

Neuroscience

General Description:

Neuroscience is a course designed for graduate students. The course provides a foundation in neuroscience and experience in the laboratory. Students in the course will access on-line lectures and take quizzes at their own pace. Lectures cover the cellular and synaptic organization of the brain, as well as functional neuroanatomy. Topics include sensation, motor control, language and emotions, together with the effects of common brain lesions. The latter part of the course is devoted to human brain dissection. This neuroscience course highlights many of the important principles of medical neuroscience.

Teaching methods include on-line lectures and quizzes, and lab. “Spotlight” cases are provided between lectures to provide opportunities for students to review and discuss major concepts. Assessments are in the form of open- book quizzes.

Course Objectives:

1. Describe the different cells of the CNS.
2. Describe the gross anatomy of the brain, brainstem, and the spinal cord.
3. Identify and explain the function of the meningeal layers.
4. Describe the ventricular system and the flow of cerebrospinal fluid.
5. Explain the general functions of the cerebellum, basal ganglia and upper and lower motor neurons in motor control.
6. Describe the receptors, anatomy and function of the ascending somatosensory pathways of the spinal cord.
7. Describe the receptors, anatomy and function of the visual, auditory, vestibular and chemosensory systems.
8. Describe the cortical areas that contribute to cognition, attention, sensory processing, and language.
9. List the clinical signs that would occur with lesions and diseases to the various parts of the central nervous system.
10. Identify the structures, functional pathways and processes involved in memory and emotion.
11. Identify the major parts of the brain, and important functional

neuroanatomical structures on real brains (lab component).

NOTE: Specific learning objectives are provided for individual lectures.

Recommended text:

Bear, Neuroscience: Exploring the Brain, 4e Philadelphia: Lippincott Williams and Wilkins.

RWJMS Medical Lab Manual Labs 1 and 3.

Purves et al. (2008) Neuroscience, 5th edition (2008) Sunderland Mass: Sinauer. ISBN: 978-0-87893-695-3.

*Note: this is also available for less money in eBook form (ISBN 978-0-87893-587-1) for iPad and mobile devices or in Looseleaf textbook format (ISBN: 978-0-87893-646-5)