



Subject card

Subject name and code	Mathematical methods of physics , PG_00027637						
Field of study	Mathematics						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2027/2028		
Education level	first-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		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	6		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Department Of Probability Theory And Biomathematics -> Faculty Of Applied Physics And Mathematics -> Wydziały Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Paweł Wojda				
	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						
	Adresy na platformie eNauczanie:						
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		5.0		35.0	100
Subject objectives	To familiarize the student with with the mathematical methods used in physics						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_K01		knows the limits of his own knowledge and understands the need for further education		[SK2] Assessment of progress of work		
	K6_U05		Student applies theorems and methods of differential calculus of functions of one and several variables		[SU4] Assessment of ability to use methods and tools		
	K6_W03		Student understands the construction of mathematical theories, mathematical formalism can be used to construct and analyze simple mathematical models in other sciences		[SW2] Assessment of knowledge contained in presentation		
	K6_U08		Student knows how to calculate determinants and knows their property; can give a geometric interpretation of the determinant and understands its relationship with the mathematical analysis		[SU1] Assessment of task fulfilment		
	K6_K02		Students understand the need to popularize the application of differential equations in fields such as physics.		[SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice		
Subject contents	1. Calculation of selected integrals useful in physics. 2. Mathematical description of physical phenomena: mathematical pendulum, free vibrations and suppressed harmonic oscillator, motion of a material point. 3. Fourier transform and Fourier series. 4. Formulating the initial-boundary problems of mathematical physics: mass diffusion, electric current conduction, wave phenomena. 5. Elements of tensor calculus.						

Prerequisites and co-requisites	Differential equations I Partial differential equations		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	exam	50.0%	40.0%
	tests	50.0%	60.0%
Recommended reading	Basic literature	1. J. Rybicki: Metody matematyczne fizyki, Politechnika Gdańska, 1987. 2. A. Zagórski: Metody matematyczne fizyki, Oficyna Wydawnicza Politechniki Warszawskiej, 2014. 3. A.N.Tichonow, A.A.Samarski: Równania fizyki matematycznej, PWN 1963.	
	Supplementary literature	1. F.W. Byron, R.W. Fuller: Matematyka w fizyce klasycznej i kwantowej. PWN,1975. 2. W.A. Majewski: Metody Matematyczne Fizyki I. skrypt Uniwersytet Gdański, 1990. 3. E. Karaśkiewicz: Zarys teorii wektorów i tensorów. PWN, 1964.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	What are the free vibrations of the harmonic oscillator?		
Work placement	Not applicable		

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