Specific structures in different planes of sections along the major axes of hindbrain, and spinal cord. As part of this, students learn to recognize tracts within each subdivision of the central nervous system so that level describes the 3-D spatial relationships among the nuclei and fiber both grossly and at the level of functional circuits. Material at the gross neural system. The structural organization of the brain is then described output transformations that define the functional character of each neurochemical variations endow neurons with specific computational physiological properties so that connections between different neuronal subtypes students learn how structural and modern experimental methods that are used to determine how brain circuits are altered by experimental manipulations. While the course emphasizes the mammalian nervous system, many aspects of brain organization in non-mammalian vertebrates are presented. In the last third of the course, students read a monograph focused on the principles that guided vertebrate brain evolution across different phylogenetic lineages. A series of lectures are devoted to neuroanatomy and the evidence that has prompted competing theories of brain evolution so that students can critically evaluate differences in brain organization across different groups of vertebrates.

**NEURO 515: Developmental Neurobiology**

2 Credits

Development of the nervous system in all its aspects.

Cross-listed with: ANAT 515

**NEURO 520: Cellular and Molecular Neuroscience**

3 Credits

An introduction to neurons, glia, and the molecular basis of brain function.

**NEURO 521: Systems Neuroscience**

3 Credits

An introduction to the major neural systems and their integrative functions.

**NEURO 522: Seminars in Neuroscience I**

2 Credits

Study at the cellular, molecular, and metabolic level of selected subjects in neuroscience.

**NEURO 523: Seminars in Neuroscience II**

2 Credits

Study at the cellular, molecular, and metabolic level of selected subjects in neuroscience.

**NEURO 524: Neuroscience Bootcamp**

2 Credits

This is a laboratory course that meets twice weekly. The goal of this course is to engage incoming graduate students in the Neuroscience Program to a didactic/hands-on methods-based primer and overview of modern neuroscience laboratory methodology. After successful completion of this course, students will be able to: Demonstrate
an understanding of basic laboratory safety and standard laboratory practices. Demonstrate an understanding of how to keep data and records in a proper laboratory notebook. Demonstrate an understanding of basic laboratory approaches used in a modern neuroscience research lab to address questions in neuroscience. Demonstrate an understanding of how to perform and interpret laboratory experiments and analyze data acquired from those experiments.

NEURO 530: Professional Development and Responsible Conduct in Science
1 Credits
An introduction to the professional skills necessary for careers in biomedical sciences.

NEURO 590: Colloquium
1-3 Credits/Maximum of 3
Continuing seminars which consist of a series of individual lectures by faculty, students or outside speakers.

NEURO 596: Individual Studies
1-9 Credits/Maximum of 9
Creative projects, including nonthesis research, which are supervised on an individual basis and which fall outside the scope of formal courses.

NEURO 597: Special Topics
1-9 Credits/Maximum of 9
Formal courses given on a topical or special interest subject which may be offered infrequently; several different topics may be taught in one year or semester.

NEURO 600: Thesis Research
1-15 Credits/Maximum of 999
Thesis Research

NEURO 601: Ph.D. Dissertation Full-Time
0 Credits/Maximum of 999
No description.

NEURO 602: Supervised Experience in College Teaching
1 Credits/Maximum of 2
Supervised experience in teaching and orientation to other selected aspects of the profession at The Pennsylvania State University

Prerequisite: NEURO 511, NEURO 520, NEURO 521