



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 -> Vice-Rector for Education						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Hanna Guze				
	Teachers						
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.		[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	<p>Elementary functions and their properties.</p> <p>Sequences. Limits and continuity of one-variable functions.</p> <p>Differential calculus of one variable functions and its applications.</p> <p>Antiderivate:</p> <ul style="list-style-type: none"> • The substitution method of integration and integration by parts. • Integration of rational, trigonometric and irrational functions. <p>Definite and improper integrals:</p> <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	<table border="1"> <thead> <tr> <th data-bbox="456 622 794 651">Subject passing criteria</th> <th data-bbox="799 622 1137 651">Passing threshold</th> <th data-bbox="1142 622 1469 651">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 658 794 687">Tests and activity during classes</td> <td data-bbox="799 658 1137 687">0.0%</td> <td data-bbox="1142 658 1469 687">50.0%</td> </tr> <tr> <td data-bbox="456 694 794 723">Written and/or oral exam</td> <td data-bbox="799 694 1137 723">45.0%</td> <td data-bbox="1142 694 1469 723">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Tests and activity during classes	0.0%	50.0%	Written and/or oral exam	45.0%	50.0%
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Recommended reading	<p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>	<p>Praca zbiorowa pod redakcja B.Wikieł, Matematyka. Podstawy z elementami matematyki wyższej. Wydawnictwo Politechniki Gdanskiej, Gdansk, 2007.</p> <p>K. Jankowska, T. Jankowski, Zbior zadan z matematyki. Wydawnictwo Politechniki Gdanskiej , Gdansk, 2007.</p> <p>Jerzy Topp, Matematyka. Funkcje jednej zmiennej, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk 2016</p> <p>M.Gewert, Z.Skoczylas, Analiza matematyczna I - Definicje, twierdzenia, wzory, Oficyna Wydawnicza GiS</p> <p>M.Gewert, Z.Skoczylas, Analiza matematyczna I - Przykłady i zadania, Oficyna Wydawnicza GiS</p> <p>Adresy na platformie eNauczanie:</p>										
Example issues/ example questions/ tasks being completed	<p>Find the domain and the range of the function $f(x) = \dots$. Find the inverse function to the following function.</p> <p>Find the derivative of $f(x) = \dots$. Find the intervals on which the function is convex and decreasing.</p> <p>Sketch the graph of the function $f(x) = \dots$. Identify any local extrema and points of inflection.</p> <p>Evaluate the given integrals.</p> <p>Find the volume of a solid of revolution obtained by rotating the graph of the function $f(x) = \dots$ about the OX axis.</p>											
Work placement	Not applicable											

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