



Subject card

Subject name and code	Mathematical Analysis I, PG_00060215						
Field of study	Technical Physics						
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 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				10.0	
Learning profile	general academic profile	Assessment form				exam	
Conducting unit	Division Of Electron Collisions Physics -> Institute Of Physics And Applied Computer Science -> Faculty Of Applied Physics And Mathematics -> Wydziały Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Maciej Kuna				
	Teachers		dr Maciej Kuna dr hab. inż. Maciej Demianowicz				
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		10.0		120.0	250
Subject objectives	Endowment of student to mathematical knowledge helping technical subjects						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K6_U01] learns independently, obtains information from literature, databases and other properly selected sources		Student understands the importance of studying by himself. Student is practising by himself.			[SU2] Assessment of ability to analyse information	
	[K6_W03] has systematized knowledge of higher mathematics, including algebra, analysis, probability theory and numerical methods, allowing for basic description, understanding and modelling of physical phenomena and some technical processes		Student calculate limits of sequences of numbers and functions. Study monotonicity and extremas of a function. Student knows basic notions of differential calculus of functions of one variable. Can calculate indefinite integral using methods integration by parts and integration by substitution. Student understands mathematical theorems and it uses with they of solving exercises.			[SW1] Assessment of factual knowledge	

Subject contents	<p>Elements of logic and set theory.</p> <p>Functions and relationships</p> <p>Numerical sets</p> <p>Introduction to metric spaces</p> <p>Sequences and Series</p> <p>Metric spaces</p> <p>Limit and continuity of function</p> <p>Properties of continuous functions</p> <p>Derivative of a function of one variable</p> <p>Mean value theorems and their applications</p> <p>Derivatives of functions of many variables</p> <p>Function extremes</p> <p>The inverse function theorem and its applications</p> <p>Integrals</p>											
Prerequisites and co-requisites	Student knows basic mathematical notions											
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="459 1267 794 1301">Subject passing criteria</th> <th data-bbox="802 1267 1137 1301">Passing threshold</th> <th data-bbox="1145 1267 1481 1301">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="459 1312 794 1335">Exercise</td> <td data-bbox="802 1312 1137 1335">60.0%</td> <td data-bbox="1145 1312 1481 1335">50.0%</td> </tr> <tr> <td data-bbox="459 1346 794 1368">Examination</td> <td data-bbox="802 1346 1137 1368">60.0%</td> <td data-bbox="1145 1346 1481 1368">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Exercise	60.0%	50.0%	Examination	60.0%	50.0%
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Recommended reading	Basic literature	<p>R. Rudnicki "Wykłady z analizy matematycznej" PWN Warszawa 2020</p> <p>D.A. McQuarrie "Matematyka dla przyrodników i inżynierów" Tom 1, PWN, Warszawa 2012</p> <p>K.A. Stroud, D.J. Booth "Matematyka od zera dla inżyniera" Pęta 2021</p> <p>W. Krysicki, L. Włodarski "Analiza matematyczna w zadaniach" Tom I, PWN Warszawa 2023</p>										
	Supplementary literature	<p>L. Górniewicz, R.S. Ingarden "Analiza matematyczna dla fizyków" Tom 1, PWN Warszawa 1981</p> <p>K. Maurin "Analiza część 1" PWN Warszawa 2010</p> <p>K. Jankowska, T. Jankowski, Zbiór zadań z matematyki. Wydawnictwo Politechniki Gdańskiej, 2009</p>										

	eResources addresses	Adresy na platformie eNauczenie:
Example issues/ example questions/ tasks being completed	Find extremum of given function $f(x)$	
	Find the limit of given function $f(x)$	
	Calculate the integral of given function $f(x)$	
	Calculate the derivative of given function $f(x)$	
	Expand of given function $f(x)$ in series	
Work placement	Not applicable	

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