



Subject card

Subject name and code	Mathematics I, PG_00068901						
Field of study	Cosmetic technologies						
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	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				
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 addresses: Moodle ID: 6175 WCh - TK sem.1 - Matematyka 2026/27 (K.Kujawska) https://enauczanie.pg.edu.pl/2025/course/view.php?id=6175						
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_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		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] Assessment of factual knowledge		
	[K6_W06] recognizes technological and scientific possibilities and limitations, as well as organizational and economic ones, in cosmetics technology and related fields		has knowledge to 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] Assessment of knowledge contained in written work and projects		

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
	Tests	0.0%	50.0%
	Written or oral exam	50.0%	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 activities within the subject	Not applicable		

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