GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematics III, PG_00040043		
Field of study	Mechanical Engineering, Mechanical Engineering		
Date of commencement of studies	October 2020	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	2	Language of instruction	Polish
Semester of study	3	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Mathematics Center -> Vice-Rector for Education		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Anita Dąbrowicz-Tlałka	
	Teachers	dr Anita Dąbrowicz-Tlałka	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	15.0	0.0	0.0	0.0	30

E-learning hours included: 0.0

Additional information:
The course is informative and supports the achievement of learning outcomes.

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	30	5.0	90.0	125

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_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.	[SW2] Assessment of knowledge contained in presentation
[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 combines knowledge of mathematics with knowledge from other fields.	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools

Subject contents	Triple integrals and their applications. Volume and mass of solids. Number series. Convergence tests of the number series. Complex numbers. Operations on complex numbers. Algebraic and trigonometric forms. Radicals of complex numbers. Ordinary differential equations: First order differential equations. General and particular solution. Separable variables and linear differential equations. Bernoulli differential equations. Second order linear differential equations with constant coefficients.
Prerequisites and co-requisites	Knowledge of differential and integral calculus of one variable functions. Knowledge of matrix calculus.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
class activity	0.0%	10.0%
midterm colloquium	0.0%	40.0%
written exam	50.0%	50.0%

Recommended reading

Basic literature	Jankowska K., Jankowski T.: Funkcje wielu zmiennych, całki wielokrotne, geometria analityczna. Wyd. PG, Gdańsk, 2006. Jankowska K., Jankowski T.: Zadania z matematyki wyższej. Wyd. PG, Gdańsk 2007. Gewert M., Skoczylas Z.: Analiza matematyczna 2. Oficyna Wydawnicza GiS, Wrocław, 2003. Krysicki W., Włodarski L.: Analiza matematyczna w zadaniach cz. II. PWN, Warszawa, 1994.
Supplementary literature	Fichtenholz G. M.: Rachunek Różniczkowy i całkowy. PWN, Warszawa, 1995. Leja F.: Rachunek różniczkowy i całkowy ze wstępem do równań różniczkowych. PWN, Warszawa, 1977. Leitner R.: Zarys matematyki wyższej dla studiów technicznych. WNT, Warszawa, 1994. Żakowski W., Kołodziej W.: Matematyka cz. II. WNT, Warszawa, 1992.
eResources addresses	

Example issues/ example questions/ tasks being completed	1. Use triple integral to calculate volume of solid bounded by surfaces: $x^2 + y^2 - 2z = 0$, $z = 2$. 2. Examine the convergence of a series of numbers ... 3. Find solutions to the equation ... in a set of complex numbers. 2. Solve differential equation $y'' - 5y' + 4y = 4x^2e^{2x}$.
Work placement	Not applicable