

Subject card

Subject name and code	Mathematics I, PG_00178472						
Field of study	Informatics and Econometrics						
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	part-time studies	Mode of delivery				at the university	
Year of study	1	Language of instruction				Polish	
Semester of study	1	ECTS credits				6.0	
Learning profile	academic	Assessment form				credit	
Conducting unit	Department of Statistics -> Faculty of Management -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Beata Jackowska				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	16.0	16.0	0.0	0.0	0.0	32
	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	32		2.0		116.0	150
Subject objectives	Equalizing the level of students' knowledge, and then developing the knowledge of mathematical methods necessary for further education. To learn about the possibilities of applying mathematical methods in economics.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[[liEL3_W02] To an advanced degree, the student knows and understands selected theoretical and practical issues in informatics, statistics or econometrics necessary for understanding economic and social phenomena.		The student knows and understands the methods of linear algebra and mathematical analysis necessary for further education in all fields of study at the Faculty of Management of the University of Gdańsk. The student knows the possibilities of applying mathematical methods in economics.			[SW4] test/exam - oral or written [SW3] text preparation/written work	
[[liEL3_U02] Students can select or construct econometrics, informatics or statistics tools and apply them to describe and solve economic and social problems.		The student is able to present selected economic issues in the matrix form and perform basic operations on these matrices. The student can use differential calculus and integral calculus in selected economic issues.			[SU3] text preparation/written work [SU4] test/exam - oral or written		

Subject contents	<p>Elements of linear algebra</p> <ol style="list-style-type: none"> 1. Matrices: the term of matrix, types of matrices, matrix operations and their properties, determinant of a square matrix and its properties, elementary operations on a matrix, computing an inverse matrix. Examples of matrices in economic problems. 2. Systems of linear equations: matrix form of a system of linear equations, solving systems of linear equations. Examples of systems of linear equations in economic problems. <p>Elements of mathematical analysis</p> <ol style="list-style-type: none"> 1. The numerical sequences: monotonicity, arithmetic and geometric sequences, limits of sequences, convergent and divergent sequences, convergent sequences up to the number e. Sequences of payments in financial mathematics. 2. Functions of the one variable: definition of a function, the function limit, continuity of a function. Examples of functional relationships in economics. 3. Differentiation of function of the one variable: difference quotient, derivative of function at a point, geometric interpretation of the derivative, properties of the derivative, Lagrange's theorem, derivatives of the higher order, de L'Hospital's rule. 4. The use of derivatives to study the properties of functions: monotonicity and the sign of the derivative, a necessary and sufficient condition for the existence of a local extremum, the greatest and the smallest value of a function. Examples of the use of differential calculus in economics. 5. Functions of several variables: the function limit, continuity of a function, partial derivatives, local extrema, conditional extrema, the greatest and the smallest value of a function. Examples in economics. 6. Integral calculus: indefinite integral, properties of indefinite integral, methods of integration: integration by parts and integration by substitution, definite integral, geometric interpretation of definite integral, properties of definite integral, calculation of areas bounded by curves, improper integrals. Examples of the use of integral calculus in economics. 											
Prerequisites and co-requisites	The student should have basic mathematical knowledge of secondary school.											
Assessment methods and criteria	<table border="1" data-bbox="448 831 1487 949"> <thead> <tr> <th data-bbox="448 831 798 864">Subject passing criteria</th> <th data-bbox="802 831 1142 864">Passing threshold</th> <th data-bbox="1147 831 1487 864">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 871 798 949">Assessment on the basis of two written colloquia covering solving exercises from tutorial and lecture.</td> <td data-bbox="802 871 1142 949">51.0%</td> <td data-bbox="1147 871 1487 949">100.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Assessment on the basis of two written colloquia covering solving exercises from tutorial and lecture.	51.0%	100.0%			
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Example issues/ example questions/ tasks being completed												
Work placement	Not applicable											

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