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 2022	Academic year of realisation of subject	2022/2023
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 Lech Kujawski	
	Teachers	Nikodem Mrożek dr Lech Kujawski	

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_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	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
[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	[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge

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>20.0%</td></tr>
<tr><td>Class tests</td><td>50.0%</td><td>60.0%</td></tr>
<tr><td>Midterm colloquium</td><td>50.0%</td><td>20.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>Wikieł, B. (2009). Matematyka, Podstawy z elementami matematyki wyższej. Gdańsk: Wydawnictwo PG
Jurlewicz, T, Gewert, M. Algebra liniowa 1, Definicje, twierdzenia wzory. Wrocław: Wydawnictwo GiS
Jankowska, K., Jankowski, T. Zbiór zadań z matematyki, Gdańsk: Wydawnictwo PG</td></tr>
<tr><td>Supplementary literature</td><td>Gewert, M., Skoczylas, Z. Wstęp do analizy i algebry. Wrocław: Wydawnictwo GiS
Batóg, B., i in. Matematyka dla kierunków ekonomicznych. Warszawa: Wydawnictwo Difin
Banaś J., Podstawy matematyki dla ekonomistów. Warszawa: Wydawnictwa Naukowo-Techniczne
Dymkowska J., Beger D., Rachunek różniczkowy w zadaniach. Gdańsk: Wydawnictwo PG
Zasoby dydaktyczne na platformie moodle.</td></tr>
<tr><td>eResources addresses</td><td>Podstawowe
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25598 - ecourse
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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