University of Gdańsk

Subject card

Subject name and code	Signal Analysis and Visualization, PG_00182191		
Field of study	Medical Physics		
Date of commencement of studies	October 2027	Academic year of realisation of subject	2027/2028
Education level	Master's studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study
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	5.0
Learning profile	academic	Assessment form	exam
Conducting unit	Faculty of Mathematics, Physics and Informatics -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Marek Krośnicki	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	30.0	0.0	0.0	60

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	60	0.0	65.0	125

Subject objectives

not applicable

Learning outcomes

Course outcome	Subject outcome	Method of verification
[FIZMEDMU2_U02] Can plan and conduct an experiment using new or adapt existing methods and tools, and critically analyse the results of measurements, observations or numerical calculations, assessing the accuracy of the results using known methods and tools.	The student is able to design and conduct analysis of biological and medical signals using machine learning methods and image segmentation techniques, and perform a critical evaluation of the obtained results.	[SU2] presentation/project/paper/ report
[FIZMEDMU2_W05] Knows and understands in depth the theoretical foundations of computational methods and computer techniques used to model and simulate physical and biological systems.	The student has an in-depth knowledge and understanding of the theoretical foundations of computational methods and Machine Learning techniques applied to the analysis and processing of medical imaging data, including segmentation, filtering, and visualization methods.	[SW2] presentation/project/paper/ report
[FIZMEDMU2_W02] Knows and understands in depth the issues of mathematics and mathematical methods used in physics and medicine, as well as the relationships between them.	The student has an in-depth knowledge and understanding of mathematical concepts and methods applied in the analysis and visualization of medical signals, including machine learning methods.	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report

Subject contents

not applicable

Prerequisites and co-requisites

not applicable

<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>Completion and presentation of 3 projects</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1) Ch. Solomon, T. Breckon "Fundamentals of Digital Image Processing", Willey-Blackwell 2011

2) G. James, D. Witten, T. Hastie, R. Tibshirani, J. Taylor, An Introduction to Statistical Learning, https://www.statlearning.com/

3 J, L. Semmlow, Bioisignal and Biomedical Image Processing Marcel Dekker INC 2004</td></tr>
<tr><td>Supplementary literature</td><td>not applicable</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">not applicable</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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