

Subject card

Subject name and code	Mathematical Software, PG_00155276						
Field of study	Mathematical Modeling and Data Analysis						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2026/2027		
Education level	Bachelor's studies		Subject group		Obligatory subject group 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 The course may be conducted in English.		
Semester of study	3		ECTS credits		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Institute of Mathematics -> Faculty of Mathematics, Physics and Informatics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Michał Banacki				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	0.0	0.0	30
	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	30		5.0		15.0	50
Subject objectives	• Introduction to using math packages. • Using math packages to solve math problems.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[MMiADL3_W10] knows and understands at least one software package for symbolic calculations		The student knows at a basic level at least one mathematical software package.		[SW5] implementation of a problem task		
	[MMiADL3_K03] is ready to work in a team; understands the need for systematic work on all projects that have a long-term character		The student is able to work in a team and understands the importance of a systematic approach in working on mathematical problems.		[SK2] presentation/project/paper/report [SK8] observation of student's independent or team work		
	[MMiADL3_W09] knows and understands the basics of computational and programming techniques supporting mathematician's work and understands their limitations		The student knows the basics of computational and programming techniques associated with a given mathematical software package and is aware of their limitations.		[SW5] implementation of a problem task		
	[MMiADL3_U09] is able to use the learned software package or the learned programming language to solve selected problems from the known fields, in particular from mathematical analysis, linear algebra and statistics		The student is able to use the known software package or programming language to solve selected problems in the known fields of mathematics.		[SU2] presentation/project/paper/report [SU5] implementation of a problem task		
Subject contents	1. Presentation of a CAS package selected by the lecturer (e.g. Maxima, Mathematica, SageMath). 2. Discuss the limitations of this type of software packages. 3. Using software to solve selected mathematical problems (related to e.g. mathematical analysis and linear algebra) requiring the use of a computer. 4. Using programming techniques to solve mathematical problems. 5. Presentation of subject-related nomenclature in English.						

Prerequisites and co-requisites	Basic knowledge of calculus, linear algebra and programming obtained in the first year of studies.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	observation of the student's attitude	51.0%	0.0%
	tests and/or project	51.0%	100.0%
Recommended reading	Basic literature	User manuals for software packages selected by the instructor.	
	Supplementary literature	1. P. Zimmermann et al., Computational Mathematics with SageMath, Society for Industrial and Applied Mathematics, 2018. 2. G. V. Bard, Sage for Undergraduates, American Mathematical Society, 2015.	
	eResources addresses	Supplementary https://doc.sagemath.org/html/en/index.html - SageMath package documentation.	
Example issues/ example questions/ tasks being completed	None		
Work placement	Not applicable		

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