GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematical Statistics, PG_00067942		
Field of study	Economics		
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	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	dr Jarosław Krajewski	

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

eNauczanie source addresses:

Moodle ID: 6785 Statystyka matematyczna 2026
https://enauczanie.pg.edu.pl/2025/course/view.php?id=6785

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	5.0	60.0	125

Subject objectives

Preparation of students to apply mathematical statistics methods to data analysis and decision-support processes, based on knowledge of random variable distributions, estimation, and hypothesis testing in the context of economic data analysis and economic 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 analyse 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.	knows and understands mathematical statistics methods in the context of analysing economic data from various sources.	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Course content – lecture

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.

Course content – laboratory

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.
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ANOVA. ANCOVA.
MANOVA. MANCOVA.
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Chi-square test of independence.
Randomness tests.
Sign tests.
The runs test.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>probability theory, descriptive statistics</td></tr>
<tr><td>Assessment methods and criteria</td><td><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Written exam</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>Calculation and decision-making tasks (Test 1)</td><td>60.0%</td><td>25.0%</td></tr>
<tr><td>Calculation and decision-making tasks (Test 2)</td><td>60.0%</td><td>25.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>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.</td></tr>
<tr><td>Supplementary literature</td><td>Field, Z., Miles, J. (2022). Discovering Statistics Using R. SAGE Publications Ltd.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>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.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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