to sophomores, juniors and seniors

Prereq: NEURO-100. Coreq: NEURO-221L.

NEURO-246 Cognitive Neuroscience

Fall. Credits: 4

Cognitive psychologists investigate the features and functions of the human mind through behavioral techniques; neuroscientists explore the physiology of the human brain. Cognitive Neuroscience lies at the intersection of these disciplines, and asks questions like: How are memories represented in the brain? Is our brain pre-prepared to learn language and if so, how? How does the average human brain still outperform most face recognition software? This course explores the cognitive and neural processes that support vision, attention, language, memory, and music. It introduces basic neuroanatomy, functional imaging techniques, and behavioral measures of cognition.

Crosslisted as: PSYCH-246

Applies to requirement(s): Social Sciences

M. Breen

Prereq: PSYCH-100, NEURO-100, or AP Psychology.

Notes: This course counts in the cognitive or biol bases area of the psychology major.

NEURO-254 Psychopharmacology

Spring. Credits: 4

Psychopharmacology focuses on the impact that drugs (both illicit and prescription) have on the brain, neurocircuitry, and behavior. Students will explore the underlying neurotransmitter systems of the brain and discover how substances influence nervous system function including the experience of pain, sleep, emotional states, motivation, addiction, and mental health. The course will bridge concepts in chemistry, biology, psychology, and neuroscience by highlighting major drug classes and their underlying mechanisms of action. Additional discussions will focus on the economic, social, and political aspects of the drug market, as well as ethics and legalities of the drug industry.

Crosslisted as: PSYCH-254

Applies to requirement(s): Social Sciences

J. Schwartz

Prereq: PSYCH-100, NEURO-100, or AP Psychology.

NEURO-256 Hormones and Behavior

Not Scheduled for This Year. Credits: 4

Does the idea of Finals Week stress you out? Have you ever felt hungry or thirsty? Is our biology to blame when people cheat on their partners? From mental health and hunger to sexual motivation and aggression, our hormones dictate many of our basic choices and ultimately control how we interact with our world. This course will explore how hormones communicate with our brain to influence behaviors such as sexual attraction and reproduction, parental care, and social behavior. Special emphasis will be placed on the underlying biology and role of the nervous system in regulating hormone levels.

Crosslisted as: PSYCH-256

Applies to requirement(s): Social Sciences

T. Hodges

Prereq: PSYCH-100, NEURO-100, or AP Psychology.

NEURO-295 Independent Study

Fall and Spring. Credits: 1 - 4

The department

Instructor permission required.

NEURO-309 Topics in Neuroscience and Behavior

NEURO-309NE Topics in Neuroscience and Behavior: 'Neuroethics'

Spring. Credits: 4

Neuroethics draws on the tools of philosophical analysis to investigate the role of neuroscience in our personal, social, and ethical lives. This class will look at the ethics of neuroscientific interventions such as cognitive enhancement, mind reading, and lie detection. We will examine how the neurosciences might inform philosophical discussions about human nature, personality, and ethics. In addition, we will look at the evidential role of neuroscientific evidence and how neuroscience technologies such as fMRI have influenced our thinking about the mind/brain and person.

Crosslisted as: PHIL-334NE, PSYCH-359NE

Applies to requirement(s): Humanities

L. Sizer

Prereq: 8 credits from the Philosophy department or 4 credits from Philosophy and 4 credits from Neuroscience and Behavior.

NEURO-309SE Topics in Neuroscience and Behavior: 'Philosophy and Science of Emotion'*Not Scheduled for This Year. Credits: 4*

This course is an interdisciplinary investigation of the nature of emotions and their influences on our thoughts and actions. While we will draw from a variety of disciplines, the nature and motivations of the inquiry are philosophical. We will consider: what are emotions? Are they bodily responses? Thoughts? Feelings? What roles do cultures play in shaping our emotions? What functions do emotions serve? We will examine evidence and arguments offered by philosophy, psychology, neuroscience, anthropology and evolutionary theory, and consider how these perspectives do or don't inform each other, as well as how they can help us understand the nature of emotions.

*Crosslisted as: PHIL-350SE**Applies to requirement(s): Humanities**Other Attribute(s): Writing-Intensive**L. Sizer**Prereq: 8 credits in Philosophy or Neuroscience and Behavior, or 4 credits in each.***NEURO-324 Cellular and Molecular Neuroscience***Not Scheduled for This Year. Credits: 4*

This course will explore cellular and molecular mechanisms of nervous system development and function through lectures, laboratory exercises, and the critical analysis of primary literature. Topics include synapse formation and synaptic transmission, neuronal-glial interactions, the molecular basis of behavior, and applied genetic engineering techniques.

*Applies to requirement(s): Math Sciences**K. Colodner**Prereq: NEURO-221 or BIOL-230.**Notes: This course meets the 300-level laboratory-based course requirement for the Neuroscience and Behavior major.***NEURO-331 Glial Cells in Health and Disease***Not Scheduled for This Year. Credits: 4*

This course will explore the "other" cells in your brain, the glial cells. While neuronal cells receive most of the attention, glial cells are now recognized as essential players in normal brain physiology. Through the critical analysis of primary literature, we will highlight recent advances in glial cell biology and discuss how the various glial cell subtypes (astrocytes, microglia, myelinating cells, etc.) contribute to the healthy and diseased brain. We will examine the glial contribution to a variety of disorders (e.g. multiple sclerosis, spinal cord injury, neurodegenerative diseases, etc.) as we cultivate a better understanding of these often overlooked brain cells.

*Applies to requirement(s): Math Sciences**K. Colodner**Restrictions: This course is offered to neuroscience majors only.**Prereq: NEURO-100 and BIOL-230.***NEURO-336 Systems Neuroscience***Fall. Credits: 4*

This course will cover the functioning of neural circuits in the brain and how they give rise to cognition and behavior. Using primary literature and activities, students will delve into current topics in systems neuroscience. Labs will provide exposure and training in common neuroscience techniques, practice in thinking like a scientist, and an appreciation for how basic research can lead to major advances in the treatment of disease.

*Applies to requirement(s): Math Sciences**Other Attribute(s): Speaking-Intensive**M. Sabariego**Restrictions: This course is offered to neuroscience majors only.**Prereq: NEURO-100 and PSYCH-204. Coreq: NEURO-336L.**Notes: Open to Neuroscience majors only for the first week of pre-registration; open to Psychology and Biology majors after the first week.***NEURO-338 Mobilizing the Hippocampus***Spring. Credits: 4*

This course will provide a research site to investigate the functions of the hippocampal brain region to then embody that learning through choreographic structures. In particular, students will use dance expression to aid the understanding of complex neuroscience topics, and apply neuroscience knowledge to deepen creative expression. "Mobilizing the hippocampus" will help to bridge a gap between science and art, serving as a tool to stimulate a heightened understanding of both disciplines.

*Crosslisted as: DANCE-338**Applies to requirement(s): Meets No Distribution Requirement**B. Diewald, M. Sabariego**Restrictions: This course is open to juniors and seniors; This course is limited to Dance and Neuroscience majors.***NEURO-341 Advances in Neuroscience***Not Scheduled for This Year. Credits: 4*

Neuroscience is a rapidly changing field. This seminar will prepare students for the next generation of neuroscience while also providing the foundation for important principles that have guided the field during the last few decades. In particular, using primary literature to guide the discussion, this class will examine topical subjects of modern neuroscience that are shaping our understanding of how the brain works.

*Applies to requirement(s): Math Sciences**K. Colodner**Restrictions: This course is offered to neuroscience majors only.**Prereq: BIOL-230 and PSYCH-204.***NEURO-395 Independent Study***Fall and Spring. Credits: 1 - 8**The department**Instructor permission required.*