GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematics II, PG_00050294		
Field of study	Mechanical Engineering		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2021/2022
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study
Mode of study	Part-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	6.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Mathematics Center -> Vice-Rector for Education		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Leszek Ziemczonek	
	Teachers	dr Leszek Ziemczonek	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	30.0	0.0	0.0	0.0	60

E-learning hours included: 0.0

WIMiO - MiBM n.stac. - Matematyka II 2021/22 (L.Ziemczonek) - Moodle ID: 16486
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16486

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	60	9.0	81.0	150

Subject objectives

The aim of this subject is to obtain the students competence in the range of using the basic methods of mathematical analysis and linear algebra. Furthermore, the student is able to use this knowledge to solve simple theoretical and practical problems that can be found in the field of engineering.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U01] is able to acquire information from specialized literary sources, databases and other resources, essential for solving engineering tasks; is able to compile the obtained information pieces and to interpret them, additionally is able to form conclusions and present justified opinion	Student is able to process the acquired information, analyze and interpret it, draw conclusions and reason opinions.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject
[K6_W01] possesses mathematical knowledge within the range of linear algebra and mathematical analysis useful in characterising and interpreting mechanical systems, technological processes and operational properties of devices	Student recognizes the importance of skillful use of basic mathematical apparatus in terms of study in the future.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge

Subject contents	Antiderivative (primitive). The process of finding antiderivatives and integration formulas the substitution method of integration and integration by parts. Integration of rational, trigonometric and irrational functions. Newton-Leibniz Thorem. Integration formulas, the substitution method of integration and integration by parts for definite integrals. Improper integrals. Applications of integral calculus in computing areas of plane figures, lengths of arcs, volumes of solids of revolution. Functions of two variables. Partial derivatives. Differential of function. Extrema of function. Double integrals and their applications. Areas of flat regions. Volume of solids. Area of a piece of surface.
Prerequisites and co-requisites	Knowledge of differential calculus of one variable functions. Knowledge of matrix calculus.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
midterm colloquium	50.0%	50.0%
written exam	50.0%	50.0%

Recommended reading

Basic literature	1) Jankowska K., Jankowski T., Zbiór zadań z matematyki, Gdańsk, 2009. 2) Jankowska K., Jankowski T.: Funkcje wielu zmiennych, całki wielokrotne, geometria analityczna. Wyd. PG, Gdańsk, 2006. 3) Gewert M., Skoczylas Z., Analiza matematyczna 1. Przykłady i zadania, Wrocław, 2003. 4) Gewert M., Skoczylas Z.: Analiza matematyczna 2. Przykłady i zadania, Wrocław, 2003.
Supplementary literature	1) Krysicki W., Włodarski L., Analiza matematyczna w zadaniach. Cz. I, Warszawa, 1997. 2) Krysicki W., Włodarski L.: Analiza matematyczna w zadaniach. Cz. II, Warszawa, 1994. 3) Fichtenholz G. M.: Rachunek Różniczkowy i całkowy. PWN, Warszawa, 1995. 4) Leitner R.: Zarys matematyki wyższej dla studiów technicznych. WNT, Warszawa, 1994. 5) Żakowski W., Kołodziej W.: Matematyka cz. II. WNT, Warszawa, 1992.
eResources addresses	

Example issues/ example questions/ tasks being completed	1) Using the definite integral, determine the area of the area between the graphs of the curves ... 2) Find local extremes of functions of two variables ... 3) Use the double integral to calculate the volume of a solid bounded by areas ....
Work placement	Not applicable