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 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, https://www-pub.iaea.org/mtcd/publications/pdf/pub1564webnew-74666420.pdf2) https://brain.fuw.edu.pl/edu/index.php/Obrazowanie_Medyczne3) From picture to proton Donald W. McRobbie, Elizabeth A. Moore,Martin R. Prince, Martin J. Graves
	Supplementary literature	---
	eResources addresses	Podstawowe https://enauczanie.pg.edu.pl/moodle/course/view.php?id=39957 - eNauczanie course Adresy na platformie eNauczanie: Pracownia Obrazowania Medycznego 2024/25 kopia 1 - Moodle ID: 42414 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=42414
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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