University of Gdańsk

Subject card

Subject name and code	Mathematical Applications in Economics and Management, PG_00135878		
Field of study	International Economic Relations		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	undergraduate 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	1	ECTS credits	4.0
Learning profile	academic	Assessment form	
Conducting unit	Katedra Mikroekonomii -> Faculty of Economics -> Rektor		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Marcin Brycz	
	Teachers	dr Marcin Brycz	

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	20.0	0.0	0.0	0.0	20
	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	20	0.0	0.0	20

Subject objectives	To familiarize students with the basics of higher mathematics and its applications in economics and management.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[MSGL3_W10] knows selected methods and tools, including IT tools and data acquisition techniques, which make it possible to describe and analyse economic entities operating on the international market; knows the processes and phenomena occurring in them and between them, and processes supporting decision-making	The student has knowledge of selected methods and tools, including IT tools, data acquisition techniques and mathematical methods that enable the description and analysis of economic entities operating on the international market. He also knows the processes and phenomena occurring in these entities and between them, as well as the mechanisms supporting the decision-making process.	[SW5] implementation of a problem task
[MSGL3_U04] uses the acquired theoretical knowledge in economics to analyse and evaluate the operation of economic entities on the international market, with particular emphasis on the European Union market	A student combines economic knowledge with mathematical skills to analyze and evaluate the performance of companies in the global market, with a particular focus on the European Union.	[SU4] test/exam - oral or written
[MSGL3_W01] has an advanced knowledge of economic sciences, in particular of economics and its place in the system of sciences, including within related disciplines	The student has advanced knowledge in the field of economic sciences, with particular emphasis on economics and its role in the system of sciences. He also understands the connections between economics and related scientific disciplines and its close relationship with mathematics.	[SW4] test/exam - oral or written
[MSGL3_K05] correctly identifies, diagnoses and solves dilemmas and various options of solutions related to the profession	The student effectively identifies, analyses and solves dilemmas and various variants of professional problems, using knowledge and skills in the field of mathematical methods.	[SK4] test/exam - oral or written
[MSGL3_U02] can assess economic and social phenomena occurring in an open economy, interpret necessary statistical data and economic indicators, as well as forecast economic phenomena and processes, using standard methods and tools applied in economic sciences	The student has the ability to analyze and evaluate economic and social phenomena occurring in an open economy. He can interpret appropriate statistical data and economic indicators, as well as forecast economic processes and phenomena, using standard methods and tools used in economic sciences, taking into account knowledge of mathematical methods.	[SU4] test/exam - oral or written

Subject contents

1. Subject: Matrix AlgebraOperations on matrices, basic properties of determinants, finding the inverse matrix, Cramer's rule, application to market and national income models (matrix notation and model solution)2. Subject: Elements of differential calculus -Rules of differentiation for functions of one variable, local extrema of functions of one variable, monotonicity of functions, graph of functions, inflection point of functions, elasticity of functions, marginal calculus, maximization of economic result, rules of differentiation of functions of many variables, optimization of functions of many variables, conditional extremum, minimization of costs using the method of Lagrange multipliers. Production optimization3. Integral calculusconcept of antiderivative function, definite and indefinite integral, method of integration by parts, method of integration by substitution, calculation of area under the graph of a function, applications in marginal calculus and financial mathematics

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Activity	0.0%	10.0%
Matrix in Excel	0.0%	10.0%
Test	51.0%	80.0%

Recommended reading

Basic literature	1. Babula E., Czerwonka L. (red.), Zastosowanie matematyki w ekonomii i zarządzaniu, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk 2015.
Supplementary literature	Chiang A.C., Podstawy ekonomii matematycznej, PWE, Warszawa 1994.

	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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