

SYLLABUS

SPRING 2009

COURSE: HCS-7344-001 FUNCTIONAL HUMAN NEUROANATOMY

Instructor: Aage R. Møller Ph.D.

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Class schedule: Main Campus:

Tuesday-Thursday 4:00-5:15PM

January 13, 2009

GR 4.204

Class text: Brodal, P. The Central Nervous System, 3rd Edition, 2004,

ISBN 0-19-516560-8

Supplementary readings:

Shepherd G. Neurobiology 3rd ed.

Oxford Press, New York 1994 ISBN 0-19-508843-3

Zigmond MJ, Bloom FE, Landis SC, Roberts JL, Squire LR: Fundamental Neuroscience, San Diego, Academic Press, 1999 ISBN 0-12-780870-1

Grading:

1. Midterm Exam February 24: Covers the first section to February 17
2. Final Exam May 5

Course purpose: The purpose of this class is to develop an understanding of the anatomy and function of the human nervous system, and some disorders of the central nervous system.

General objectives:

Students will:

Sensory Neurophysiology NSC 4373 Fall 2008

1. Understand the basic anatomy and function main structures of the central nervous system
2. Understand the general function of the lateral tracts of the motor system
3. Understand the general function of the medial tracts of the motor system
4. Understand the anatomy and the function of the basal ganglia
5. Know anatomy and function of spinal reflexes
6. Understand the role of proprioception in motor control
7. Understand the general anatomy and function of cranial nerves
8. Anatomy and function of cranial nerve reflexes including the vestibular ocular reflex
9. Know the anatomy of sensory organs and the differences between different senses.
10. Know the anatomy of ascending sensory pathways
11. Understand the difference between classical and non-classical ascending sensory pathways.
12. Know the anatomy of efferent sensory systems and some of their functions
13. Understand how sensory information can reach structures of the limbic system
14. Understand the role of neural plasticity in motor function
15. Understand the role of neural plasticity in sensory function
16. Understand the pathophysiology of some common disorders that affect the function of motor systems
17. Understand the pathophysiology of some common disorders that affect the function of sensory systems
18. Know the anatomy and the basic functions of the different structures of the limbic system
19. Understand the anatomical and functional basis for cognitive functions

Course layout

This is a systems oriented course that covers the anatomical organization and the physiology of the central nervous system including the sensory motor pathways. The course describes the anatomy and basic features of sensory and motor systems, limbic systems and the anatomical and functional basis for cognitive functions. The generation and processing of motor commands, and processing of sensory signals are covered in detail. The anatomy of the two main motor systems and the two main sensory systems is described and their similarities are emphasized. The role of the basal ganglia and the cerebellum in motor control, and spinal and reflexes in motor control is discussed. The transformation of sensory signals that occurs in the nuclei of the classical ascending neural pathways and the processing that occurs at different levels of the central nervous system is discussed. The pathophysiology of some common disorders of motor and sensory systems and the role of neural plasticity in creating symptoms and signs of disease are discussed.

OUTLINE

Basic building blocks of the central nervous system

Cerebral cortex

Brainstem

Spinal cord

Autonomic nervous system

Cranial nerves

Spinal nerves

Spinal reflexes

Central motor pathways

Basal ganglia

Cerebellum

Proprioception

Subcortical coordination of motor and sensory functions

Somatosensory systems

Balance system

Limbic system

Pain pathways

Central pain

Neural plasticity

Development of the nervous system

Aging

Midterm exam: February 26, 2009

Final exam: May 7, 2009

11/3/08