The courses listed on this page are exclusive to the LPS BAAS degree (https://lpsonline.sas.upenn.edu/features/what-bachelor-applied-arts-and-sciences-degree/) and LPS Online certificates (https://lpsonline.sas.upenn.edu/academics/certificates/).

**NEUR 100 Introduction to Neuroscience**
This course serves as an introduction to the structure and function of the vertebrate nervous system. We begin the course with the study of nerve cells: their basic structure, how they establish and maintain the resting membrane potential, how they propagate an action potential, and how they transfer information via the process of neurotransmission. We next move into an investigation of the anatomy of the central nervous system (brain and spinal cord) with an emphasis on neurodevelopment. With the above knowledge in hand, we move into the sensory systems and investigate smell, hearing, vision, and pain sensation by focusing on how physical stimuli (such as sound waves) are converted into neural signals, where these signals travel in the brain, and how they are processed. We finish the course with an investigation into the function of the various motor systems and the autonomic nervous system.

Activity: Online Course
1.0 Course Unit

**NEUR 160 The Neuroscience of Music**
Music is a biological mystery: a ubiquitous human behavior with no obvious value for survival. Why do all human cultures have music? What accounts for the common threads running through the world's music? We look for answers by looking at the auditory system: the ear and especially the brain, in humans and in animals. Topics like musical universals, consonance and dissonance, scale structure, music, and emotion, music theory, talent, and improvisation are greatly illuminated by thinking about their neurobiological foundations. You have the option to enroll in this individual course without committing to the entire Certificate in Neuroscience, enjoying the flexibility and expertise offered by Penn LPS Online to suit your schedule and interests. BAAS students, certificate students, and those taking individual courses must first complete NEUR 100 before enrolling in this course.

Taught by: Michael Kaplan
Activity: Online Course
1.0 Course Unit

**NEUR 200 Behv Neuroscience**
An introduction to the experimental analysis of natural animal behavior and its neurobiological basis. Behavior is examined in an evolutionary and ecological context, and questions are focused on the neural processes that allow animals to carry out critical activities such as locating prey and finding mates. The course is comparative and strives to identify common principles in sensory and motor processing and brain function.

Activity: Online Course
1.0 Course Unit

**NEUR 260 Hormones, Brain, Behavior**
This course aims to introduce students to important interactions between the brain, behavior, and endocrine systems. Students learn about diverse vertebrate species, a variety of physiological systems, and the molecular mechanisms of hormone action. The specific neuroendocrine systems to be studied include reproduction, social bonding, fluid and energy balance, and emotional regulation. In addition, students develop skills required for critical reading of primary neuroscience literature and scientific communication.

Activity: Online Course
1.0 Course Unit

**NEUR 280 Autonomic Pharmacology**
In this course, students learn how the central nervous system regulates the activity of peripheral tissues to maintain homeostasis in the body. Output from the autonomic nervous system affects a variety of physiological parameters, including blood glucose levels, blood pressure, and ingestive behaviors. Students then apply the knowledge of the autonomic outflow to understand the actions of a variety of classes of drugs, including those prescribed for diabetes, hypertension, and other conditions.

Taught by: n/a
Activity: Online Course
1.0 Course Unit

**NEUR 400 Psychopharmacology**
Students examine drugs used in the treatment of central nervous system (CNS) dysfunction, including psychiatric diagnoses and neurodegenerative diseases. Explore the strategies, techniques, and challenges of psychopharmacological research and the use of drugs to probe neural substrates of behavior. Introductory material will be followed by advanced discussion of specific topics through the reading and discussion of primary journal articles.

Taught by: Jennifer Heerding
Activity: Online Course
1.0 Course Unit