GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	MATHEMATICS 1, PG_00058414		
Field of study	Economics, Economic Analytics		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	1	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Mathematics Center -> Vice-Rector for Education		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Renata Zakrzewska	
	Teachers	Nikodem Mrożek dr inż. Renata Zakrzewska	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	30.0	0.0	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	10.0	55.0	125

Subject objectives

Uses the apparatus of linear algebra and mathematical analysis to solve theoretical and practical problems occurring in social sciences

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W02] demonstrates comprehensive preparation in the field of methods, techniques for formulating and solving problems	uses a mathematical apparatus to solve economic problems, combining knowledge of mathematics with knowledge of social sciences	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation
[K6_U04] formulates logical solutions to complex or unstructured problems	integrates the information obtained from solving complex problems, interpreting them, drawing conclusions and formulating and justifying opinions	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools

Subject contents

Functions of one variable and their properties.
Elementary functions: absolute value, polynomials, rational functions, power functions, exponential and logarithmic functions, trigonometric and inverse trigonometric functions - properties, graphs, solving equations and inequalities.
Infinite sequences - properties, limits.
The limit and continuity of a function.
Derivatives and differentials of first and higher orders.
Rolle, Lagrange, de l'Hospital, Taylor-Maclaurin theorems.
Monotonicity and local extrema.
Convexity, concavity and inflexion points of a function.
Asymptotes.
Matrices, their properties and operations on matrices.
Determinants.
Systems of linear equations.

Prerequisites and co-requisites

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Class activity</td><td>50.0%</td><td>4.0%</td></tr>
<tr><td>Midterm colloquium</td><td>50.0%</td><td>63.0%</td></tr>
<tr><td>Class tests</td><td>50.0%</td><td>33.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>• Praca zbiorowa pod redakcją B. Wikieł, "Matematyka - Podstawy z elementami matematyki wyższej", Wydawnictwo PG, Gdańsk 2009
• J. Dymkowska, D. Beger, "Rachunek różniczkowy w zadaniach", Wydawnictwo PG, Gdańsk 2016
• T. Jurlewicz, Z. Skoczylas, "Algebra liniowa 1 - Definicje, twierdzenia, wzory ", Oficyna Wydawnicza GiS, Wrocław 2002
• T. Jurlewicz, Z. Skoczylas, "Algebra liniowa 1 - Przykłady i zadania", Oficyna Wydawnicza GiS, Wrocław 2002
• K. Jankowska, T. Jankowski, "Zbiór zadań"</td></tr>
<tr><td>Supplementary literature</td><td>• M. Gewert, Z. Skoczylas, "Analiza Matematyczna I - Definicje, twierdzenia, wzory", Oficyna Wydawnicza GiS, Wrocław 2001
• M. Gewert, Z. Skoczylas, "Analiza Matematyczna I - Przykłady i zadania", Oficyna Wydawnicza GiS, Wrocław 2001

Zasoby dydaktyczne na platformie moodle.</td></tr>
<tr><td>eResources addresses</td><td>Uzupełniające
Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">Find the derivatives of the following functions.
Find local extremes and intervals of monotonicity of the following function f(x)=.
Sketch the graph of the function f(x).
Identify any local extrema and points of inflection.
Find the rank of the matrix A.
Solve the systems of linear equations using the back substitution method.
Solve the systems of linear equations by Cramer rule.
Formulate the Kronecker-Capelli theorem.</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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