



## Subject card

Subject name and code	Mathematical Analysis I, PG_00060215						
Field of study	Technical Physics						
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		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 hab. Paweł Możejko				
	Teachers		mgr inż. Natalia Tańska				
			dr hab. Paweł Możejko				
			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] Can learn independently, obtain 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	Elements of logic and set theory.		
	Functions and relationships		
	Numerical sets		
	Introduction to metric spaces		
	Sequences and Series		
	Metric spaces		
	Limit and continuity of function		
	Properties of continuous functions		
	Derivative of a function of one variable		
	Mean value theorems and their applications		
	Derivatives of functions of many variables		
	Function extremes		
	The inverse function theorem and its applications		
	Integrals		
Prerequisites and co-requisites	Student knows basic mathematical notions		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exercise	60.0%	50.0%
	Examination	60.0%	50.0%
Recommended reading	Basic literature	R. Rudnicki "Wykłady z analizy matematycznej" PWN Warszawa 2020  D.A. McQuarrie "Matematyka dla przyrodników i inżynierów" Tom 1, PWN, Warszawa 2012  K.A. Stroud, D.J. Booth "Matematyka od zera dla inżyniera" Pętla 2021  W. Krynicki, L. Włodarski "Analiza matematyczna w zadaniach" Tom I, PWN Warszawa 2023	
	Supplementary literature	L. Górniewicz, R.S. Ingarden "Analiza matematyczna dla fizyków" Tom 1, PWN Warszawa 1981  K. Maurin "Analiza część 1" PWN Warszawa 2010  K. Jankowska, T. Jankowski, Zbiór zadań z matematyki. Wydawnictwo Politechniki Gdańskiej, 2009	

	eResources addresses	Adresy na platformie eNauczenie: Analiza Matematyczna I 2023/2024 - Moodle ID: 33003 <a href="https://enauczenie.pg.edu.pl/moodle/course/view.php?id=33003">https://enauczenie.pg.edu.pl/moodle/course/view.php?id=33003</a>
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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