GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematics II, PG_00055648		
Field of study	Architecture		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
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	English
Semester of study	2	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Magdalena Łapińska	
	Teachers		

Lesson types

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 using methods of mathematical analysis (single variable calculus) and knowledge how to solve simple problems that are found in the field of engineering, in particular connected to data engineering.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U04] is able to use analytical methods to formulate and solve project tasks	Student applies the concepts of limit, continuity, and derivatives of functions to solve curve sketching problems. Student uses definite integral to solve geometrical problems	[SU4] Assessment of ability to use methods and tools
[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	knows and understands mathematics to the extent necessary to formulate and solve tasks in the area of architectural and urban design; defines basic concepts of differential and integral calculus on single-variable function. Student gives the graphical interpretation of definite integral. Student lists geometrical applications of definite integrals	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Course content – lecture
• Partial derivatives
• Double integral over a rectangular region. Change of variables in double integral. Applications
• Continuity.
• Derivative of a function of one variable. Geometrical and physical interpretation. Basic differentiation formulas.
• Product, quotient, and chain rules.
• Applications of differentiation. Optimization. Concavity.
• Indefinite integral. Basic formulas. Integration by parts, by substitution
• Definite integral. Geometrical interpretation. Fundamental Theorem of Calculus.
• Geometrical applications of definite integrals: areas, volumes, lengths.
• Partial derivatives
• Double integral over rectangular and normal regions. Change of variables in double integral. Applications
Course content – exercises
• Partial derivatives
• Double integral over a rectangular region. Change of variables in double integral. Applications
• Continuity.
• Derivative of a function of one variable. Geometrical and physical interpretation. Basic differentiation formulas.
• Product, quotient, and chain rules.
• Applications of differentiation. Optimization. Concavity.
• Indefinite integral. Basic formulas. Integration by parts, by substitution
• Definite integral. Geometrical interpretation. Fundamental Theorem of Calculus.
• Geometrical applications of definite integrals: areas, volumes, lengths.
• Partial derivatives
• Double integral over rectangular and normal regions. Change of variables in double integral. Applications</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></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>Homework assignments</td><td>0.0%</td><td>20.0%</td></tr><tr><td>Final Exam</td><td>50.0%</td><td>80.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td>Basic literature</td><td>• H. Anton, Calculus with analytic geometry, John Wiley & Sons, 1989.
• Matematyka. Podstawy z elementami matematyki wyższej, edited by B. Wikieł, PG publishing house
• J.Dymkowska, D.Beger, Rachunek różniczkowy w zadaniach, PG publishing hous
• J.Dymkowska, D.Beger, Rachunek całkowy w zadaniach, PG publishing house</td></tr>
</table>

	Supplementary literature	• B.Sikora, E.Łobos, *A first course in calculus,* Publishing house of Silesian University of Technology, 2010. • H. Anton, *Calculus : a new horizon,* John Wiley & Sons, 6th ed • K. Jankowska, T. Jankowski, *Zbiór zadań z matematyki,* PG publishing house, 2010 • W. Żakowski, *Algebra i analiza matematyczna dla licealistów i kandydatów na wyższe uczelnie,* WNT, Warszawa 1999 • M. Gewert, Z.Skoczylas, *Analiza Matematyczna 1,* GiS • M.Gewert, Z. Skoczylas, *Analiza Matematyczna 2,* GIS 2007;
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Find the local extrema and intervals of monotonicity of the function f(x)=... 2. Find the area between the x-axis and the curves ... 3. Find the volume of the solid obtained by rotating about the x-axis, the region bounded by y=... 4. Evaluate partial derivatives of the given function 5. Evaluate the double integral over the given region	
Practical activites within the subject	Not applicable	

Document generated electronically. Does not require a seal or signature.