GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	MATHEMATICS 1, PG_00070714		
Field of study	Engineering Management		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study
Mode of study	Part-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	1	ECTS credits	6.0
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		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	18.0	27.0	0.0	0.0	0.0	45

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	45	3.0	102.0	150

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] possesses advanced knowledge of methods and techniques that enable precise formulation and effective problem solving.	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] develops logical solutions to complex or unstructured problems, even under conditions of uncertainty.	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

Course content – lecture

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

Course content – exercises

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

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Class tests	50.0%	33.0%
Midterm colloquium	50.0%	63.0%
Class activity	50.0%	4.0%

Recommended reading

Basic literature

1. Praca zbiorowa pod redakcją B. Wikieł, "Matematyka - Podstawy z elementami matematyki wyższej", Wydawnictwo PG, Gdańsk 2009
2. J. Dymkowska, D. Beger, "Rachunek różniczkowy w zadaniach", Wydawnictwo PG, Gdańsk 2016
3. T. Jurlewicz, Z. Skoczylas, "Algebra liniowa 1 - Definicje, twierdzenia, wzory ", Oficyna Wydawnicza GiS, Wrocław 2002
4. T. Jurlewicz, Z. Skoczylas, "Algebra liniowa 1 - Przykłady i zadania", Oficyna Wydawnicza GiS, Wrocław 2002
5. K. Jankowska, T. Jankowski, "Zbiór zadań"

Supplementary literature

1. M. Gewert, Z. Skoczylas, "Analiza Matematyczna I - Definicje, twierdzenia, wzory", Oficyna Wydawnicza GiS, Wrocław 2001
2. M. Gewert, Z. Skoczylas, "Analiza Matematyczna I - Przykłady i zadania", Oficyna Wydawnicza GiS, Wrocław 2001
3. Teaching materials available on the Moodle platform.

eResources addresses

Example issues/ example questions/ tasks being completed

- 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.

Practical activites within the subject

Not applicable

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