



Subject card

Subject name and code	Mathematical Analysis, PG_00021031						
Field of study	Mathematics						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2022/2023		
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	2		ECTS credits		10.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Department of Nonlinear Analysis and Statistics -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Marcin Styborski				
	Teachers		dr inż. Robert Krawczyk dr inż. Marcin Styborski dr Maryna Shcholokova				
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		125.0	250
Subject objectives	To familiarize students with basic tools of mathematical analysis. Part II.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_U06		A student calculates integrals of functions of one variable.		[SU4] Assessment of ability to use methods and tools		
	K6_U03		A student uses the language of set theory on the basis of mathematical analysis.		[SU3] Assessment of ability to use knowledge gained from the subject		
	K6_W07		A student can calculate partial and directional derivatives of functions of several variables. A student is able to find a gradient of function. A student can find the Frechet derivative of a function.		[SW1] Assessment of factual knowledge		
	K6_U04		A student knows an axiomatic theory of real numbers.		[SU3] Assessment of ability to use knowledge gained from the subject		
	K6_W04		A student knows theorems discussed in the lecture.		[SW1] Assessment of factual knowledge		
Subject contents	1. Euclidean spaces. 2. Limits and continuity of functions of several variables. 3. Differentiability of functions of several variables. 4. Extremes of functions of several variables. 5. Inverse function theorem. 6. Implicit function theorem.						
Prerequisites and co-requisites	Mathematical analysis of functions of one variable.						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exam	50.0%	28.0%
	Test no. 1	50.0%	27.0%
	Test no. 2	50.0%	27.0%
	Activity in the classes and at the lecture	0.0%	18.0%
Recommended reading	Basic literature	1. J. Jost, Postmodern Analysis, Universitext, Springer, Berlin, 2005. 2. W. Rudin, Podstawy analizy matematycznej, PWN, Warszawa, 2009. 3. G. M. Fichtenholz, Rachunek różniczkowy i całkowy, t.1, PWN, Warszawa, 2007. 4. M. Spivak, Analiza na rozmaitościach, PWN, Warszawa, 1977. 5. W. Kołodziej, Analiza matematyczna, PWN, Warszawa, 2009.	
	Supplementary literature	A. Birkholc, Analiza matematyczna, PWN, Warszawa, 1986.	
	eResources addresses	Adresy na platformie eNauczanie: Analiza Matematyczna II - Moodle ID: 26917 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26917	
	Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none">• Calculate limits of functions of several variables.• Examine the continuity of functions of several variables.• Determine the Frechet derivative of a function.• Calculate partial derivatives of functions of several variables.• Determine extremes of functions of several variables.	
Work placement	Not applicable		