



Subject card

Subject name and code	Mathematics III, PG_00039390						
Field of study	Medical and Mechanical Engineering, Medical and 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	Full-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			exam		
Conducting unit	Mathematics Center -> Vice-Rector for Education						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Magdalena Łapińska				
	Teachers		dr inż. Magdalena Łapińska mgr Katarzyna Kiepiela				
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						
WIMiO - IMM sem.3 - Matematyka 3 2021/22 (M.Łapińska) - Moodle ID: 16403 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16403							
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	10.0	70.0	125		
Subject objectives	The aim of this subject is to obtain the student's competence in the range of using the basic methods of mathematical analysis, ordinary differential equations, partial differential equations and probability theory. 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		Student demonstrates some techniques for solving ordinary differential equations. Students finds the right method for solving the second - order differential equations. Student determines general and particular solutions of higher orders linear differential equations with constant coefficients. Student determines general and particular solutions of systems of differential linear equations. Student demonstrates some chosen techniques of solving ordinary differential equations using Laplace transform. Student determines general and particular solutions of a first-order partial linear differential equations.		[SW1] Assessment of factual knowledge		
	K6_U01		The student is able to solve the problem in the field of mechanical and medical engineering using the acquired knowledge, but also professional literature.		[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
	K6_U05		The student is able to use selected analytical and numerical methods of solving ordinary differential equations to solve engineering tasks in the field of mechanical and medical engineering.		[SU2] Assessment of ability to analyse information		

Subject contents	Triple integrals. First order ordinary linear equation. Second order linear differential equations with constant coefficients. Fundamental set of solution of the homogeneous linear differential equation. Non-homogeneous linear differential equations. Higher order linear differential equations with constant coefficients. Systems of differential equations. Laplace transform. Partial linear differential equations of first order. The Cauchy initial value problem. Partial differential equations of second order. Probability space, one-dimensional random variable continuous and discrete, density function, distribution, expected value and variance of a random variable. Basic distribution of random variable.		
Prerequisites and co-requisites	Knowledge of the subject Mathematics 1 and 2.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
Recommended reading	Basic literature	Matwiejew M.M. Metody całkowania równań różniczkowych zwyczajnych PWN, Warszawa 1982, W. Kryszicki, L. Włodarski Analiza matematyczna w zadaniach cz II PWN, Warszawa 1986, Jankowska K, Jankowski T, Zadania z matematyki wyższej PG Gdańsk 2007, Niedoba J, Niedoba W, Równania różniczkowe zwyczajne i cząstkowe pod redakcją B.Choczewskiego AGH 2001. Kryszicki W, Bartos J, Dyczka W, Królikowska K, Wasilewski M. Rachunek prawdopodobieństwa i statystyka matematyczna w zadaniach PWN Warszawa 1989.	
	Supplementary literature	Kački E. Siewierski L. Wybrane działy matematyki wyższej z ćwiczeniami, PWN Warszawa 1975, Muszyński J, Myszkis A.D. Równania różniczkowe zwyczajne PWN Warszawa 1984, Gerstenkorn T. Śródka T. Kombinatoryka i rachunek prawdopodobieństwa PWN Warszawa 1983.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 1. Find a general solution of differential equations. 2. Find a particular solution satisfying the given initial conditions of the differential equations. 3. Solve a system of differential equations. 		
Work placement	Not applicable		