



Subject card

Subject name and code	Mathematical Analysis, PG_00021019						
Field of study	Mathematics						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2023/2024		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study Subject group related to scientific research 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			9.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Zdzisław Dzedzej					
	Teachers	dr inż. Karol Wroński dr Maryna Shcholakova mgr inż. Tomasz Gzella dr inż. Maciej Starostka dr hab. Zdzisław Dzedzej					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	60.0	60.0	0.0	0.0	0.0	120
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	120	5.0		100.0		225
Subject objectives	To familiarize students with the basic tools of mathematical analysis.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_W07	knowledge of derivatives and their properties, and integral calculus			[SW1] Assessment of factual knowledge		
	K6_U06	calculates simple integrals and geometric applications			[SU4] Assessment of ability to use methods and tools		
	K6_U04	calculates limits of sequences and functions, verifies series for convergence			[SU4] Assessment of ability to use methods and tools		
	K6_U02	simple deduction, verification of theorems and definitions on examples			[SU3] Assessment of ability to use knowledge gained from the subject		
K6_W02	knowledge of basic theorems and definitions			[SW1] Assessment of factual knowledge			

Subject contents	<p>1. Real numbers.</p> <p>2. Theory of sequences of numbers.</p> <p>3. Theory of series.</p> <p>4. Limit of a function. Continuity of a function.</p> <p>5. Differentiability of a function.</p> <p>6. Theory of Riemann integral.</p> <p>7. Indefinite integral.</p> <p>8. Improper integral.</p> <p>9. Sequences and series of functions.</p>																				
Prerequisites and co-requisites	No requirements																				
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="459 864 794 898">Subject passing criteria</th> <th data-bbox="802 864 1137 898">Passing threshold</th> <th data-bbox="1145 864 1469 898">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="459 909 794 943">Test no. 1</td> <td data-bbox="802 909 1137 943">50.0%</td> <td data-bbox="1145 909 1469 943">27.0%</td> </tr> <tr> <td data-bbox="459 954 794 987">Test no. 2</td> <td data-bbox="802 954 1137 987">50.0%</td> <td data-bbox="1145 954 1469 987">27.0%</td> </tr> <tr> <td data-bbox="459 999 794 1032">Activity in the classes</td> <td data-bbox="802 999 1137 1032">0.0%</td> <td data-bbox="1145 999 1469 1032">9.0%</td> </tr> <tr> <td data-bbox="459 1043 794 1077">Activity at the lectures</td> <td data-bbox="802 1043 1137 1077">0.0%</td> <td data-bbox="1145 1043 1469 1077">9.0%</td> </tr> <tr> <td data-bbox="459 1088 794 1122">Exam</td> <td data-bbox="802 1088 1137 1122">50.0%</td> <td data-bbox="1145 1088 1469 1122">28.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Test no. 1	50.0%	27.0%	Test no. 2	50.0%	27.0%	Activity in the classes	0.0%	9.0%	Activity at the lectures	0.0%	9.0%	Exam	50.0%	28.0%
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Recommended reading	Basic literature	<p>1. W. Kołodziej, Analiza matematyczna, Wydawnictwo Naukowe PWN, Warszawa, 2009</p> <p>2. W. Kryszeński, Wykład analizy matematycznej, cz. I, Funkcje jednej zmiennej, Wydawnictwo Naukowe UMK, Toruń, 2009</p> <p>3. J. Jost, Postmodern Analysis, Universitext, Springer, Berlin, 2005</p>																			
	Supplementary literature	<p>1. R. Rudnicki, Wykłady z analizy matematycznej, Wydawnictwo Naukowe PWN, Warszawa, 2006</p> <p>2. W. Rudin, Podstawy analizy matematycznej, Wydawnictwo Naukowe PWN, Warszawa, 2009</p> <p>3. K. Kuratowski, Rachunek różniczkowy i całkowy, PWN, Warszawa, 1964</p> <p>4. G.M. Fichtenholz, Rachunek różniczkowy i całkowy, Tom 1, Wydawnictwo Naukowe PWN 2007</p> <p>5. K. Maurin, Analiza, Tom 1, Wydawnictwo Naukowe PWN, Warszawa, 2010</p>																			
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>Analiza matematyczna 1 23/24 - Moodle ID: 30898 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30898</p>																			

Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none">• Calculate the limit of a sequence.• Calculate the limit of a function.• Check the continuity of a function.• Check the differentiability of a function.• Calculate the derivative of a function.• Find an antiderivative of a function.• Calculate a Riemann integral.• Examine the convergence of a series.• Calculate the sum of a series.
Work placement	Not applicable