GENERAL INFORMATION

Course name	Radiology				
Course director	Prof. Zvonimir Sučić, MD, PhD				
Assistants	Asst. Prof. Otmar Rubin, MD, PhD				
	Asst. Prof. Tamer Salha, MD, PhD				
Study program	Integrated undergraduate and graduate university study				
	program Medical Studies in German				
Course status	Mandatory				
Year of study, semester	4 th year, 8 th semester				
Credits allocated and form of instruction	ECTS student workload	6			
	Number of teaching hours	75 (25+15+35)			
	(L+S+E)				

COURSE DESCRIPTION

Course objectives

The course will familiarize the medical student with the basics of applying ionizing radiation using conventional X-ray machines and CT, as well as the principles of ultrasound imaging and magnetic resonance imaging in diagnostic radiology and interventional radiology. The focus is on understanding the imaging methods of organs and organ systems, radiological pathology and symptomatology in relation to pathohistological findings, based on previously acquired clinical knowledge and skills. The units will be covered by students through lectures, seminars and exercises in the following order: Introduction – general radiology; CT, MSCT, MSCTA, MRI and MRA – physical principles; Thoracic organs; Osteoarticular system; Hepatobiliary and urogenital system; Gastrointestinal system; Vascular system and interventional radiology; Neuroradiology USG – imaging, physical principles; USG, Doppler, physical principles.

Course requirements

There are no specific requirements for this course except those defined in the study program curriculum.

Learning outcomes relevant to the study program

1.1, 2.1, 2.3, 3.1, 3.2, 4.2

Expected learning outcomes (5-10 learning outcomes)

Knowledge

- 1. Describe the essential devices used in diagnostic radiology and explain the operating principles of X-ray imaging devices, ultrasound and magnetic resonance imaging
- 2. Explain the biological effect of ionizing radiation and radiation protection procedures
- 3. Define fundamental radiological diagnostic procedures and the area of their application on certain tissues, organs, organ systems and body parts
- 4. Choose and apply the appropriate diagnostic procedure in accordance with the clinical picture and diagnosis
- 5. List contrast agents and describe possible side effects of X-ray contrast agents and contrast agents for magnetic resonance imaging
- 6. Explain the connection of radiologically visible pathological-anatomical changes with the clinical picture
- 7. Define interventional radiology procedures
- 8. Define the importance of joint work of the doctor who manages the patient, the radiologist and the pathologist in an interdisciplinary and multidisciplinary diagnostic and therapeutic team

Skills

1. Recognize anator	mical	and	pathologica	l stru	uctures	on	radiological	images		
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2. Isolate a pathologic			• •					lological		
signal on different magnetic resonance imaging (MRI) sequences										
3. Estimate the radiation boundary between the pathological change and the surrounding								ounding		
healthy tissue and the characteristics of the edges of the lesion										
4. Demonstrate radiological changes after surgical intervention and the progression or										
	regression of the lesion after the radiological and/or chemotherapy procedure									
5. Observe typical radiological signs in acute conditions (such as acute abdomen)										
6. Adequately prepare the patient for the diagnostic or therapeutic procedure										
Course content										
General radiology, history of development of radiology, X-ray tube, grid, foils, cassette										
Radiation protection of the patient and healthcare practitioners. CT, MSCT, MSCTA, MRI and										
MRA physical principles of operation of MSCT and MRI. MSCT and MRI angiography.										
Perfusion, diffusion, gradient techniques. Thoracic organs. Anatomy, pathophysiology										
Specific and non-specific pneumonia. Pneumothorax, tumors, liquidothorax										
Osteoarticular system. Trauma, fractures, inflammations, tumors, soft tissue pathology. MRI										
and MSCT as a diagnos										
diagnostics. MRCP. USG										
Gastrointestinal system. E										
fistulography. Vascular sy		and int				SA, N				
	and		contrai					adiology;		
ischemic and hemorrhagic stroke, tumors, extra-axial haemorrhage, brain and spine trauma,										
herniated disk, demyelination. USG – imaging, physical principles. Development of diagnostic										
ultrasound, ultrasound imaging of the abdomen, urinary tract, breasts, joints and muscles.										
USG, Doppler, physical principles. VB system, carotid system, peripheral arteries, diagnostics										
of venous thrombosis										
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Additional reading

The number of copies of mandatory reading in proportion to the number of students						
currently taking this course						
Title	Number of copies Number of students					
Reiser M, Kuhn FP, Debus J. Radiologie - Duale Reihe. Thieme; 2017	A purchased license for online textbooks shall be used <u>https://bfdproxy48.bfd-</u> <u>online.de/login.htm?back=http%3a%2f%2fpartner.bfd-</u> <u>online.info.bfdproxy48.bfd-</u> <u>online.de%2fameos%2fbfdAboGateway%3fabold%3d2641</u> <u>17</u> Access will be granted to all students enrolled in the study program					
Quality monitoring methods ensuring the acquisition of knowledge upon completion, skills and competences						

The quality of course performance is monitored through an anonymous student survey on the quality of the organization and conduction of classes, the course content and the work of professors. The usefulness of the lectures from the students' perspective, the curriculum content, the professor preparedness, the clarity of the presentation, the amount of new content and the quality of the presentation are evaluated. The curriculum and its execution are administratively compared. The participation of students in lectures and exercises, as well as the excuses for missing classes, are controlled and analyzed.