University of Gdańsk

Subject card

Subject name and code	Mathematical Economics, PG_00199298		
Field of study	Economics		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	Master's studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research 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	3.0
Learning profile	academic	Assessment form	exam
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	15.0	15.0	0.0	30.0	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	0.0	15.0	75

Subject objectives	The aim of the course is to familiarize the student with the basics of modeling economic processes and phenomena using mathematical methods.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[EKONMU2_U02] can use acquired knowledge to describe and analyse the causes and course of economic and social processes and phenomena, and can formulate his/her own opinions and critically select data and analysis methods based on the achievements of economic and social sciences	The student is able to use the knowledge of mathematical economics to mathematically describe and analyze the course of economic processes and phenomena and is able to critically select data and analytical methods, as demonstrated by completing problem-solving tasks/ projects outside of class, which are then discussed with the instructor.	[SU2] presentation/project/paper/ report [SU4] test/exam - oral or written [SU5] implementation of a problem task
[EKONMU2_U04] can forecast and model complex economic and social processes using quantitative and qualitative methods and tools developed by economic sciences (including statistics and econometrics)	The student is able to model complex economic processes using quantitative methods and tools created by mathematical economics.	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written
[EKONMU2_K02] is aware of the level of their knowledge in the area of solving complex problems in economic,; understands the need to extend and update this knowledge throughout his/her life	The student is aware of the level of her/his knowledge in the area of mathematical economics and understands the need to deepen and update this knowledge throughout his/her life.	[SK1] oral statement/conversation/ discussion [SK4] test/exam - oral or written
[EKONMU2_U01] can creatively interpret and explain economic and social phenomena and relations between them, using acquired knowledge of economics, finance and management sciences	The student is able to interpret and explain economic phenomena and the relationships between these phenomena, using her/his knowledge of mathematical economics.	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written
[EKONMU2_U08] can independently analyse economic and social phenomena and processes, and can perform a theoretically deepened assessment of such phenomena, using appropriately selected research method	The student is able to independently analyze economic phenomena and processes, has the ability to theoretically in-depth assessment of these phenomena, using an appropriately selected research method in the field of mathematical economics	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written
[EKONMU2_K01] recognises the importance of knowledge in the field of economics in the process of identifying and solving economic problems and of consulting experts when having difficulties in solving them independently	The student recognizes the importance of knowledge in the field of mathematical economics in the process of identifying and solving economic problems.	[SK1] oral statement/conversation/ discussion [SK4] test/exam - oral or written
[EKONMU2_W01] has an in-depth knowledge of the nature of social sciences and their place in the system of sciences; understands the differences between contemporary trends in economic thought; knows the claims of contemporary economic theories	The student has in-depth knowledge of the nature of economics, its connections with mathematics and the possibilities of using mathematics to model economic phenomena.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion

Subject contents	1. Demand theory 2. Decisions in conditions of risk and uncertainty 3. Game theory 4. Partial and general balance 5. Growth models The program is carried out both during classes and outside of them through the students independent completion of problem-solving tasks/projects, which are consulted with the instructor. To pass the course, students must score at least 51% of the total points from the practical classes and 51% of the points from the final exam. The final grade is based on the combined total points scored in both the practical and lecture components.
Prerequisites and co-requisites	Ability to apply knowledge acquired during higher education in the field of mathematics, macroeconomics and microeconomics.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Assessment for the practical classes is based on a written test consisting of problem-solving tasks, as well as student activities completed both in and outside of class (quizzes, assignments).	51.0%	50.0%
An exam covering the lecture section is administered in a written format.	51.0%	50.0%

Recommended reading

Basic literature	1. A. Blajer-Gołębiewska, L. Czerwonka, E. Pankau, M. Zielenkiewicz: Ekonomia matematyczna w zadaniach, pod red. T. Kamińskiej, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk 2006.
Supplementary literature	1. A.C. Chiang: Podstawy ekonomii matematycznej, PWE 1994. 2. A. Ostoja - Ostaszewski: Matematyka w ekonomii. Modele i metody t. 1 i 2, Wydawnictwo Naukowe PWN, Warszawa 1996. 3. E. Panek: Ekonomia matematyczna, AE Poznań 2000. 4. E. Panek: Podstawy ekonomii matematycznej. Materiały do ćwiczeń, Wydawnictwo Akademii Ekonomicznej w Poznaniu, Poznań 2002. 5. W. Łyszkiewicz: Industrial organization. Organizacja rynku i konkurencja, Warszawa 2000. 6. D. Romer: Makroekonomia dla zaawansowanych, Wydawnictwo Naukowe PWN, Warszawa 2000. 7. M. Osborne, An Introduction to Game Theory, Oxford University Press, Oxford 2004.
eResources addresses	

Example issues/ example questions/ tasks being completed	To pass the course, students must score at least 51% of the total points from the practical classes and 51% of the points from the final exam. The final grade is based on the combined total points scored in both the practical and lecture components.
Work placement	Not applicable

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