



Subject card

Subject name and code	Differential equations in Physics and Technology, PG_00037294						
Field of study	Technical Physics						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2025/2026		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study Subject group related to scientific research 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			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Atomic, Molecular and Optical Physics -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Maciej Demianowicz					
	Teachers						
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						
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	4.0	36.0	100		
Subject objectives	Students become acquainted with methods of solving most popular differential equations encountered in physics and technics.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W03] has systematized knowledge of higher mathematics, including algebra, analysis, probability theory and numerical methods, allowing for basic description, understanding and modelling of physical phenomena and some technical processes	The student has a deep and structured knowledge in the field of the theory of differential equations and knows how to apply it to physics and technology.			[SW1] Assessment of factual knowledge		
	[K6_W02] has systematized knowledge of the basics of physics, including mechanics, thermodynamics, electricity and magnetism, optics, atomic and particle physics, solid-state physics, nuclear and elementary particle physics	The student has a deep and structured knowledge in the field of the theory of differential equations and knows how to apply it to physics and technology.			[SW1] Assessment of factual knowledge		
	[K6_U02] analyzes and solves simple scientific and technical problems, based on possessed knowledge, using analytical, numerical, simulation and experimental methods	The student is able to solve scientific and technical problems requiring the ability to solve (mainly analytically) differential equations			[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information		
Subject contents	1. First-order ordinary differential equations. 2. Second-order ordinary linear differential equations. 3. Systems of first-order ordinary linear differential equations.						

Prerequisites and co-requisites	Good knowledge of mathematical analysis.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Grade	50.0%	100.0%
Recommended reading	Basic literature	1. N. M. Matwiejew, Metody całkowania równań różniczkowych zwyczajnych, PWN, Warszawa, 1970 2. W. W. Stiepanow, Równania różniczkowe, PWN, Warszawa, 1956	
	Supplementary literature	None.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	1. Present properties of the Wronskian of solutions of the second-order linear differential equations. 2. Present the method of generalized power series.		
Work placement	Not applicable		

Document generated electronically. Does not require a seal or signature.