

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematical analysis, PG_00062719								
Field of study	Technologies for Industry 5.0								
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	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	Mathematics Center -> Vice-Rector for Education							
Name and surname	Subject supervisor		dr Hanna Guze						
of lecturer (lecturers)	Teachers								
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
of instruction	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 classes includ	n didactic led in study	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.			[SK2] Assessment of progress of work [SK3] Assessment of ability to organize work [SK1] Assessment of group work skills			
	[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.			[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment			

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:							
	 The substitution method of integration and integration by parts. Integration of rational, trigonometric and irrational functions. 							
	Definite and improper integrals:							
	Geometrical applications and applications to other fields.							
Prerequisites and co-requisites	Working knowledge of the concepts of the first semester of mathematics.							
Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade					
and criteria	Tests and activity during classes	0.0%	50.0%					
	Written and/or oral exam	45.0%	50.0%					
Recommended reading	Basic literature Supplementary literature	Praca zbiorowa pod redakcja B.Wikieł, Matematyka. Podstawy z elementami matematyki wyższej. Wydawnictwo Politechniki Gdanskiej, Gdansk, 2007. K. Jankowska, T. Jankowski, Zbior zadan z matematyki. Wydawnictwo Politechniki Gdanskiej , Gdansk, 2007. Jerzy Topp, Matematyka. Funkcje jednej zmiennej, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk 2016 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 $f(x) =$. Find the inverse function to the following function.							
	Find the derivative of $f(x)$ = . Find the intervals on which the function is convex and decreasing.							
	Sketch the graph of the function $f(x)$ = . 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)= about the OX axis.							
Work placement	Not applicable							

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