



Subject card

Subject name and code	Statistical analysis of biomedical data, PG_00053357							
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering							
Date of commencement of studies	October 2022	Academic year of realisation of subject			2023/2024			
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	2	Language of instruction			Polish			
Semester of study	3	ECTS credits			2.0			
Learning profile	general academic profile	Assessment form			assessment			
Conducting unit	Department of Biomedical Engineering -> Faculty of Electronics, Telecommunications and Informatics							
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Artur Poliński						
	Teachers	dr hab. Marcin Gruszecki dr inż. Artur Poliński						
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	Introduction to statistical analysis of biomedical data							
Learning outcomes	Course outcome		Subject outcome			Method of verification		
	[K7_W04] Knows and understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such devices		The student knows the basic distributions of random variables and the parameters describing them			[SW1] Assessment of factual knowledge		
[K7_W01] knows and understands, to an increased extent, mathematics to the extent necessary to formulate and solve complex issues related to the field of study		The student knows the basic types of statistical tests			[SW1] Assessment of factual knowledge			

Subject contents	<p>Introduction to statistics (what it does, defining a statistical survey, preparing a survey, collecting observations, types of statistical features, developing statistical material).</p> <p>Descriptive statistics (goals, measures of position, measures of variability, measures of asymmetry, examples).</p> <p>Distribution series (goals, used, relevant examples).</p> <p>Random variables (goals, the most important elements of the probability theory, random variables and their distributions - discrete and continuous, matching the distribution to the collected variables).</p> <p>Techniques of statistical inference (introduction, goals, estimation and estimators, verification of statistical hypotheses, tests for the mean, interpretation of results, examples).</p> <p>T-Student tests (introduction, goals, T-Student tests for unrelated and related variables, examples).</p> <p>Non-parametric tests (introduction, goals, comparison to parametric tests, examples).</p> <p>Analysis of variance (introduction, goals, examples).</p> <p>Basics of correlation and regression (goals, introductory concepts, partial correlations, nonparametric correlations, regression function, examples).</p> <p>Multi-way tables (goals, introductory concepts and analyzes, examples).</p> <p>An example of the application of statistical analyzes on the basis of a scientific publication: Gruszecki et al. Human subarachnoid space width oscillations in the resting state, 2018, Sci Rep</p>											
Prerequisites and co-requisites	knowledge of mathematical analysis											
Assessment methods and criteria	<table border="1" data-bbox="448 551 1487 656"> <thead> <tr> <th data-bbox="448 551 794 584">Subject passing criteria</th> <th data-bbox="794 551 1141 584">Passing threshold</th> <th data-bbox="1141 551 1487 584">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 584 794 618">laboratory</td> <td data-bbox="794 584 1141 618">51.0%</td> <td data-bbox="1141 584 1487 618">60.0%</td> </tr> <tr> <td data-bbox="448 618 794 656">lecture</td> <td data-bbox="794 618 1141 656">51.0%</td> <td data-bbox="1141 618 1487 656">40.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	laboratory	51.0%	60.0%	lecture	51.0%	40.0%
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Example issues/ example questions/ tasks being completed												
Work placement	Not applicable											