GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Acquisition, collection and processing of biomedical data, PG_00053319		
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	second-cycle 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	2.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Biomedical Engineering -> Faculty of Electronics, Telecommunications and Informatics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Marcin Gruszecki	
	Teachers	mgr inż. Kamil Osiński dr hab. Marcin Gruszecki dr inż. Paweł Syty dr inż. Tomasz Kocejko dr inż. Patryk Jasik	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	0.0	0.0	30

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	30	3.0	17.0	50

Subject objectives

The main aim of the course is introduction the students to problems of acquisition, gathering and data processing of biomedical data.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W53] Knows and understands, to an increased extent, selected aspects of biomedical diagnostics.	Students are able to apply the acquired knowledge to the interpretation of the obtained results.	[SW1] Assessment of factual knowledge
[K7_U03] can design, according to required specifications, and make a complex device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	Students are able to apply theoretical knowledge to specific experiments or device design.	[SU1] Assessment of task fulfilment
[K7_W03] knows and understands, to an increased extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum	Students are able to apply theoretical knowledge to solve specific problems.	[SW1] Assessment of factual knowledge

Subject contents	Introduction Types of biomedical data (numerical data, signals, images) Sources and methods of obtaining biomedical data Purposes of collecting biomedical data Uncertainties and errors in the process of collecting biomedical data Quality of biomedical data Examples of biomedical data processing Obtaining consent to collect biomedical data (PG and GUMed ethics committee) Control of single variables and study of their distribution Study of the correlation between variables Data autoscaling and principal component analysis Building a population for biomedical research. Structures of different populations. Sources of biological material (e.g. blood, serum, fibroblasts). DNA, RNA, miRNA, fcDNA as a source of information about the patient. The methods of storing the material Examples of laboratory determinations, clinical data, molecular determinations. Processing and preparation of medical images (and other data) for machine learning purposes
Prerequisites and co-requisites	Basics of physics and programming

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
	60.0%	60.0%
	60.0%	40.0%

Recommended reading	Basic literature	R. Tadeusiewicz, Informatyka medyczna, Uniwersytet Marii Curie-Skłodowskiej w Lublinie, Lublin 2011 A. Gajewski, Błdy pomiarów, Akademia Ekonomiczna w Krakowie, Kraków 1996 A. Stanisz, Przystpny kurs statystyki z zastosowaniem STATISTICA PL na przykładach z medycyny, TOM I

	Supplementary literature	M. Michalski, W. Koba, T. Nieczkowski, Ł. Ryfa, Identyfikacja, analiza i klasyfikacja typów danych medycznych oraz okrelenie modeli ich gromadzenia i udostpniania na potrzeby leczenia oraz prowadzenia polityki ochrony zdrowia z uwzgldnieniem aspektów syntaktycznych i semantycznych oraz ilociowych tych danych w kontekcie dowiadczekrajowych i midzynarodowych, Centrum Systemów Informacyjnych Ochrony Zdrowia, 2010
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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