



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						
	Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18074 Adresy na platformie eNauczanie:						
	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	<p>Triple integrals and their applications. Volume and mass of solids.</p> <p>Number series. Convergence tests of the number series.</p> <p>Complex numbers. Operations on complex numbers. Algebraic and trigonometric forms. Radicals of complex numbers.</p> <p>Ordinary differential equations:</p> <p>First order differential equations. General and particular solution. Separable variables and linear differential equations. Bernoulli differential equations.</p> <p>Second order linear differential equations with constant coefficients.</p>		
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	<p>Jankowska K., Jankowski T.: Funkcje wielu zmiennych, całki wielokrotne, geometria analityczna. Wyd. PG, Gdańsk, 2006.</p> <p>Jankowska K., Jankowski T.: Zadania z matematyki wyższej. Wyd. PG, Gdańsk 2007.</p> <p>Gewert M., Skoczylas Z.: Analiza matematyczna 2. Oficyna Wydawnicza GiS, Wrocław, 2003.</p> <p>Krysicki W., Włodarski L.: Analiza matematyczna w zadaniach cz. II. PWN, Warszawa, 1994.</p>	
	Supplementary literature	<p>Fichtenholz G. M.: Rachunek Różniczkowy i całkowy. PWN, Warszawa, 1995.</p> <p>Leja F.: Rachunek różniczkowy i całkowy ze wstępem do równań różniczkowych. PWN, Warszawa, 1977.</p> <p>Leitner R.: Zarys matematyki wyższej dla studiów technicznych. WNT, Warszawa, 1994.</p> <p>Żakowski W., Kołodziej W.: Matematyka cz. II. WNT, Warszawa, 1992.</p>	
	eResources addresses		

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