



## Subject card

Subject name and code	Medical imaging laboratory, PG_00053368						
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering						
Date of commencement of studies	February 2024		Academic year of realisation of subject		2024/2025		
Education level	second-cycle studies		Subject group		Obligatory subject group in the field of study Optional subject group		
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Institute of Physics and Applied Computer Science -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Brygida Mielewska				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	15.0	0.0	0.0	15
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	15		8.0		27.0	50
Subject objectives	he aim of the course is to familiarize students with imaging tests. During classes, students will have the opportunity to learn the basics of computer tomography and magnetic resonance image acquisition, their recording format and display methods. Then they will be able to perform the phantom examination themselves on scanners and human examination on an MRI simulator. Finally, students learn about the possibilities basic image analysis.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W05] Knows and understands, to an increased extent, methods of process and function support, specific to the field of study.		The student understands research methods pictorial and basics CT and MRI image acquisition		[SW3] Assessment of knowledge contained in written work and projects		
	[K7_U05] can plan and conduct experiments related to the field of study, including computer simulations and measurements; interpret obtained results and draw conclusions		The student is able to plan phantom examination alone on scanners and human examination on MR simulator		[SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task		
	[K7_U02] can perform tasks related to the field of study as well as formulate and solve problems applying recent knowledge of physics and other areas of science		The student is able to perform the test phantom isolated on scanners and human examination on MR simulator		[SU2] Assessment of ability to analyse information		
Subject contents	1. Introduction to the basics of imaging. 2. Recalling the physical basis of radiological imaging using CT and MRI techniques 3. Presentation of the latest trends in radiology 4. Learning the rules of work safety in the MRI and CT laboratory 5. Phantom measurements using an MR device 6. Phantom measurements using a CT scanner 7. Working on medical consoles: learning the basic functions of the DICOMviewer software 8. Introduction to basic MR imaging acquisition parameters 9. Image acquisition on an MRI simulator 10. Analysis of images taken during classes at the UCK						
Prerequisites and co-requisites	Basic knowledge of the principles of operation of computed tomography and magnetic resonance imaging devices						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	project		60.0%		50.0%		
	attendance at classes		90.0%		50.0%		

Recommended reading	Basic literature	1) D.R. Dance Diagnostic Radiology Physics A Handbook for Teachers and Students, <a href="https://www-pub.iaea.org/mtcd/publications/pdf/pub1564webnew-74666420.pdf">https://www-pub.iaea.org/mtcd/publications/pdf/pub1564webnew-74666420.pdf</a> 2) <a href="https://brain.fuw.edu.pl/edu/index.php/Obrazowanie_Medyczne">https://brain.fuw.edu.pl/edu/index.php/Obrazowanie_Medyczne</a> 3) From picture to proton Donald W. McRobbie, Elizabeth A. Moore, Martin R. Prince, Martin J. Graves
	Supplementary literature	---
	eResources addresses	Podstawowe <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=39957">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=39957</a> - eNauczanie course Adresy na platformie eNauczanie: Pracownia Obrazowania Medycznego 2024/25 kopia 1 - Moodle ID: 42414 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=42414">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=42414</a>
Example issues/ example questions/ tasks being completed	1. Phantom measurements using a CT scanner  2. Image acquisition on an MRI simulator	
Work placement	Not applicable	

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