Subject card

Subject name and code	MATHEMATICAL STATISTICS, PG_00066518			
Field of study	Economic Analytics			
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026	
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 (on-line)	Mode of delivery	blended-learning	
Year of study	2	Language of instruction	Polish	
Semester of study	3	ECTS credits	6.0	
Learning profile	general academic profile	Assessment form	exam	
Conducting unit	Department of Statistics and Econometrics -> Faculty of Management and Economics			
Name and surname of lecturer (lecturers)	Subject supervisor	dr Błażej Kochański		
	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: 24.0						

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	112.0	150

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 of data integration from multiple sources and advanced analytical methods, enabling the analysis of complex 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] Applies 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
	Laboratory - Tests and Quizzes	60.0%	50.0%
	Lecture - Final Exam	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: Statystyka matematyczna NS 2021_22 - Nowy - Moodle ID: 24210 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=24210

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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