

关。GDAŃSK UNIVERSITY 创 OF TECHNOLOGY

Subject card

Subject name and code	Differential equations II, PG_00021047							
Field of study	Mathematics							
Date of commencement of studies	October 2022		Academic year of realisation of subject			2022/2023		
Education level	second-cycle studies		Subject group			Optional subject group Subject group related to scientific research in the field of study		
Mode of study	Full-time studies		Mode of delivery			blended-learning		
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	Department of Differential Equations and Mathematical Applications -> Faculty of Applied Physics and Mathematics							ics and
Name and surname	Subject supervisor		dr Agnieszka	Bartłomiejczyk				
of lecturer (lecturers)	Teachers		dr Agnieszka Bartłomiejczyk					
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM
of instruction	Number of study hours	45.0	30.0	0.0	0.0		0.0	75
	E-learning hours included: 3.0							
Learning activity and number of study hours	Learning activity	ty Participation in dida classes included in plan		Participation in consultation hours		Self-study		SUM
	Number of study 75 hours		5.0		70.0 150		150	
Subject objectives	Acquiring basic knowledge of qualitative theory of differential equations and differential-functional equations. Consolidating and developing the ability to solve ordinary differential equations.							
Learning outcomes	Course out	come	Subj	ect outcome		Method of verification		
	к7_009		Students can study the stability of steady states and are able to solve simple differential inequality.			[SU4] Assessment of ability to use methods and tools		
	K7_U04		Students can find the right method for solving ordinary differential equations.			[SU4] Assessment of ability to use methods and tools		
	K7_W10		Students know approximate method for solving differential equations.			[SW1] Assessment of factual knowledge		
	K7_W01		The student has knowledge of the theory of ordinary differential equations.			[SW1] Assessment of factual knowledge		
	K7_K02		Students understand the need to popularize the application of differential equations in fields such as physics, biology, medicine and economics.		[SK4] Assessment of communication skills, including language correctness [SK1] Assessment of group work skills			
Subject contents	 Elements of the theory of stability: the Lyapunov stability, stability of constant coefficient linear system, stability of solutions of n order linear equations, stability of solutions of nonlinear systems, the Lyapunov function, other types of stability. Boundary value problems: linear boundary value problem, the Green function for ODEs, properties of solutions of second-order linear differential equations, the Sturm comparative theorem, the Sturm-Liouville problem 							
	 The Laplace transform: basic properties of the Laplace transform, Inverse Laplace transform. Solving linear ordinary differential systems and differential-integral equatiosn using Laplace transform. 							
Prerequisites and co-requisites	The knowledge of Mathematical Analysis, Differential Equations I							

Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade			
and criteria	talk	20.0%	10.0%			
	tests	50.0%	60.0%			
	exam	50.0%	30.0%			
Recommended reading	Basic literature	 Z. Kamont, Równania różniczkowe zwyczajne, Wydawnictwo Uniwersytetu Gdańskiego, 1999 A. Pelczar, J. Szarski, Wstęp do teorii równań różniczkowych, PWN, 1984 W. Walter, Ordinary differential equations, Springer, 1988 				
	Supplementary literature	 B.P. Demidowicz, Matematyczna teoria stabilności, WNT, 1972. J. Muszyński, A.D. Myszkis, Równania różniczkowe zwyczajne, PWN, 1984 				
	eResources addresses	Adresy na platformie eNauczanie: Równania różniczkowe II 2022/2023 - Moodle ID: 27426 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=27426				
Example issues/ example questions/ tasks being completed	Give the definition of stability in the sense of Lyapunov. Sketch and interpret the phase portret for autonomous linear constant coefficient systems. Solve linear ordinary differential equations using Laplace transform.					
Work placement	Not applicable					