



Subject card

Subject name and code	Mathematical analysis, PG_00062719						
Field of study	Technologies for Industry 5.0						
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	2		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 Hanna Guze				
	Teachers		dr Hanna Guze				
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		5.0		85.0	150
Subject objectives	Students obtain competence in using methods of mathematical analysis (single variable calculus) and knowledge how to solve simple problems that are found in the field of engineering.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_K01] is aware of the need to constantly update and enrich knowledge and practical skills, and improve professional, personal and social competences		Student understands the need of lifelong learning and is able to inspire others and organize their learning process.		[SK1] Assessment of group work skills [SK3] Assessment of ability to organize work [SK2] Assessment of progress of work		
	[K6_W01] demonstrates knowledge and understanding of mathematics, physics, chemistry and IT tools at the level necessary to formulate and solve typical engineering and technological problems		Student names basic properties of elementary functions. Student geometrically interprets the results of examining the graph of a function using the concepts of limit, continuity and derivatives of a function. Student uses definite integral to solve geometrical problems. Student combines knowledge of mathematics with knowledge from other fields.		[SW1] Assessment of factual knowledge		
	[K6_U01] applies knowledge of mathematics, physics, chemistry, IT tools and other engineering disciplines to solve theoretical, engineering and technological problems		Student is able to process the acquired information, analyze and interpret it, draw conclusions and reason opinions. Student uses methods of mathematical description of phenomena in the physical , mechanical and chemical processes.		[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		

Subject contents	Elementary functions and their properties.		
	Sequences. Limits and continuity of one-variable functions.		
	Differential calculus of one variable functions and its applications.		
	Antiderivate:		
	<ul style="list-style-type: none">• The substitution method of integration and integration by parts.• Integration of rational, trigonometric and irrational functions.		
	Definite and improper integrals:		
	<ul style="list-style-type: none">• Geometrical applications and applications to other fields.		
Prerequisites and co-requisites	Working knowledge of the concepts of the first semester of mathematics.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written and/or oral exam	50.0%	50.0%
	Tests and activity during classes	0.0%	50.0%
Recommended reading	Basic literature	Praca zbiorowa pod redakcja B.Wikieł, Matematyka. Podstawy z elementami matematyki wyższej. Wydawnictwo Politechniki Gdanskiej, Gdansk, 2007.	
		K. Jankowska, T. Jankowski, Zbiór zadań z matematyki. Wydawnictwo Politechniki Gdanskiej , Gdansk, 2007.	
		Jerzy Topp, Matematyka. Funkcje jednej zmiennej, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk 2016	
	Supplementary literature	M.Gewert, Z.Skoczylas, Analiza matematyczna I - Definicje, twierdzenia, wzory, Oficyna Wydawnicza GiS	
		M.Gewert, Z.Skoczylas, Analiza matematyczna I - Przykłady i zadania, Oficyna Wydawnicza GiS	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Find the domian and the range of the function $f(x) = \dots$. Find the inverse function to the following function.		
	Find the derivative of $f(x)= \dots$. Find the intervals on which the function is convex and decreasing.		
	Sketch the graph of the function $f(x)= \dots$. Identify any local extrema and points of inflection.		
	Evaluate the given integrals.		
	Find the volume of a solid of revolution obtained by rotating the graph of the function $f(x)= \dots$ about the OX axis.		
Work placement	Not applicable		

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