FUNCTIONAL NEUROANATOMY

GENERAL INFORMATION

Course coordinator	Professor Marija Heffer, MD, PhD
Assistant/Associate	Assistant Professor Božo Muršić, MD, PhD Assistant Professor Tamer Salha, MD, PhD
Study Programme	Integrated undergraduate and graduate university study of Medicine
Status of the course	Elective
Year of study, semester	2nd year, 2nd semester
ECTS	**2**
Workload (hours)	Lectures (5); Seminars (10); Exercises (10)
Expected number of students	30

COURSE DESCRIPTION

Course objectives

Connect knowledge of neuroanatomy and neurophysiology with clinical application through interpretation and differential diagnosis of clinical cases (trauma, inflammation, hemorrhage, ischemic lesion, tumor, neurodegeneration) and associated brain imaging (X-ray, CT, MR, fMRI, DTI).

Enrolment requirements and entry competencies

Completed course Fundamentals of Neuroscience

Learning outcomes at the Programme level

1.1., 3.5

Learning outcomes (5-10)

After listening to lectures, seminars and exercises, independent learning and passing the exam, students will be able to:

1. Recognize the main anatomical structures of the central nervous system and distinguish them from pathological processes (bleeding, tumor, trauma, inflammation, ischemia, aneurysm) in different imaging, distinguish individual imaging techniques and critically explain their applicability on basic neurological conditions and neurosurgical practice ;

2. Describe the pathophysiological sequence of events and argue the possibilities of imaging diagnostics and therapeutic intervention with regard to the elapsed time since trauma and ischemic or hemorrhagic stroke;

3. On the example of long pathways through the spinal cord, visual and auditory pathways, select appropriate imaging techniques and neurological tests to assess the level of the lesion and demonstrate the taking of neurological status;

4. Recognize emergency neurological conditions in which differential diagnosis is achieved by imaging and select the correct algorithm;

5. Distinguish brain imaging representations of neurodegenerative diseases (Alzheimer's disease, frontotemporal dementia, Parkinson's, Huntington's).

Course content

Lectures

Brain imaging (CT, MR, fMRI, DTI…). Recognition of pathological processes on CT and MR. Brain trauma imaging. Emergency neurological conditions and brain imaging. Differential diagnostics of neurodegeneration by brain imaging.

Seminars

External and internal anatomy of the brain on preparations and brain imaging. Ascending and

descending pathways of the spinal cord - consequences of lesions. Pathophysiology of ischemic and hemorrhagic stroke. Visual field as a diagnostic marker of intracranial processes. Identification of pathology within the auditory tract.

Exercises

The cerebrovascular system - recognition of stenosis, aneurysms and angiomas. The structure of the meninges and the principles of cerebrospinal fluid circulation on the example of a section of the lamb's brain. Eye section and visual pathway preparation. Neurological tests of cranial nerves. Neurological tests of motor skills and sensory perception.

Mode of teaching

Lectures; Seminars; Exercises

Student obligations

Attendance at all forms of classes is mandatory, and the student must access all knowledge tests. A student may justifiably miss 30% of each form of instruction. Unfinished exercise must be colloquial.

Monitoring student work *(alignment of learning outcomes, teaching methods and grading)*

Teaching activity	ECTS	Learning outcome	Student activity	Assessment methods	Grade points	
					Min.	Max.
Class attendance	0,5	1-5	Class presence	Record	5	20
Exercises	0,5	3	Mastering the skill of taking neurological status	Exercise diary	15	30
Final exam	1,0	1-5	Learning for the oral exam	Oral exam	30	50
Total	**2**				**50**	**100**

Evaluation of final exam:

Student answer	Grade points
The answer meets the minimum criteria	30.0
The average answer with noticeable errors	37.0
The very good answer with minor errors	44.0
The exceptional answer	50.0

Calculation od final grade:

Students who achieved 30 or more points in the final exam, the points obtained in the final exam are added to the grade points obtained during the class, and this sum constitutes the final grade. Since the study program schedule descriptive assessment of elective courses, the course

coordinator awards the grade "passed" to a student who achieves 50 or more grade points in the course.

Required reading (available in the library and through other media)		
Title	Number of copies in the library	Availability through other media
Accompanying materials to lectures, seminars and exercises - Script		On line, Merlin

Additional reading
Duane E. Haines: Neuroanatomy in Clinical Context – An Atlas of Structures, Sections, Systems, and Syndromes, Lippincott Raven, 2018. Zoran Rumbolt et al. Brain Imaging with MRI and CT - An Image Pattern Approach, Cambridge University Press, 2012.

Course evaluation procedures
Anonymous, quantitative, standardized student survey on the subject and work of teachers conducted by the Office for Quality of the Medical Faculty Osijek.

Note /Other
E-learning is not included in the norm of subject hours, but it is used in teaching and contains links to various pages, video and audio materials available on the website.