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	October 2023	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	2	Language of instruction	Polish
Semester of study	3	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_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_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

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

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>project</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>attendance</td><td>90.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>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</td></tr>
<tr><td>Supplementary literature</td><td>--</td></tr>
<tr><td>eResources addresses</td><td>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</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">1. Phantom measurements using a CT scanner
2. Image acquisition on the MRI simulator</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
</table>

Document generated electronically. Does not require a seal or signature.