The Hebrew University of Jerusalem

Syllabus

Human Neuroanatomy - 94101

Last update 27-10-2016

HU Credits: 2

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Bio-Medical Sciences

Academic year: 0

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: Ein Karem

Course/Module Coordinator: prof. Lili Anglister

Coordinator Email: lilia@ekmd.huji.ac.il

Coordinator Office Hours: Mon 11-13, appointment by Email

Teaching Staff:

Dr.
Prof Lili Anglister
Ms. Moriel Ben-Zvi
Ms. Noam Saadon-Grosman
Ms. Sivan Gelb
Mr. Michael Yunerman

Course/Module description:

The course is composed of two integrated sections; frontal lectures in Neurobiology and Neuroanatomy (total of 40 x 1-hour lectures) and gross anatomy laboratory dissections of the human brain (total of 21 hours; based on self-study aided by additional 13 x 1-hour frontal lectures). Topics covered in the first section (Neurobiology and Neuroanatomy) include an introduction to the cellular composition of the Nervous System (neurons, glia and synapses) and their organization into anatomical-functional circuits, spinal-cord and peripheral nerves, autonomic Nervous System, trophic interactions between neurons and glia cells and between neurons and target cells they innervate, the response of the Nervous System to trauma (e.g. degeneration, denervation, regeneration and re-innervation), general sensory systems (e.g. touch, pain and ascending pathways), visual system, auditory system, motor system (e.g. spinal cord, descending motor pathways, cerebellum, basal ganglia and the integration of motor control), limbic system and hypothalamus, functional organization of the cortex and higher brain functions (e.g. language).

Course/Module aims:

Provide students with knowledge of the detailed structures and functions of the central (brain, spinal cord) and peripheral nervous system, based on general developmental and neurobiological principles, and to result in students understanding of the correlation between the structure and function in the nervous system under normal healthy conditions and the consequences of trauma, lesions or neurological diseases.

Learning outcomes - On successful completion of this module, students should be able to:

• Recognize in detail the gross anatomy of the Nervous System: brain and periphery.
• Explain how the nervous is constructed based on organization, using developmental and neurobiological principles.
• Understand and explain how the nervous system carries out all the functions in the normal healthy human: sensation, movement, emotion, and higher brain functions.
• Understand and predict the consequences of specific injuries and neurological diseases.

Attendance requirements(%):
100% in labs, conventional in lectures

Teaching arrangement and method of instruction: Lectures & laboratories of human brain dissections with personal guidance and discussions, combined with practice using computer software with 3D imaging designed for the study of the brain structure and function.

Course/Module Content:
Part A - Lectures in Neurobiology and systems:

• Introduction to the cellular composition of the Nervous System (neurons, glia and synapses) and their organization into anatomical-functional circuits.
• Spinal-cord and peripheral nerves.
• Autonomic Nervous System.
• Tropic interactions between neurons and glia cells and between neurons and target cells they innervate.
• The response of the Nervous System to trauma.
• General sensory systems.
• Visual system.
• Auditory system.
• Motor system.
• Limbic system and hypothalamus.
• Functional organization of the cortex and higher brain functions.

Part B - Structure of the Human Brain (lectures and lab):
• General topography of the brain and spinal cord, development, meninges, ventricles, CSF circulation, blood supply, cranial nerves
• The cerebrum: hemispheres, cortex and topography, white matter, basal nuclei (ganglia), amygdala, internal capsule

• Diencephalon, lateral and third ventricles, development of the diencephalon, cerebrum and temporal lobe. Choroid plexus and CSF formation
• Sections through the brain: identification of structures in sections and imaging
• Brainstem, cerebellum:
midbrain, pons, medulla- nuclei and tracts. Functional anatomy of the cerebellum.
• Forth ventricle and neighboring structures.

Required Reading:

- Gitlin's dissector of the human brain

- The Human Nervous System, Kiernan, J.A. Lippincott-Raven

- Anatomy Atlas (Netter/Sobota/Other

Additional Reading Material:

- Essentials of Neural Science and Behavior, Kandel, E., Schwartz, J.H., Jessel, T.M. Appelton & Lang

- From Neuron to Brain, Nicholls, J., Martin, A.R., Wallace, B. Sinauer

- Neuroscience, Purves,D., Augustine, G.J., et al. Sinauer

Course/Module evaluation:

End of year written/oral examination 100 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 0 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

Additional information:

An examination (total of 100 marks) will be based on:

• Written multiple choice section – 60%

• Laboratory section where students are asked to identify brain structures - 40%