



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	February 2027	Academic year of realisation of subject				2027/2028	
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				assessment	
Conducting unit	Department of Biomedical Engineering -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Artur Poliński				
	Teachers		dr inż. Artur Poliński				
Lesson types	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 increased extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or other elements or programmable devices specific to the field of study, and organization of work 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_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, making assessment and critical analysis of the prepared software as well as a synthesis and creative interpretation of information presented with it		The student knows the basics of correlation and regression analysis			[SU1] Assessment of task fulfilment	
	[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>Course content – lecture</p> <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="448 575 1487 680"> <thead> <tr> <th data-bbox="448 575 794 611">Subject passing criteria</th> <th data-bbox="794 575 1141 611">Passing threshold</th> <th data-bbox="1141 575 1487 611">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 611 794 647">laboratory</td> <td data-bbox="794 611 1141 647">51.0%</td> <td data-bbox="1141 611 1487 647">60.0%</td> </tr> <tr> <td data-bbox="448 647 794 680">lecture</td> <td data-bbox="794 647 1141 680">51.0%</td> <td data-bbox="1141 647 1487 680">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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laboratory	51.0%	60.0%										
lecture	51.0%	40.0%										
Recommended reading	Basic literature	<p>Andrzej Stanisław, Przystępny kurs statystyki z zastosowaniem STATISTICA PL na przykładach z medycyny</p> <p>Jerzy A. Moczko, Grzegorz H. Bręborowicz, Ryszard Tadeusiewicz, Statystyka w badaniach medycznych</p> <p>Plucińska, A., & Pluciński, E. (2006). <i>Probabilistyka: rachunek prawdopodobieństwa, statystyka matematyczna, procesy stochastyczne</i>. Wydawnictwa Naukowo-Techniczne.</p>										
	Supplementary literature	<p>Wasilewska, E. (2015). <i>Statystyka matematyczna w praktyce</i>. Difin SA.</p> <p>Krysicki, W., Bartos, J., Dyczka, W., Królikowska, K., & Wasilewski, M. (1999). <i>Rachunek prawdopodobieństwa i statystyka matematyczna w zadaniach. Cz. II. Statystyka matematyczna</i>, PWN, Warszawa.</p>										
	eResources addresses											
Example issues/ example questions/ tasks being completed												
Practical activities within the subject	Not applicable											

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