

Subject card

Subject name and code	Mathematics for Economics, PG_00178594						
Field of study	Finance and Accounting						
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		English English		
Semester of study	1		ECTS credits		6.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Department of Econometrics -> Faculty of Management -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Marta Chylińska				
	Teachers						
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	The aim of the course is to provide students with an understanding of the mathematical knowledge for finance and investment. The course gives students skills for implementation of the mathematical knowledge and expertise to the problems of finance and investment. Its prerequisites are both the knowledge of the single variable calculus and the foundations of linear algebra including operations on matrices and the general theory of systems of simultaneous equations.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[FiRL3_W02] The student has advanced knowledge and understanding of the functioning of the domestic and international financial market and financial instruments and institutions.		The student knows advanced mathematical tools appropriate to the science of management and quality.		[SW4] test/exam - oral or written		
	[FiRL3_U02] The student can identify, analyze or design adequate solutions to problems in finance and accounting.		The student is able to determine priorities for solving mathematical problems, independently solve mathematical tasks		[SU4] test/exam - oral or written		

Subject contents	1. Matrix algebra: Matrices and Vectors, Matrix Operations, Commutative, Associative and Distributive Laws, Identity and Null Matrices, Transposes and Inverses, Conditions for Nonsingularity of a Matrix, Basic Properties of Determinants. 2. Linear Models and Matrix Algebra: Finding the Inverse Matrix, Cramers Rule, Application to Market and National-Income Models, Limitations of Static Analysis 3. Functions, Graphs, and Models: Functions and Models, Finding Domain and Range, Slope and Linear Functions, Nonlinear Functions and Models, Mathematical Modeling and Curve Fitting. 4. Differentiation: Limits: A Numerical and Graphical Approach, Algebraic Limits and Continuity, Average Rates of Change, Differentiation Using Limits of Difference Quotients, Differentiation Techniques: The Power and Sum/Difference Rules, Differentiation Techniques: The Product and Quotient Rules, The Chain Rule, Higher-Order Derivative. 5. Applications of Differentiation: Using First Derivatives to Find Maximum and Minimum Values and Sketch Graphs, Using Second Derivatives to Find Maximum and Minimum Values and Sketch Graphs, Graph Sketching: Asymptotes and Rational Functions, Using Derivatives to Find Absolute Maximum and Minimum Values, Maximum/Minimum Problems, Business and Economics Applications, Marginals and Differentials, Implicit Differentiation and Related Rates. 6. Integration: Antidifferentiation, Antiderivatives as Areas, Area and Definite Integrals, Properties of Definite Integrals, Integration Techniques Substitution and by Parts. 7. Applications of Integration: Consumer Surplus and Producer Surplus, Integrating Growth and Decay Models, Improper Integrals, Probability and Expected Value, The Normal Distribution.		
Prerequisites and co-requisites	Basic algebra concepts, such as properties of exponents, multiplying and factoring polynomials, equation solving		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	2 written tests	51.0%	100.0%
Recommended reading	Basic literature	1. Bittinger M.L., Ellenbogen D.J., Surgent S.A., Calculus and its applications, Pearson Addison-Wesley, 2012 2. Gruber M.H.J., Matrix Algebra for Linear Models, Wiley, 2013	
	Supplementary literature	1. Chiang A.C., Fundamental methods of mathematical economics, McGraw-Hill, 1984.	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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