

Program	Level of studies		Second cycle	
	Program name		Physics	
Course name	RADIOLOGICAL IMAGING			
Course ID	Semester	Course status	ECTS credits	L+E
PAP9661	II	ELECTIVE	6	3+2
Lecturer	Doc. dr. Adnan Beganović			
Aims and intended learning outcomes	Objective: To give students detailed theoretical and practical knowledge of medical imaging in diagnostic radiology and nuclear medicine. Outcomes: ovladati i razumjeti moderne metode i slikovnih tehnika u medicini.			
Course content				
<p>1. Introduction: The basic concept of imaging methods in radiology; Image quality; Spatial resolution, Convolution; Contrast; Noise; Contrast-to-noise ratio; Signal-to-noise ratio; IT systems; Digital radiological images; PACS and teleradiology; Image processing.</p> <p>2. Imaging methods in diagnostic radiology: X-ray production; X-ray tubes; X-ray generators; Radiography; Geometry of projection radiography; Screen-film radiography; Computed radiography; CCD and CMOS detectors; FP detectors; Technique factors in radiography; Scintillators and intensifying screens; Exposure index; Dual-energy radiography; Scattered radiation in projection radiography; Mammography; Quality of x-rays in mammography; Compression, scattered radiation and magnification in mammography; Film and film processing; Digital mammography; Fluoroscopy; Detector systems in fluoroscopy; Image quality in fluoroscopy; Computed tomography; CT design; Image reconstruction; Image quality in CT; Magnetic resonance imaging; Ultrasound.</p> <p>3. Imaging methods in nuclear medicine: Radioactivity; Production of radionuclides and radiopharmaceuticals; Radiation detection and measurement; Gas detectors; Scintillation detectors; Semiconductor detectors; Spectroscopy; Scintillation camera; Emission tomography; Single Photon Emission Tomography; Positron emission tomography; Hybrid systems.</p>				
Student workload (hours)		Grading		
Lectures and Exercises	75	Assessment method	Points	
Exam preparation	65	Midterm	45	
Other	10	Final	45	
Total	150	Activity	10	
		Total	100	
Literature				
<p>1. Dance DR, Christofides S, Maidment ADA, McLean ID, Ng KH, editors. Diagnostic Radiology Physics: A Handbook for Teachers and Students. Vienna, Austria: IAEA; 2014.</p> <p>2. Bailey DL, Humm JL, Todd-Pokropek A, van Aswegen A, editors. Nuclear Medicine Physics: A Handbook for Teachers and Students. Vienna, Austria: IAEA; 2014.</p> <p>3. Bushberg JT, Boone JM. The essential physics of medical imaging. Philadelphia: Lippincott Williams & Wilkins; 2011.</p>				
Remarks				
Exercises are performed at the Clinical Centre of Sarajevo University.				