GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	MATHEMATICS 1, PG_00058542		
Field of study	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	Part-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 Stanisław Domachowski	
	Teachers	mgr inż. Krystyna Dąbrowska dr Stanisław Domachowski	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	16.0	16.0	0.0	0.0	0.0	32

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	32	10.0	83.0	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 advanced knowledge of methods and techniques related to the field of study in economic analytics to explain complex 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] Develops logical solutions to complex or unstructured problems in processes conducted 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	Functions of one variable and their properties: The absolute value function definition, solving equations and inequalities with absolute value, graphs of functions with absolute value. Power functions solving power and polynomial equations and inequalities. Rational functions solving rational equations and inequalities. Exponential function properties and graphs, solving exponential equations and inequalities. Logarithmic functions properties and graphs, solving logarithmic equations and inequalities. Trigonometric and cyclometric functions properties and graphs, solving trigonometric equations and inequalities. Limits and continuity: Infinite sequences. Fundamental definitions of limit of sequence, convergence and divergence, limit theorems. Applications to solving equations . Differential calculus of functions with one variable and applications of differential calculus of functions with one variable. Higher derivatives and differentials. Monotonicity and local extrema. Convexity, concavity and inflexion points of a function. De lHospitals Theorem. Asymptotes. Applying differential calculus to studying the properties of functions with one variable. Integral calculus of functions with one variable antiderivatives: The process of finding antiderivatives and integration formulas the substitution method of integration and integration by parts.
Prerequisites and co-requisites	Knowledge of high school level mathematics.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Tests	50.0%	20.0%
Activity	50.0%	20.0%
Exam	50.0%	60.0%

Recommended reading

Basic literature	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
Supplementary literature	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.
eResources addresses	Adresy na platformie eNauczanie: WZiE - AG, ZI niestacjonarne - Matematyka I 2024/25 (S.Domachowski) - Moodle ID: 40375 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=40375

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 Determine indefinite integrals of the following functions using methods of integration by parts or by substitution .

Work placement	Not applicable

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