

Subject card

Subject name and code	Mathematics - lecture, PG_00194261						
Field of study	Geography						
Date of commencement of studies	October 2026	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	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			2.0		
Learning profile	academic	Assessment form			credit		
Conducting unit	Division of Geometry -> Institute of Mathematics -> Faculty of Mathematics, Physics and Informatics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Paweł Klinga				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	20.0	0.0	0.0	0.0	0.0	20
	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	20		2.0		28.0	50
Subject objectives	To familiarize students with the elements of mathematical analysis and linear algebra, which can be used in the methods of description of research objects, phenomena and processes in the field of geographical sciences. To develop in students the ability to understand problems abstractly.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[GEOGRL3-W06] knows advanced methods of acquiring, processing, and compiling geographic environmental data, as well as methods of analyzing and interpreting such data		The student selects advanced mathematics techniques to the extent necessary for understanding and describing processes and phenomena occurring in the Earth's natural environment.			[SW4] test/exam - oral or written	
	[GEOGRL3-W02] knows and understands key concepts and theories in geography, as well as advanced processes and phenomena related to spatial diversity and the distribution of processes and phenomena on the Earth's surface at various spatial scales, particularly in Poland		The student applies mathematical methods to analyze, model, and interpret geographical processes and phenomena, particularly those concerning spatial differentiation and distribution across various scales.			[SW4] test/exam - oral or written	
	[GEOGRL3-K02] is prepared to bear full responsibility for the actions taken and adhere to the principles of professional ethics and principles of intellectual honesty, is aware of the importance of a professional approach in professional life		The student demonstrates responsibility for the accuracy of performed analyses and mathematical calculations and adheres to the principles of intellectual integrity, particularly with regard to independent work and the reliable interpretation of results.			[SK4] test/exam - oral or written	

Subject contents	Notation, mathematical symbols.		
	Elements of trigonometry.		
	Elements of vector and matrix calculus.		
	Examples of methods for solving systems of equations.		
	Elements of differential calculus.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test	51.0%	100.0%
Recommended reading	Basic literature	T. Jurliewicz, Z. Skoczylas, Algebra liniowa 1. Przykłady i zadania M. Gewert, Z. Skoczylas, Analiza matematyczna 1. Przykłady i zadania G. Kwiecińska: Matematyka : kurs akademicki dla studentów nauk stosowanych. Cz. 1, Wybrane zagadnienia algebry liniowej G. Kwiecińska: Matematyka : kurs akademicki dla studentów nauk stosowanych. Cz. 2, Analiza funkcji jednej zmiennej W. Krywicki, L. Włodarski: Analiza matematyczna w zadaniach. 1	
	Supplementary literature	W. Oktała, E. Niedokos: Matematyka i podstawy statystyki matematycznej Marian Gewert, Zbigniew Skoczylas: Analiza matematyczna 1: definicje, twierdzenia, wzory Teresa Jurliewicz, Zbigniew Skoczylas: Algebra liniowa 1: definicje, twierdzenia, wzory	
	eResources addresses		
Example issues/ example questions/ tasks being completed	What is the limit of a function		
	What is the derivative of a function		
Work placement	Not applicable		

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