

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematical software, PG_00036611								
Field of study	Mathematics								
Date of commencement of studies	October 2023		Academic year of realisation of subject			2024/2025			
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 Laboratory instructions in English are available.			
Semester of study	3		ECTS credits			4.0			
Learning profile	general academic profile		Assessmer	Assessment form			assessment		
Conducting unit	Divison of Nonlinear Analysis -> Institute of Applied Mathematics -> Faculty of Applied Physics and Mathematics								
Name and surname	Subject supervisor	dr inż. Magdalena Chmara							
of lecturer (lecturers)	Teachers		dr inż. Magdalena Chmara						
			dr hab. Sergey Kryzhevich						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	utorial Laboratory Projec		t	Seminar	SUM	
	Number of study hours	15.0	0.0	30.0	0.0		0.0	45	
	E-learning nours included: 0.0								
	Adresy na platformie eNauczanie: Pakiety Matematyczne WFTiMS 2024/25 - Moodle ID: 40280 https://enauczanie.pg.edu.pl/moodle/course/ view.php?id=40280								
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		5.0		50.0		100	
Subject objectives	 The aim of the course are: to acquaint the student with the program Mathematica and Matlab environment to develop basic skills development in both environments presentation of the possibility of applying learned skills in solving mathematical problems 								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	K6_U07		Students learn various computational procedures supplied with programs and create their own procedures. They solve mathematical problems and issues using programming skills.			[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment			
	K6_W09		Students use Mathematica, Matlab and R. They perform symbolic and numerical calculations and use programming elements.			[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge			

Subject contents	Introduction to Mathematica: a description of the work environment, the kernel of the program, data entry. Numbers and variables: types of numbers, the approximate number systems, mathematical constants, arithmetic operations, defining variables, the accuracy of the calculations, logical operators, comparison operators. Lists and tables: create lists and basic operations on lists, modification tables with the help of built- in functions. Elements of Programming: conditional statements, iterative loops, defining procedures. Vectors and Matrices: Basic operations on vectors and matrices, solving systems of linear equations. Elements of mathematical analysis: action on polynomials, the definition of functions, solving equations and systems of nonlinear equations, differentiation and integration of functions. Introduction to Matlab environment: a description of the work environment, the kernel of the program, the use of assistance, data entry, the M- script files. Elements of Programming: conditional statements, iterative loops, defining procedures, M- files function, pointers to functions, anonymous functions. Presentation of data: data types, variables display format, write data to the screen and to a file, reading data from a file, graphical presentation. Issues of linear algebra. The package for symbolic computation . Introduction to the R language and the RStudio environment: data types, operations on datasets and files.						
Prerequisites and co-requisites	There are no prerequisites, the student learns the programs from scratch.						
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade				
	Project	50.0%	20.0%				
	Lecture Task	50.0%	10.0%				
	Tasks in the classroom	50.0%	20.0%				
	2 Semestral tests	50.0%	50.0%				
Recommended reading	Basic literature	 Mathematica documentation http://reference.wolfram.com/legacy/v5/ TheMathematicaBook/index.html Matlab documentation https://www.mathworks.com/help/matlab/ R documentation 					
	Supplementary literature	none					
	eResources addresses	Podstawowe					
		https://www.rdocumentation.org/ - R documentation					
		https://www.mathworks.com/help/matlab/ - Matlab documentation					
		http://reference.wolfram.com/legacy/v5/TheMathematicaBook/ index.html - Mathematica documentation					
		Pakiety Matematyczne WFTiMS 2024/25 - Moodle ID: 40280 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=40280					
Example issues/	SUES/ The task of the student will be writing programs solving mathematical problems, such as						
example questions/ tasks being completed	1 Write a program defining the Fibonacci sequence;						
0 1	2 Write a program resolving the differential problem.						
Work placement	Not applicable						

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