University of Gdańsk

Subject card

Subject name and code	Mathematics - lecture, PG_00191247						
Field of study	Geology						
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	3.0			
Learning profile	academic		Assessment form	exam			
Conducting unit	Division of Geometry -> Institute of Mathematics -> Faculty of Mathematics, Physics and Informatics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Michał Jabłonowski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	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		1.0	44.0	75	
Subject objectives	The lecture aims to present the knowledge, skills and mathematical competencies necessary in the further education process in a given field.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[GEOLL3_W06] knows statistical and IT tools as well as the principles of preparing engineering and geological documentation and cartographic materials	The student is able to link a problem in the field of algebra and mathematical analysis and their applications with an appropriate theoretical problem.	[SW4] test/exam - oral or written
[GEOLL3_W02] knows and understands the terminology appropriate in science and natural sciences	The student has extended and deepened knowledge of mathematics useful for formulating and solving tasks/problems appropriate in exact and natural sciences, in particular: • knows basic mathematical symbols, transformations of algebraic expressions, • understands the adopted assumptions, definitions and previously derived results and theorems, • classifies basic elementary functions and lists their properties, • lists the basic formulas of differential and integral calculus, • lists the basic formulas of matrix calculus.	[SW4] test/exam - oral or written
[GEOLL3_U04] is able to use specialized computer software and mathematical and statistical methods in the analysis of geological data	The student is able to use mathematical methods to analyze numerical data, in particular: • expresses the meaning of selected mathematical symbols, transforms algebraic expressions, • uses basic differential and integral calculus formulas to solve problems, • uses the basic formulas of linear algebra, • justifies his/her conclusions using correct mathematical language.	[SU4] test/exam - oral or written

Subject contents

- Properties of functions, including: domain, graph, one-to-one, monotonicity, zero.
- Elementary functions, their graphs and properties, including: polynomial, rational, power, exponential, logarithmic and trigonometric.
- Limits and continuity of functions. Tangent to graphs and differentiability of functions.
- Determining the derivative and its applications. Local extremes and the study of variability of functions.
- Indefinite integral and methods of its determination.
- Definite integral and its applications.
- Basic differential equations.
- Complex numbers and their interpretation in the plane.
- Matrix calculus, systems of equations and determinants.
- Point, line, plane and vector in space. Basic operations in analytical geometry.
- Functions of two real variables. Partial derivatives, gradient and their applications.

Prerequisites and co-requisites

A. Formal requirements:

Lack

B. Entrance requirements:

High-school mathematics

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
exam	51.0%	100.0%

Recommended reading

Basic literature

- 1. Włodarski W., Krysicki L., Analiza matematyczna w zadaniach, Część I i II, Wyd. Naukowe PWN.
- 2. Gewert M., Skoczylas Z., Analiza matematyczna ; definicje, twierdzenia, wzory. Wyd. GiS
- 3. Gewert M., Skoczylas Z., Analiza matematyczna ; przykłady i zadania. Wyd GiS
- 4. Jurlewicz T., Skoczylas Z., Algebra liniowa ; definicje, twierdzenia, wzory. Wyd. GiS
- 5. Jurlewicz T., Skoczylas Z., Algebra liniowa ; przykłady i zadania, Wyd. GiS

	Supplementary literature	• 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
	eResources addresses	
Example issues/ example questions/ tasks being completed	• Determining the derivative and its applications. Local extremes and the study of variability of functions. • Definite integral and its applications. • Matrix calculus, systems of equations and determinants.	
Work placement	Not applicable	

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