GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematics I, PG_00068901
Field of study	Matematyka I

Date of commencement of studies	October 2025	Academic year of realisation of subject	2025/2026
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	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** mgr Katarzyna Kujawska
	Teachers mgr Katarzyna Kujawska mgr Tomasz Kinowski mgr Monika Jędrzejewska

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	45.0	0.0	0.0	0.0	75
	E-learning hours included: 0.0						
	eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=682						
	Moodle ID: 682 WCh - TK sem.1 - Matematyka 2025/26 (K.Kujawska) https://enauczanie.pg.edu.pl/2025/course/view.php?id=682						

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	75	5.0	70.0	150

Subject objectives	Students will acquire competence in using mathematical analysis and linear algebra tools and the ability to solve simple problems encountered in engineering fields.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W06] recognizes technological and scientific possibilities and limitations, as well as organizational and economic ones, in cosmetics technology and related fields	The student appreciates the importance of skilful use of basic mathematical apparatus in the context of studies in technical fields. The student is able to integrate the information obtained, interpret it, draw conclusions, and formulate and justify opinions.	[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym
	[K6_W04] selects data analysis methods, including statistical, modeling and artificial intelligence, useful for solving technological and scientific problems in the field of cosmetic technology and related fields	The student lists the basic properties of elementary functions. The student solves equations and inequalities containing elementary functions. The student defines the basic concepts of differential calculus. The student applies the basic concepts and formulas of differential calculus. The student determines the intervals of monotonicity and extrema of a given function.	[SW1] Ocena wiedzy faktograficznej

Subject contents	Course content – lecture Functions of one variable: definitions, graphs, properties, continuity, limits definition of absolute value polynomials, rational functions, power functions, trigonometric and cyclometric functions, exponential and logarithmic functions definition of inverse function Numerical sequences, limits and continuity of functions definition of a sequence, boundedness and monotonicity of a sequence, definition of a limit of a sequence, definitions of a limit of a single variable function continuity of a function, types of discontinuity points Differential calculus of single variable functions: definition of a derivative and a differential L'Hospital's rule monotonicity of functions, necessary and sufficient conditions for the existence of extrema higher-order derivatives concavity, convexity, inflection points application of differential calculus in other fields (physics, chemistry, etc.)
	Course content – exercises Functions of one variable: definitions, graphs, properties, continuity, limits definition of absolute value polynomials, rational functions, power functions, trigonometric and cyclometric functions, exponential and logarithmic functions definition of inverse function Numerical sequences, limits and continuity of functions definition of a sequence, boundedness and monotonicity of a sequence, definition of a limit of a sequence, definitions of a limit of a single variable function continuity of a function, types of discontinuity points Differential calculus of single variable functions: definition of a derivative and a differential L'Hospital's rule monotonicity of functions, necessary and sufficient conditions for the existence of extrema higher-order derivatives concavity, convexity, inflection points application of differential calculus in other fields (physics, chemistry, etc.)

Prerequisites and co-requisites	None

Assessment methods and criteria			
	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written or oral exam	50.0%	50.0%
	Tests	0.0%	50.0%

Recommended reading	Basic literature	- Praca zbiorowa pod redakcją Wikieł B.: Matematyka - Podstawy z elementami matematyki wyższej. PG, Gdańsk 2007; - M. Gewert, Z. Skoczylas : Analiza matematyczna 1, Oficyna Wydawnicza GiS 2008; - K. Jankowska, T. Jankowski : Zbiór zadań z matematyki, Wydawnictwo PG, 2010.
	Supplementary literature	- G.M. Fichtenholz : Rachunek różniczkowy i całkowy I, PWN 1985; - R. Leitner : Zarys matematyki wyższej I i II, Wydawnictwo NaukowoTechniczne Warszawa 1999; - L. Maurin, M. Maczyński, T. Traczyk : Matematyka - podręcznik dla studentów wydziałów chemicznych, PWN 1975. - W. Żakowski, G. Decewicz : Matematyka I I II, Wydawnictwo Naukowo-Techniczne, Warszawa 1991. - W.Krysicki, L.Włodarski : Analiza matematyczna w zadaniach. cz1, Wydawnictwo Naukowe PWN
	eResources addresses	

Example issues/ example questions/ tasks being completed	1. Determine the domain and zero points of the function. 2. Solve equations and inequalities. 3. Calculate the limits of sequences/functions. 4. Examine the continuity of the function. 5. Determine the intervals of monotonicity and local extrema of the function. 6. Determine the intervals of convexity of the function and the inflection points of its graph.

Practical activites within the subject	Not applicable

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