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 2023	Academic year of realisation of subject	2023/2024
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 polish
Semester of study	2	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Mathematics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Brygida Mielewska	
	Teachers	dr Brygida Mielewska	

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_U05] can plan and conduct experiments related to the field of study, including computer simulations and measurements; interpret obtained results and draw conclusions	student is able to plan the phantom examination on scanners and the human examination on the MR simulator	[SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task
[K7_W05] Knows and understands, to an increased extent, methods of process and function support, 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_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

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
	attendance	90.0%	50.0%
	project	60.0%	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: Pracownia Obrazowania Medycznego 2022/23 - Nowy - Moodle ID: 30704 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30704	
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		