Program	Level of studies		Second cycle	
	Program name		Physics	
Course name	PHYSICS IN DIAGNOSTIC RADIOLOGY			
Course ID	Semester	Course status	ECTS credits	L+E
PAP9611	II	ELECTIVE	6	2+2
Lecturer	Doc. dr. Adnan Beganović			
Aims and intended learning outcomes	Aim: to provide students with detailed theoretical and practical knowledge of physics in modern diagnostic radiology and to prepare students for independent work as medical physicists. Outcomes: master and understand the modern methods and techniques used in clinical diagnostic radiology and apply them in everyday medical practice			

Course content

1. Physics in Diagnostic Radiology: Introduction; The Physical Basis of Diagnostic Radiology and Terminology; Exercises.
2. X-ray radiation devices in diagnostic radiology: Conventional X-ray tube; Source of electrons; Rectifiers; Structure of anodes and cathode; Diagnostic X-ray characteristics; X-radiation spectra; Interaction of anode electrons; Characteristic radiation; Bremsstrahlung; Angular distribution of x-rays; Large and small focus; Exercises.
3. Detectors in diagnostic radiology: X-ray film; Silver bromide; Exposure to x-radiation; Developing the film and effects in the film caused by the interaction with the developer; X-ray film features; Optical density; H-D curve; Intensifiers and Fluorescent Screens: Fluorescence Mechanism; Electronic traps; Luminescent materials; Grid; Screens; Screen thickness; Display production materials; Sharpness of the picture; Improper images; Fluoroscopic screens; Digital detectors; Computed Radiography and Direct Digital Radiography; Exercises.
4. Diagnostic radiology modalities: Radiography; Patient dosimetry in radiography; Skin entrance dose; Radiation output; Fluoroscopy; Patient dosimetry in fluoroscopy; Air KERMA–area product; Tomography; Computed tomography; Patient dosimetry in computed tomography; Computed tomography Air KERMA index; Mammography; Patient dosimetry in mammography; Mean glandular dose; Digital subtraction angiography; Ultrasound; Nuclear magnetic resonance; Spectroscopy in Magnetic Resonance; Exercises.
5; Image viewing devices: Monitors in diagnostic radiology; Lightboxes.

Student workload (hours)		Grading	
Lectures and Exercises	60	Assessment method	Points
Exam preparation	80	Midterm	45
Other	10	Final	45
Total	150	Activity	10
		Total	100

Literature

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.
2. Pdgoršak EB, editor. Review of Radiation Oncology Physics: A Handbook for Teachers and Students. Vienna, Austria: IAEA; 2005.
3. Bailey DL, Humm JL, Todd-Pokropek A, van Aswegen A, editors. Nuclear Medicine Physics: A Handbook for Teachers and Students. Vienna, Austria: IAEA; 2014.
4. Johns HE, Cunningham JR. The Physics of Radiology. 4th ed. Springfield, IL: Charles C Thomas; 1983.

Remarks

Exercises are performed at the Clinical Centre of Sarajevo University.