



## Subject card

Subject name and code	Mathematical software, PG_00036611						
Field of study	Mathematics						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2022/2023		
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 Nonlinear Analysis and Statistics -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Magdalena Chmara				
	Teachers		dr inż. Magdalena Chmara dr Adrian Myszkowski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	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	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 is to acquaint the student with the program Mathematica, Matlab environment. 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		The student learns a number of computational procedures provided with the programs and creates its own procedures. Resolves mathematical problems and issues using programming skills.		[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		
	K6_W09		The student uses such programmes as Mathematica and Matlab.		[SW1] Assessment of factual knowledge		
Subject contents	<p>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.</p> <p>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 .</p>						
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
	Activity	0.0%	10.0%
	Semestral tests	50.0%	60.0%
	Project	50.0%	30.0%
Recommended reading	Basic literature	1. Mathematica documentation <a href="http://reference.wolfram.com/legacy/v5/TheMathematicaBook/index.html">http://reference.wolfram.com/legacy/v5/TheMathematicaBook/index.html</a>	
	Supplementary literature	none	
	eResources addresses	Adresy na platformie eNauczanie: Pakiety Matematyczne WFTiMS 2022/23 - Moodle ID: 25030 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25030">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25030</a>	
Example issues/ example questions/ tasks being completed	The task of the student will be writing programs solving mathematical problems, such as  1 Write a program defining the Fibonacci sequence;  2 Write a program resolving the differential problem.		
Work placement	Not applicable		