



Subject card

Subject name and code	MATHEMATICS 2, PG_00066470						
Field of study	Economic Analytics						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2024/2025		
Education level	first-cycle 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	2	ECTS credits			5.0		
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	dr inż. Renata Zakrzewska					
Lesson types and methods of instruction	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		6.0		59.0	125
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_W02] Demonstrates advanced knowledge of methods and techniques related to the field of study in economic analytics to explain complex problems.	uses a mathematical apparatus to solve economic problems, combining knowledge of mathematics with knowledge of social sciences			[SW1] Assessment of factual knowledge		
	[K6_U04] Develops logical solutions to complex or unstructured problems in processes conducted 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		
Subject contents	Linear geometry of 3-dimensional space. Vectors. Conics and quadrics. Complex numbers. Vector spaces and subspaces. Linear independence. Basis and dimension. Linear maps. Quadratic forms. Eigenvectors and eigenvalues. Sylvester's criterion. LSM. The process of finding antiderivatives and integration formulas the methods of substitution and integration by parts. Integration of basic families of functions. 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. Functions of two variables: Partial derivatives. Total differential. Maxima and minima of a function of several variables. Number series. Differential and difference linear equations. Constrained extrema.						
Prerequisites and co-requisites	Knowledge of the subject: Mathematics 1.						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	Tests	50.0%			20.0%		
	Activity	50.0%			20.0%		
	Exam	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.
	eResources addresses	Adresy na platformie eNauczanie:
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>	
Work placement	Not applicable	

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