GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematics II, PG_00055702		
Field of study	Architecture		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	first-cycle studies	Subject group	Obligatory subject group 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	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Mathematics Center -> Vice-Rector for Education		
Name and surname of lecturer (lecturers)	Subject supervisor	mgr Katarzyna Kujawska	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	30.0	0.0	0.0	0.0	45

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	45	6.0	24.0	75

Subject objectives

Students obtain competence in the range of using methods of mathematical analysis and knowledge how to solve simple problems that can be found in the field of engineering.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W01] knows and understands construction problems, building and engineering issues related to building design; principles, solutions, constructions and building materials used in simple engineering tasks in the field of architectural and urban design	Student recognizes the importance of skillful use of basic mathematical apparatus in terms of study in the future.	[SW1] Assessment of factual knowledge
[K6_U04] is able to use analytical methods to formulate and solve project tasks	Student defines the basic concepts of differential calculus of one variable function Student uses the first and second derivatives of a function to analyze its properties. Student applies the basic rules and techniques of integration to calculate indefinite integrals Student uses definite integral to solve geometrical problems Student calculates partial derivatives of a function of two variables Students calculates double integrals, and explains the method of substitution in the double integral Student applies double integrals in solving geometrical problems	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information

<table>
<tr><td>Subject contents</td><td>Derivatives of the first order. Differentiation of elementary functions. Tangent to a curve at the point. Differentiation of composite functions. Indeterminate forms and de lHospitals Rule. Asymptotes. Extrema of a function. Points of inflexion .

Indefinite integrals, Formula for the integration by parts. Formula for the integration by substitution. Definite integrals. Geometric application of definite integrals. The integral as an area. The length of an arc. The volume and surface area of a solid of revolution.

Partial derivatives. Double integral over a rectangle . Double integral over the normal domain. Change of variables in a double integral. Applications of the double integral.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>No requirements</td></tr>
<tr><td>Assessment methods and criteria</td><td><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>75.0%</td></tr>
<tr><td>Midterm tests</td><td>50.0%</td><td>25.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>Praca zbiorowa pod redakcją B. Wikieł, Matematyka - Podstawy z elementami matematyki wyższej, PG, Gdańsk 2007

K. Jankowska, T. Jankowski, Zbiór zadań z matematyki, PG, Gdańsk 1997

K. Jankowska, T. Jankowski, Funkcje wielu zmiennych, geometria analityczna, całki wielokrotne, PG, Gdańsk 1997</td></tr>
<tr><td>Supplementary literature</td><td>Praca zbiorowa pod red. E. Mieloszyka, Matematyka Materiały pomocnicze do ćwiczeń, PG, Gdańsk 2004 R. Leitner, Zarys matematyki wyższej I i II, Wydawnictwo Naukowo-Techniczne, Warszawa 2001 R. Leitner, W. Matuszewski, Z. Rojek, Zadania z matematyki wyższej I i II, Wydawnictwo Naukowo-Techniczne, Warszawa 1999 M. Gewert, Z. Skoczylas, Analiza matematyczna 1 Definicje, twierdzenia, wzory, Oficyna Wydawnicza GiS, Wrocław 2001 M. Gewert, Z. Skoczylas, Analiza matematyczna 1 Przykłady i zadania, Oficyna Wydawnicza GiS, Wrocław 2001 W. Krysicki, L. Włodarski, Analiza matematyczna w zadaniach I i II, Wydawnictwo Naukowe PWN, Warszawa 1998</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. Find local extremes and intervals of monotonicity of the function f(x)= .
2. Determine indefinite integrals of the following functions using the known methods ...
3. Find the area of the region bounded by y=, y= , x= and x=
4. Compute the second order partial derivatives of the given function f(x,y)
5. Compute the double integral of the given function f(x,y) over the region D.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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