GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematical Statistics, PG_00068583						
Field of study	Economic Analytics						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2026/2027		
Education level	first-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	Part-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		5.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Department Of Statistics And Econometrics -> Faculty Of Management And Economics -> Wydziały Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor						
	Teachers						

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	16.0	0.0	16.0	0.0	0.0	32
	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	32	6.0	87.0	125

Subject objectives	Selects and uses appropriate statistical methods to analyze data, using statistical software to process and interpret the results.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W05] possesses advanced knowledge in integrating data from various sources and in methods that enable a comprehensive analysis of economic problems.	integrates data from multiple sources and, using a variety of statistical methods, obtains results usable in practical multidisciplinary applications	[SW1] Assessment of factual knowledge
	[K6_U07] uses advanced information technologies to enhance data analysis and decision-making processes.	uses statistical software to improve analysis of mass data to support decision-making processes	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information

Subject contents	Population and sample.
	Distributions of discrete and continuous random variables.
	Basic statistics and their distributions.
	Estimators and their properties.
	Point estimation.
	Interval estimation.
	Testing of statistical hypotheses.
	Significance level and power of a test.
	Parametric tests for one-dimensional populations.
	Parametric tests for two-dimensional populations.
	Tests for multidimensional populations.
	ANOVA. ANCOVA.
	MANOVA. MANCOVA.
	Nonparametric tests.
	Goodness of fit test. Normality tests.
	Chi-square test of independence.
	Randomness tests.
	Sign tests.
	The runs test.

Prerequisites and co-requisites	probability theory, descriptive statistics

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture - Final Exam	60.0%	50.0%
	Laboratory - Tests and Quizzes	60.0%	50.0%

Recommended reading	Basic literature	Wickham, H., Grolemund, G. (2017). R for Data Science. Import, Tidy, Transform, Visualize, and Model Data, O'Reilly. Ramachandran, K., Tsokos, C. P. (2020). Mathematical Statistics with Applications in R, Elsevier LTD.
	Supplementary literature	Field, Z., Miles, J. (2022). Discovering Statistics Using R. SAGE Publications Ltd.
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	A calculus task in probability and central limit theorems. A calculus task in point and interval estimation. Testing of parametric hypotheses. Testing of non-parametric hypotheses. Examination - theoretical issues.
Work placement	Not applicable

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