



Subject card

Subject name and code	MATHEMATICAL STATISTICS, PG_00070829						
Field of study	Economic Analytics						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2027/2028		
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	Full-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 -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Jarosław Krajewski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	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	60		3.0		62.0	125
Subject objectives	preparation of students to apply methods of mathematical statistics for data analysis and to support decision-making processes, based on knowledge of random variable distributions, estimation, and hypothesis testing in the context of economic data analysis and business decision-making.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U07] uses advanced information technologies to enhance data analysis and decision-making processes.		is able to use statistical software to process and analyze data, applying statistical methods to support decision-making.		[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools		
	[K6_W05] possesses advanced knowledge in integrating data from various sources and in methods that enable a comprehensive analysis of economic problems.		has knowledge and understanding of methods of mathematical statistics in the context of analyzing economic data from various sources.		[SW1] Assessment of factual knowledge		
	[K6_K03] is prepared to critically assess the knowledge they possess, which is necessary for solving cognitive and practical problems, and to supplement any gaps with opinions from external experts.		is ready to critically reflect on the results of statistical analyses and applied methods, recognize the limits of their knowledge, and seek expert opinions and specialized sources to complement it.		[SK5] Assessment of ability to solve problems that arise in practice		

Subject contents	Course content – lecture 1. Population and sample. 2. Basic rules of probability. Bayes' theorem. 3. Random variables, expected value, variance. 4. Distributions of discrete and continuous random variables. 5. Sample distributions. Point and interval estimation. 6. Testing statistical hypotheses. Significance level and test power. 7. Statistical tests and confidence intervals for one mean/proportion. 8. Statistical tests for two means/proportions. 9. Chi-square test. 10. Analysis of variance. 11. Tests of normality of distribution. 12. Non-parametric tests. 13. Tests in linear regression models		
	Course content – laboratory 1. Population and sample. 2. Basic rules of probability. Bayes' theorem. 3. Random variables, expected value, variance. 4. Distributions of discrete and continuous random variables. 5. Sample distributions. Point and interval estimation. 6. Testing statistical hypotheses. Significance level and test power. 7. Statistical tests and confidence intervals for one mean/proportion. 8. Statistical tests for two means/proportions. 9. Chi-square test. 10. Analysis of variance. 11. Tests of normality of distribution. 12. Non-parametric tests. 13. Tests in linear regression models		
Prerequisites and co-requisites	probability theory, descriptive statistics		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final Exam	60.0%	50.0%
	Calculation and decision-making tasks (test 1).	60.0%	25.0%
	Calculation and decision-making tasks (test 2).	60.0%	25.0%
Recommended reading	Basic literature	1. Wickham, H., Golemund, G. (2017). R for Data Science. Import, Tidy, Transform, Visualize, and Model Data, O'Reilly. 2. Ramachandran, K., Tsokos, C. P. (2020). Mathematical Statistics with Applications in R, Elsevier LTD.	
	Supplementary literature	1. Field, Z., Miles, J. (2022). Discovering Statistics Using R. SAGE Publications Ltd.	
	eResources addresses		
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.		
Practical activities within the subject	Not applicable		

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