

Subject card

Subject name and code	Software for Mathematics Education, PG_00204266						
Field of study	Mathematics						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2028/2029		
Education level	Bachelor's studies	Subject group			Obligatory subject group in the field of study Optional subject group		
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			5.0		
Learning profile	academic	Assessment form			exam		
Conducting unit	Institute of Mathematics -> Faculty of Mathematics, Physics and Informatics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Adrian Karpowicz				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	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	60		3.0		62.0	125
Subject objectives	The aim of the classes is to familiarize students with selected programs supporting mathematics teaching and to prepare them to conduct lessons and other activities using educational programs such as GeoGebra, Scratch and Python.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[MATL3_U08] is able to use a known software package or a known programming language to solve selected problems in the learned fields		Is able to apply the learned programs in the process of solving mathematical tasks at various educational levels Can write simple procedures in known programs that allow to illustrate selected concepts and mathematical theorems			[SU2] presentation/project/paper/report [SU5] implementation of a problem task	
	[MATL3_W09] knows and understands at an advanced level at least one software package used for symbolic or numerical calculations		Knows at least two software packages for symbolic calculations, for learning programming and for geometry Knows the theoretical foundations of computational methods and IT techniques used to solve mathematical problems in the known software packages			[SW4] test/exam - oral or written [SW5] implementation of a problem task	

Subject contents	<p>1. Application of DGS (e.g. GeoGebra program) in the field of learning and teaching mathematics in primary, secondary and higher schools. In particular: creating dynamic presentations of definitions, theorems and mathematical proofs, formulating mathematical hypotheses and their justification and generalization, creating geometric structures, solving tasks in an experimental (dynamic) way in the field of geometry, algebra and mathematical analysis and developing their mathematical solutions, creating animations and computer simulations, 2. Using programming languages (e.g. Scratch or Python) and spreadsheets in learning and teaching mathematics in primary, secondary and higher education. Especially for algorithmizing simple mathematical problems and presenting mathematical content, to study the properties of natural numbers (including comparison of different algorithms solving the same problem), for solving selected probabilistic and statistical problems and data analysis. 3. The use of selected multimedia content in learning and teaching mathematics, e.g. Corinth applications, selected Khan Academy resources. 4. The use of artificial intelligence tools in learning and teaching mathematics.</p>																				
Prerequisites and co-requisites																					
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="456 647 786 674">Subject passing criteria</th> <th data-bbox="799 647 1139 674">Passing threshold</th> <th data-bbox="1152 647 1482 674">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 680 786 707">projects</td> <td data-bbox="799 680 1139 707">51.0%</td> <td data-bbox="1152 680 1482 707">20.0%</td> </tr> <tr> <td data-bbox="456 714 786 741">test</td> <td data-bbox="799 714 1139 741">51.0%</td> <td data-bbox="1152 714 1482 741">35.0%</td> </tr> <tr> <td data-bbox="456 748 786 775">problem test</td> <td data-bbox="799 748 1139 775">51.0%</td> <td data-bbox="1152 748 1482 775">35.0%</td> </tr> <tr> <td data-bbox="456 781 786 831">observation of the student's attitude</td> <td data-bbox="799 781 1139 831">51.0%</td> <td data-bbox="1152 781 1482 831">0.0%</td> </tr> <tr> <td data-bbox="456 837 786 864">activity</td> <td data-bbox="799 837 1139 864">51.0%</td> <td data-bbox="1152 837 1482 864">10.0%</td> </tr> </tbody> </table>	Subject passing criteria	Passing threshold	Percentage of the final grade	projects	51.0%	20.0%	test	51.0%	35.0%	problem test	51.0%	35.0%	observation of the student's attitude	51.0%	0.0%	activity	51.0%	10.0%		
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Recommended reading	<p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>	<p>Winkowska Nowak Katarzyna , Pobiega Edyta i in. ABC GeoGebry . Poradnik dla początkujących, OEKP, 2016. Farrell Peter, Matematyczne przygody z Pythonem, PWN, 2021</p> <p>none</p>																			
Example issues/ example questions/ tasks being completed	none																				
Work placement	Not applicable																				

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