

GDAŃSK UNIVERSITY

Subject card

Subject name and code	, PG_00051069								
Field of study	Technical Physics								
Date of commencement of studies	October 2021		Academic year of realisation of subject			2022/2023			
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	2		Language of instruction			Polish			
Semester of study	4		ECTS credits			5.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Department of Atomic	c, Molecular an	d Optical Physi	ics -> Faculty o	of Applie	ed Phys	ics and Mathe	matics	
Name and surname	Subject supervisor		dr inż. Paweł						
of lecturer (lecturers)	Teachers		dr inż. Paweł Wojda						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
	Number of study hours	15.0	0.0	30.0	0.0		0.0	45	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity	ning activity Participation ir classes includ plan		Jidactic Participation in J in study consultation hours		Self-study		SUM	
	Number of study hours	45		5.0				125	
Subject objectives	The aim of the course is to educate the student a coherent view on the basic issues of physics / mathematics / techniques and tools to solve these problems.								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	K6_U02		The student refers to the knowledge gained during the studies in physics / mathematics and uses IT tools.			[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools			
	K6_W05		The student knows the basics of programming, computing, data reading and data processing.			[SW1] Assessment of factual knowledge			
	K6_U03		Student uses symbolic calculations and uses basic commands, such as loops, in C ++			[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment			
	K6_W03		The student is able to explain the solution of a problem in physics or mathematics.			[SW1] Assessment of factual knowledge			

Subject contents	Introduction.Symbolic computation program (Mathematica, Maple, etc).						
	Mathematical Modelling. General mathematical notions and symbols.						
	Algebraic manipulations. Algorithm. Programs.						
	Polynomials, intertwine relations. Integral and difference operators factorization.						
	Differential operators factorization. Differential equations solution. Eigenvectors.						
	Algorithm for the tridiagonal matrix (Thomas algorithm).						
	Numerical and analytical solution of ordinary differential equations and partial differential equations.						
	Mathematical description of physical phenomena.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade				
	passing laboratories	50.0%	70.0%				
	passing tests	50.0%	30.0%				
Recommended reading	Basic literature	1. D. Kincaid, W. Cheney, Numerical analisys					
		2. Mathematica. Wolfram Research. <u>https://www.wolfram.com/</u> mathematica/online/					
	Supplementary literature Symbolic calculation algorithms. S. Leble. Script in Polish						
	eResources addresses	Adresy na platformie eNauczanie:					
	Obliczenia symboliczne w fizyce 2022/2023 - Moodle ID: 27461 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=27461						
Example issues/ example questions/ tasks being completed	Determine eigenvectors, eigenvalues of the matrix. Determine the solutions of the system of first order differential equations. Description of sound propagation.						
Work placement	Not applicable						