



Subject card

Subject name and code	MATHEMATICS 2, PG_00070878						
Field of study	Economic Analytics						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2026/2027		
Education level	first-cycle 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	2	ECTS credits			6.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Mathematics Center -> Vice-Rector For Education						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Renata Zakrzewska				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	18.0	27.0	0.0	0.0	0.0	45
	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	45		3.0		102.0	150
Subject objectives	Uses the apparatus of linear algebra and mathematical analysis to solve theoretical and practical problems occurring in social sciences						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U04] develops logical solutions to complex or unstructured problems, even under conditions of uncertainty.		integrates the information obtained from solving complex problems, interpreting them, drawing conclusions and formulating and justifying opinions		[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		
[K6_W02] possesses advanced knowledge of methods and techniques that enable precise formulation and effective problem solving.		uses a mathematical apparatus to solve economic problems, combining knowledge of mathematics with knowledge of social sciences		[SW1] Assessment of factual knowledge			
Subject contents	<p>Course content – lecture</p> <p>Linear geometry of 3-dimensional space. Vectors. Conics and quadrics.</p> <p>Complex numbers.</p> <p>Vector spaces and subspaces. Linear independence. Basis and dimension. Linear maps. Quadratic forms. Eigenvectors and eigenvalues. Sylvester's criterion. LSM.</p> <p>The process of finding antiderivatives and integration formulas the methods of substitution and integration by parts. Integration of basic families of functions.</p> <p>Fundamental Theorem of Calculus. Methods of evaluations of definite integrals. Integration formulas, the methods of substitution and integration by parts for definite integrals. Improper integrals. Selected applications of definite integrals.</p> <p>Functions of two variables: Partial derivatives. Total differential. Maxima and minima of a function of several variables.</p> <p>Number series.</p> <p>Differential and difference linear equations.</p> <p>Constrained extrema.</p>						
Prerequisites and co-requisites	Knowledge of the subject: Mathematics 1.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Exam		50.0%		35.0%		
	Activity		50.0%		5.0%		
	Tests		50.0%		60.0%		

Recommended reading	Basic literature	Jankowska, K., Jankowski, T. Zbiór zadań z matematyki. Gdańsk: Wydawnictwo PG, Jankowska, K., Jankowski, T., Funkcje wielu zmiennych - Całki wielokrotne - Geometria analityczna. Gdańsk: Wydawnictwo PG, Dymkowska, J., Beger, D. (2015). Rachunek całkowy w zadaniach, Gdańsk: Wydawnictwo PG Gurgul, H., Suder, M. Matematyka dla kierunków ekonomicznych, Warszawa: Oficyna a Wolters Kluwer business.
	Supplementary literature	Banaś, J., Podstawy matematyki dla ekonomistów. Warszawa: Wydawnictwa Naukowo-Techniczne Gewert, M., Skoczylas, Z. Analiza matematyczna 1, Przykłady i zadania. Wrocław: Wydawnictwo GiS. Gewert, M., Skoczylas, Z. Analiza matematyczna 2, Definicje, twierdzenia wzory. Wrocław: Wydawnictwo GiS. Gewert, M., Skoczylas, Z. Analiza matematyczna 2, Przykłady i zadania. Wrocław: Wydawnictwo GiS. Sozański, B., Dziedzic, I. Algebra i analiza w zagadnieniach ekonomicznych. Rzeszów: Wydawnictwo Bila. J.Dymkowska, D. Beger; Rachunek całkowy w zadaniach. Gdańsk Wydawnictwo PG J.Dymkowska, D. Beger; Rachunek różniczkowy w zadaniach. Gdańsk Wydawnictwo PG
	eResources addresses	
Example issues/ example questions/ tasks being completed	<p>Show the series convergence ... and find its sum. Check the linear dependence of a given system of vectors. Find the integral of the rational function ... Find the improper integral ... or demonstrate its divergence. Find the local extremes of the function $f(x, y) = \dots$ Solve the differential equation using the constant variation method. Find the general solution of the third order differential equation ... using the prediction</p>	
Practical activities within the subject	Not applicable	

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