

	UNIVERSITY OF EAST SARAJEVO Faculty of Medicine							
	Study program: medicine							
	Integrated academic studies			III study year				
Full subject title		RADIOLOGY AND NUCLEAR MEDICINE						
Department		Department of Propedeutics, Faculty of Medicine in Foča						
Subject code		Subject status			Semester		ECTS	
ME-02-1-028-6		compulsory			VI		8	
Professor/ -s		Full professor Vera Artiko MD, PhD; Full professor Biljana Marković-Vasiljković MD, PhD; assistant professor Nataša Prvulović-Bunović, MD, PhD; assistant professor Jasmina Bajrović, MD, PhD; assistant professor Vedran Markotić, MD, PhD; assistant professor Jelena Maric						
Associate/ -s								
Number of lectures/ teaching workload (per week)				Individual student workload (in hours per semester)			Coefficient of student workload $S_0$¹	
L	E	SP	L	E	SP	L		
4	3	0	4*15*1.3	3*15*1.3	0*15*1.3	1,3		
total teaching workload (in hours, per semester) 4*15+3*15+0*15=105				total teaching workload (in hours, per semester) 4*15*1.3+3*15*1.3+0*15*1.3=135				
Total subject workload (teaching + student): 105+135= 240 hours								
Learning outcomes		<p>Student will be introduced to the spectrum of imaging methods, their basic principles and utilization, and should gain knowledge about all diagnostic imaging modalities (x-ray diagnosis, echotomography, computerized tomography, magnetic resonance imaging, invasive diagnostic methods), as well as the basic principles of minimal invasive therapy – interventional radiology methods. Particular attention is paid to accurate indications and becoming accustomed with the diagnostic options of particular categories of radiological examination. Upon completion of the course, students will be able to select properly most appropriate radiological methods for particular clinical situations and to analyze radiography images, echotomograms, computed tomography and MR images in order to recognize the principal signs of most common diseases in these main imaging modalities. Student will be able to establish the diagnosis based on obtained diagnostic data and understand radiological findings.</p> <p>Also, students will be to appropriately inform the patients about interventional radiology methods.</p> <p>Detailed knowledge of the anatomical details in each diagnostic modality will be required.</p>						
General competences		<p>They possess broad fundamentals of theoretical knowledge and practical skills, preparing them for any type of postgraduate education as well as for collaboration with other medical professionals.</p> <p>They have adopted attitudes concerning medical ethics.</p> <p>They are prepared for further development and advances within the field of medicine.</p> <p>They have acquired a systemic thinking approach as well as a structured approach to medical problems during their education.</p> <p>They fulfill the legal requirements for a career in the field of medicine and are eager to accept responsibility associated with medical knowledge concerning additional professional education.</p> <p>They are acquainted with a specific diagnostic algorithm.</p> <p>They are capable of making appropriate therapeutic decisions.</p> <p>They advocate for the patient's right to participate fully in medical treatment decisions, including the right to the refusal of care or participation in the process of education and scientific research.</p> <p>They are capable of expressing themselves and communicating in a manner that is both understandable and acceptable to the patient.</p> <p>They are prepared for accepting responsibility and appropriate medical decision-making.</p> <p>They are acquainted with health improvement and disease prevention and are eager to make medical professionals adopt more positive attitude towards it.</p> <p>They are conscious of the necessity for continuous learning and improvement process to maintain a high level of medical competence.</p>						

¹The coefficient of student workload S_0 is calculated as it follows:

a) for the study programs not going through the licensing process: $S_0 = (\text{total workload in semester for all of the subjects } 900 \text{ hrs} - \text{total teaching workload } L+E \text{ in semester for all of the subjects } 870 \text{ hrs}) / \text{total teaching workload } L+E \text{ in semester for all of the subjects } \text{ hrs} = \text{ }.$ Consult form content and its explanation.

b) for the study programs going through the licensing process, it is necessary to use form content and its explanation.

Preconditions	Required previously passed exams: pathology and pathological physiology		
Teaching methods	<p>Theoretical teaching: lectures, slide and video-clip aided; Practical instruction: analysis of x-rays and images obtained at echotomography, CT and MRI; attendance at ultrasound and CT/MRI examinations, real time and video demonstrations of interventional radiology methods; Seminars: Seminar topics are defined at the beginning of classes and refer to the content of practical instruction. Consultations: regularly during the school year; Pre-exam practice: for each exam term and for all groups of students.</p>		
Subject content per week	<p>LECTURES</p> <p>1. Basics of medical application of ionizing radiation; physics of imaging methods (X-ray, ultrasound, computed tomography, magnetic resonance imaging); radiology networks and exchange of information;</p> <p>2. Radiology devices and principles of their work (x-ray machine, ultrasound, computed tomography machine, magnetic resonance machine); application and indications for radiological examinations (X-ray, computed tomography, ultrasound, magnetic resonance imaging);</p> <p>3. Contrast media (introduction to the contrast media used during radiological examinations; acquaintance with side effects and measures of prevention and treatment of side effects of contrast agents; introduction to endographic methods in radiology);</p> <p>4. Basic principles and indications for invasive diagnostic and intervention-radiology methods: arteriography, percutaneous examination methods/biopsies, interventional radiology methods (angioplasty, balloon dilatation, stents, percutaneous drainage, intraarterial injections, endovascular treatment of intracranial aneurisms- embolization of blood vessels).</p> <p>5. Radiological characteristics of common disorders of respiratory system and mediastinum;</p> <p>6. Radiological characteristics of common disorders of cardio-vascular system;</p> <p>7. Radiological characteristics of common disorders of digestive system and acute abdomen;</p> <p>8. Radiological characteristics of common disorders of urinary system;</p> <p>9. Radiological characteristics of common disorders of reproductive system (breast, female pelvis and male reproductive organs: prostate and scrotum);</p> <p>10. Radiological characteristics of common disorders of musculoskeletal system;</p> <p>11. Radiological characteristics of common disorders of nervous system.</p> <p>Exercises:</p> <p>1. Demonstration of radiology-imaging equipment and instruments and their operations;</p> <p>2. Radiology of lungs and mediastinum (Interpretation of the examination of the pathology of the respiratory system and mediastinal structures)</p> <p>3. Radiology of cardiovascular system (Interpretation of the examination of the pathology of the cardiovascular system)</p> <p>4. Radiology of digestive system (Interpretation of the examination of the pathology of the digestive system)</p> <p>5. Radiology of urinary system (Interpretation of the examination of the pathology of the urinary system);</p> <p>6. Radiology of reproductive system (Interpretation of the examination of the pathology of the female and male reproductive system: breast, acute scrotum);</p> <p>7. Radiological characteristics of common disorders of musculoskeletal system (Interpretation of the examination of the pathology of the bone-joint system);</p> <p>8. Radiological characteristics of common disorders of nervous system (Interpretation of the examination of the pathology of the nervous system);.</p> <p>9. Interventional radiology (demonstration of particular interventional radiology techniques: therapeutic non vascular procedures, therapeutic and diagnostic vascular procedures)</p>		
Compulsory literature			
Author/s	Publication title/ Publisher	Year	Pages (from-to)
Gunderman R	Essential Radiology, 2 nd ed. Thieme	2006	
Richard B. Gunderman	Essential Radiology: Clinical Presentation, Pathophysiology, Imaging. Thieme.	2014.	
William Herring	Learning Radiology: Recognizing the Basics, 3e. Elsevier	2015.	

	Science		
Lothar Wicke	Atlas of Radiologic Anatomy. Saunders	2004.	
Milošević N, Platiša M, Žikić D, Rajković N.	Biophysics in Radiology and Nuclear Medicine. Libri Medicorum. University of Belgrade, School of Medicine	2016.	
Sharp PF, Gemmell HG, Murray AD.	Practical nuclear medicine. Springer London	2005.	
Additional literature			
Author/s	Author/s	Author/s	Author/s
Student responsibilities, types of student assessment and grading	Grading policy		Points
	Pre-exam activities		Percentage
	lecture/exercise attendance		30
	Positively evaluated seminar paper		20
	Final exam		
	Practical exam		20
	Written exam		30
	TOTAL		100
Certification date	June 17th 2024		