GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematical Analysis, PG_00021031		
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	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. Marcin Styborski dr inż. Robert Krawczyk dr inż. Anita Zgorzelska	

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

Adresy na platformie eNauczanie:

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.

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Exam</td><td>50.0%</td><td>28.0%</td></tr>
<tr><td>Test no. 1</td><td>50.0%</td><td>27.0%</td></tr>
<tr><td>Test no. 2</td><td>50.0%</td><td>27.0%</td></tr>
<tr><td>Activity in the classes and at the lecture</td><td>0.0%</td><td>18.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>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.</td></tr>
<tr><td>Supplementary literature</td><td>A. Birkholc, Analiza matematyczna, PWN, Warszawa, 1986.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">• 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.</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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