GDAŃSK UNIVERSITY OF TECHNOLOGY

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 2024	Academic year of realisation of subject	2025/2026
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 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 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	Introduction to statistics (what it does, defining a statistical survey, preparing a survey, collecting observations, types of statistical features, developing statistical material). Descriptive statistics (goals, measures of position, measures of variability, measures of asymmetry, examples). Distribution series (goals, used, relevant examples). 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). Techniques of statistical inference (introduction, goals, estimation and estimators, verification of statistical hypotheses, tests for the mean, interpretation of results, examples). T-Student tests (introduction, goals, T-Student tests for unrelated and related variables, examples). Non-parametric tests (introduction, goals, comparison to parametric tests, examples). Analysis of variance (introduction, goals, examples). Basics of correlation and regression (goals, introductory concepts, partial correlations, nonparametric correlations, regression function, examples). Multi-way tables (goals, introductory concepts and analyzes, examples). 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
Prerequisites and co-requisites	knowledge of mathematical analysis
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
laboratory	51.0%	60.0%
lecture	51.0%	40.0%

Recommended reading	Basic literature	Andrzej Stanisz, Przystępny kurs statystyki z zastosowaniem STATISTICA PL na przykładach z medycyny Jerzy A. Moczko, Grzegorz H. Bręborowicz, Ryszard Tadeusiewicz, Statystyka w badaniach medycznych Plucińska, A., & Pluciński, E. (2006). *Probabilistyka: rachunek prawdopodobieństwa, statystyka matematyczna, procesy stochastyczne* . Wydawnictwa Naukowo-Techniczne.
	Supplementary literature	Wasilewska, E. (2015). *Statystyka matematyczna w praktyce*. Difin SA. Krysicki, W., Bartos, J., Dyczka, W., Królikowska, K., & Wasilewski, M. (1999). Rachunek prawdopodobieństwa i statystyka matematyczna w zadaniach. *Cz. II. Statystyka matematyczna, PWN, Warszawa*.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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