GDAŃSK UNIVERSITY OF TECHNOLOGY

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 2025	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	Obligatory subject group in the field of study Optional subject group Specialty 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	The aim of the course is to familiarize students with imaging examinations. During the course, students will have the opportunity to learn the basics of the acquisition of computed tomography and magnetic resonance images, the format of their recording and display methods. Then they will be able to perform a phantom examination on their own on scanners and a human examination on an MRI simulator. At the end, students learn about basic image analysis.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[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	student is able to perform the phantom examination independently on scanners and the human examination on the MR simulator	[SU2] Assessment of ability to analyse information
	[K7_W10] knows and understands, to an increased extent, the basic processes occurring in the life cycle of equipment, objects and technical systems, as well as methods of supporting processes and functions, specific to the field of study	Student is acquainted with imaging methods and basics data acquisition in CT and MR	[SW3] Assessment of knowledge contained in written work and projects
	[K7_U12] is able, to an increased extent, to analyze the operation of components and systems related to the field of study, as well as to measure their parameters and study their technical characteristics, and to plan and carry out experiments related to the field of study, including computer simulations, interpret the obtained results and draw conclusions	student is able to plan the phantom examination on scanners and the human examination on the MR simulator	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools

Subject contents	1. Introduction to the basics of imaging. 2. Review of physical basics of radiological imaging using CT and MR techniques 3. Presentation of the latest trends in radiology 4. Getting to know the rules of work safety in the MR and CT Unit 5. Phantom measurements using MR scanner 6. Phantom measurements using a CT scanner 7. Working on radiological consoles: getting to know the basic functions of DICOMviewer software 8. Introduction to the basic parameters of MR imaging acquisition 9. Image acquisition on the MRI simulator 10. Analysis of images taken during classes at the UCK
Prerequisites and co-requisites	Basic knowledge of the principles of computed tomography and magnetic resonance imaging

Assessment methods and criteria			
	Subject passing criteria	Passing threshold	Percentage of the final grade
	project	60.0%	50.0%
	attendance	90.0%	50.0%

Recommended reading	Basic literature	1) Radiologia. Diagnostyka obrazowa RTG, TK, USG i MR. Redaktor naukowy:Bogdan Pruszyński, Andrzej Cieszanowski, Wydawnictwo Lekarskie PZWL 2015 2) https://brain.fuw.edu.pl/edu/index.php/Obrazowanie_Medyczne 3) From picture to proton Donald W. McRobbie, Elizabeth A. Moore, Martin R. Prince, Martin J. Graves
	Supplementary literature	--
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	1. Phantom measurements using a CT scanner 2. Image acquisition on the MRI simulator
Work placement	Not applicable

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