

Subject card

Subject name and code	Mathematical Applications in Economics and Management, PG_00169872						
Field of study	Economics						
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		4.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Department of Microeconomics -> Faculty of Economics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Małgorzata Zielenkiewicz				
	Teachers		dr Małgorzata Zielenkiewicz				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	30.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
	eNauczanie source addresses: Moodle ID: 13081 Zastosowania matematyki w ekonomii i zarządzaniu 2025/2026 SS1-EK https://mdl.ug.edu.pl/course/view.php?id=13081						
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		10.0		60.0	100
Subject objectives	Acquainting students with the introduction to higher mathematics and its applications in economics and management.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[EKONL3_U02] is able to use the knowledge of theory and data to analyse concrete economic and social processes and phenomena and to analyse these phenomena using methods developed in economics, finance and management sciences	The student is able to analyze the causes and course of economic processes based on basic economic models. She/he deepens her/his knowledge by solving tasks outside of class and consulting with the teacher.	[SU1] oral statement/conversation/discussion [SU4] test/exam - oral or written [SU5] implementation of a problem task
	[EKONL3_U04] can predict and forecast the course of economic and social processes and phenomena	The student has the ability to apply mathematics in economics and management and to use mathematical methods in modeling and interpreting economic phenomena. Using elements of differential calculus, she/he can optimize functions of one and many variables in issues related to the theory of enterprise choice and market organization.	[SU1] oral statement/conversation/discussion [SU4] test/exam - oral or written
	[EKONL3_W06] have an advanced knowledge of selected methods and tools, including statistical and econometric techniques, for describing economic agents and structures as well as social institutions and the processes taking place in them	The student has knowledge in the field of single and multivariable functions, elements of differential and integral calculus, unconditional and conditional optimization methods and their applications in business decision modeling, and has basic knowledge related to modeling the dynamics of economic processes	[SW4] test/exam - oral or written [SW1] oral statement/conversation/discussion [SW5] implementation of a problem task
Subject contents	[EKONL3_K05] correctly identifies, diagnoses and resolves professional dilemmas and different options for solutions	The student correctly identifies, diagnoses and solves dilemmas and possibilities regarding economic problems related to the use of mathematical methods	[SK1] oral statement/conversation/discussion [SK4] test/exam - oral or written [SK5] implementation of a problem task
	1. Matrix algebra2. Differential calculus3. Integral calculus		
Prerequisites and co-requisites	Knowledge and skills in mathematics from high school		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	To receive a positive grade for the exercises, the student must obtain at least 51% of the total points for the activity, group work performed (20%), individual work tasks (20%) and final tests (60%).	51.0%	100.0%
Recommended reading	Basic literature	1. E. Babula, L. Czerwonka (red.), Zastosowanie matematyki w ekonomii i zarządzaniu, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk 2015	
		2. A. Blajer-Gołębiewska, L. Czerwonka, E. Pankau, M. Zielenkiewicz, Ekonomia matematyczna w zadaniach, red. T. Kamińska, Wyd. UG, Gdańsk 2010	
		3. M. Wisniewski, Mathematics for economics, Palgrave Macmillan, 2021	

	Supplementary literature	1. K. Sydsaeter, P. Hammond, A. Seierstad, A. Strom, Further mathematics for economic analysis, FT Prentice Hall, Harlow 2005 2. B. Batóg, B. Bieszk-Stolorz, I. Foryś, M. Guzowska, K. Heberlein, Mathematics for students of economics, finance and management, Difin, Warszawa 2021 3. T. Bradley, Essential mathematics for economics and business, Wiley, 2013 4. A.C. Chiang, Podstawy ekonomii matematycznej, PWE, Warszawa 1994 5. L. Czerwonka, Matematyczne modele połączeń przedsiębiorstw uwzględniające czynniki menedżerskie, Pieniądze i Więż. Kwartalnik Naukowy, Nr 3/2009, s. 81-88 6. L. Czerwonka, Zastosowanie matematycznych modeli fuzji egzogenicznych, Pieniądze i Więż. Kwartalnik Naukowy, Nr 1/2008, s. 133-140 7. M. Małoka, Matematyka dla ekonomistów, Wyd. AE w Poznaniu, Poznań 2008 8. A. Ostoja-Ostaszewski, Matematyka w ekonomii. Modele i metody t. 1 i 2, Wydawnictwo Naukowe PWN, Warszawa 2006 9. J. Piszczala, Matematyka i jej zastosowanie w naukach ekonomicznych, Wydawnictwo AE w Poznaniu, Poznań 2008 10. R.A. Barnett, M.R. Ziegler, K.E. Byleen, College Mathematics for Business, Economics, Life Sciences, and Social Sciences, Pearson Prentice Hall, Upper Saddle River, New Jersey 2008 r, New Jersey 2008
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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