

<b>FUNCTIONAL AND DYNAMIC SEGMENT OF THE SPINE</b>	
<b>GENERAL INFORMATION</b>	
Course coordinator	Asst. Prof. Tamer Salha, MD, PhD
Assistant/Associate	Zdravka Krivdić Dupan, MD Silva Guljaš, MD
Study Programme	Integrated undergraduate and graduate university study of Medicine
Status of the course	Elective
Year of study, semester	4th year, 8th semester
ECTS	<b>2</b>
Workload (hours)	Seminars (25)
Expected number of students	30
<b>COURSE DESCRIPTION</b>	
<b>Course objectives</b>	
Learn the basics of the radiological anatomy of the vertebral canal and paravertebral structures, the basics of devices for conventional radiography, computer tomography (CT), magnetic resonance (MR), as well as the advantages and disadvantages of certain examination techniques in the diagnostic processing of the spine. Analysis of the findings obtained by the mentioned imaging modalities in order to identify normal anatomical structures, congenital, pathological or traumatic changes of the vertebral dynamic segment, as well as their influence on the symptomatology of neurological and neurosurgical patients.	
<b>Enrolment requirements and entry competencies</b>	
Attended Radiology subject	
<b>Learning outcomes at the Programme level</b>	
<b>1.2.,2.1.,3.1.</b>	
<b>Learning outcomes (5-10)</b>	
After completing the seminars, independent study and passing the exam, students will be able to: <ol style="list-style-type: none"> <li>1. Argue the possibilities and limitations of devices for conventional radiography, computer tomography, magnetic resonance in the diagnostic treatment of the spine.</li> <li>2. Critically evaluate the choice of imaging modality depending on symptomatology and clinical inquiry</li> <li>3. Evaluate and differentiate anatomical and physiological changes from pathological changes on different imaging modalities</li> <li>4. Independently analyze radiological findings</li> <li>5. Independently compare the radiological findings with the clinical symptoms of neurological or neurosurgical patients and draw a conclusion</li> <li>6. Independently measure the AP and the transverse diameter of the spinal canal in the cervical, thoracic and lumbar segments</li> <li>7. Independently recognize the most common disk pathology</li> </ol>	
<b>Course content</b>	
<b>Seminars:</b> Observation of anatomical structures (paravertebral structures and structures in the spinal canal) - standard images, functional images - analysis; Measurement of AP and transverse diameter of the spinal canal - differences in the cervical, thoracic and lumbar segments; Dynamic segment of the spine on the myelogram - observation of nerve roots and lateral recess as a morphological entity; CT and MR processing of the spine - similarities and differences; Intervertebral disc-disc pathology and analysis of the L/S area-the most frequently observed disc pathology	
<b>Mode of teaching</b>	

Seminars

**Student obligations**

Attending all forms of classes is mandatory, and the student must pass all knowledge tests. A student can excuse himself from 30% of each form of teaching. Undone exercise must be graded.

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

Teaching activity	ECTS	Learning outcome	Student activity	Assessment methods	Grade points	
					Min.	Max.
Attending classes	0,5	1-5	Attendance at classes	Record	5	20
Seminars	0,5	1-5	Attendance and active participation in seminars	Presentation	15	30
Final exam	1,0	1-5	Studying for the oral exam	Oral exam	30	50
<b>Total</b>	<b>2</b>				<b>50</b>	<b>100</b>

*Calculation of 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
<ol style="list-style-type: none"> <li>1. Marušić A, Krmpotić-Nemanić J: Anatomija čovjeka, Medicinska naklada , Zagreb 2004.</li> <li>2. Aumüller G, Aust G, Conrad A, Engele J, Kirsch J, Maio G, Zilch HG. (ur. hrv. izdanja: Katavić V, Petanjek Z, Vinter I): Duale Reihe Anatomija, Medicinska naklada, Zagreb, 2018.</li> <li>3. Hebrang A, Klarić – Čustović R. i suradnici. Radiologija, udžbenik, 3. dopunjeno i obnovljeno izdanje, Zagreb, Medicinska naklada, 2007</li> <li>4. Bešenski N, Janković S: Klinička neuroradiologija kralježnice i kralježnične moždine. Zagreb, Medicinska naklada,2013.</li> <li>5. Eterović D, Janković S: Fizikalne osnove i klinički aspekti medicinske dijagnostike. Zagreb,, Medicinska naklada, 2002.</li> <li>6. Fučkan I: Magnetska rezonancija, priprema i planiranje pregleda. Zagreb, Tko zna zna doo.,2012.</li> </ol>	10	

**Additional reading**

1. Deller, T, Sebestény, T: Fotografski atlas neuroanatomije, Medicinska naklada Zagreb, Zagreb 2015.
2. Josip Stojanović: "Trzajna ozljeda vratne kralježnice - riješena enigma", Naklada Ljevak Zagreb 2006.
3. Osborn AG, Ross JS, Moore KR, Anderson JF: Imaging anatomy brain and spine, Elseviere, Philadelphia 2020.

**Course evaluation procedures**

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.

**Note /Other**

E-učenje ne ulazi u norma sate predmeta, ali se koristi u nastavi i sadrži poveznice na različite stranice, video i audio materijale dostupne na mrežnim stranicama.