

Subject card

Subject name and code	Mathematics I, PG_00178047						
Field of study	Informatics and Econometrics						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
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		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		mgr Katarzyna Raca mgr Karolina Diakowska dr Agnieszka Pobłocka dr Anna Gierusz-Matkowska dr Lech Kujawski				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	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		4.0		86.0	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		
	[IiEL3_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		
	[IiEL3_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		

Subject contents	Elements of linear algebra 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. Elements of mathematical analysis 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><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Assessment on the basis of two written colloquia covering solving exercises from tutorial and lecture.</td><td>51.0%</td><td>100.0%</td></tr></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%		
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%							
Recommended reading	Basic literature	1. Bazańska T., Nykowska M., <i>Matematyka w zadaniach dla wyższych zawodowych uczelni ekonomicznych</i>, Wydawnictwo Branta 2003 2. Matłoka M. (red), <i>Matematyka dla ekonomistów</i>, Wydawnictwo AE w Poznaniu, Poznań 2000 3. Sadowski M, Spanily T., <i>Matematyka w zadaniach dla studentów kierunków ekonomicznych</i>, Wydawnictwo UG, Gdańsk, 1999							
	Supplementary literature	1. Bednarski T., <i>Elementy matematyki w naukach ekonomicznych</i>, Oficyna Ekonomiczna, Kraków 2004 2. Chiang A. C., <i>Podstawy ekonomii matematycznej</i>, PWN, Warszawa 1994 3. Krywicki W., Włodarski L., <i>Analiza matematyczna w zadaniach</i>, część I i II, PWN, Warszawa 2003 4. Piszczala J., <i>Matematyka i jej zastosowanie w naukach ekonomicznych</i>, Wydawnictwo AE w Poznaniu, Poznań 1998 5. Piszczala J., Piszczala M., Wojcieszyn B., <i>Matematyka z zadaniami</i>, PWN, Warszawa 1981							
	eResources addresses								
Example issues/ example questions/ tasks being completed									
Work placement	Not applicable								

Document generated electronically. Does not require a seal or signature.