

Identification	Subject (code, title, credits)	MATH 225 Mathematics for Economics and Business – 6 ECTS	
	Department	Mathematics	
	Program	Undergraduate	
	Term	Fall, 2026	
	Instructor	Vusal Osmanov	
	E-mail:	Saracli@mail.ru	
	Classroom/hours	Monday: 08:30-10:00, Friday: 08:30-10:00	
	Office hours		
Prerequisites	-		
Language	English		
Compulsory/Elective	Compulsory		
Required textbooks and course materials	[1] Hass, J., Heil, C., & Weir, M. D. (2023). <i>Thomas' Calculus</i> (15th ed.). Pearson. [2] Lay, D. C., Lay, S. R., & McDonald, J. (2016). <i>Linear Algebra and Its Applications</i> (5th ed.). Pearson. Additional materials: 1. Stewart, J., Clegg, D. K., Watson, S. (2021). <i>Calculus: Early Transcendentals</i>, 9th Edition. 2. Larson, R., & Edwards, B. H. (2018). <i>Calculus</i> (11th ed.). Cengage Learning		
Course outline	A wide variety of problems from economics and business can be solved by using mathematical models. Equations and their graphs are used in studying costs, revenues, profit, and supply and demand. Numerous applications of mathematics are given throughout the course.		
Course objectives	To allow the students to use mathematical methods in solving different problems of economics and business.		
Learning outcomes	Students successfully completing this course should be able to · Understand mathematical language of modern economics and business; · Use mathematical methods and tools; · Apply some mathematical methods and tools to economic theories; · Interpret the results of mathematical models.		
Teaching methods	Lecture		X
	Group discussion		X
	Problem Solving		X
	Homework assignments		X
	Simulation		
	Course paper		
	Others		

Evaluation	Methods	Date/deadlines	Percentage (%)
	Midterm Exam		30
	Case studies		
	Class attendance		5
	Class activity		5
	Quizzes		20 (4 quizzes)
	Final Exam		40
	Others		
	Total		100
Policy	▪ Use of Generative AI Tools The use of generative artificial intelligence (GAI) tools is strictly prohibited in this course. The primary aim of the course is to develop students' independent mathematical reasoning, problem-solving skills, and creative thinking. Students are therefore expected to complete all assignments and assessments independently without the use of GAI tools. If it is determined that a student has used generative artificial intelligence (GenAI) tools while completing assignments, one of the following measures may be applied: • Issuing an oral or written warning; • Requiring the resubmission of the assignment; • Reducing the grade for the assignment or assigning a zero (0). Attendance and activity The students are required to attend all classes as part of their studies and those having legitimate reasons for absence (illness, family bereavement etc.) are required to inform the instructor. However, this student is able to enter the second double hours without delaying. The attendance and participation will account for 5% of the total course grade, which depends on students' good class attendance and active participation in class discussions. Withdrawal (pass/fail) This course strictly follows grading policy of the School of Economics and Management. Thus, a student is normally expected to achieve a mark of at least 60% to pass. In case of failure, he/she will be referred or required to repeat the course the following term or year. For referral, the student will be required to take examination scheduled by instructor. Assignments/quizzes The overall course will consist of 4 quizzes, one of them before midterm exam and the two after midterm exam. Total score for all quizzes is 20% with 5% for each. Cheating/plagiarism Cheating or other plagiarism during the Quizzes, Mid-term and Final Examination will lead to paper cancellation. In this case, the student will automatically get zero (0), without any considerations. Professional behavior guidelines The students shall behave in the way to create favorable academic and		

		professional environment during the class hours. Unauthorized discussions and unethical behavior are strictly prohibited.	
Tentative Schedule			
Week	Date/Day (tentative)	Topics	Textbook/Assignments
1	18.09.2026 21.09.2026	Functions and their graphs. Combining functions: Shifting and Scaling Graphs. Trigonometric functions. Graphing with Software. Exponential functions. Inverse functions and logarithms.	1.1-1.6 [1] Pg.[1-53]

2	25.09.2026 28.09.2026	Limit of function and limit laws. The Precise definition of a Limit. One-Sided limits. Limits involving infinity; Asymptotes of graphs.	2.2-2.4, 2.6 [1] Pg.[66-92, 104-117]
3	02.10.2026 05.10.2026	Tangents and the derivative at a point. The derivative as a function. Differentiation rules. The derivative as a rate of change. Derivatives of trigonometric functions. The chain rule. QUIZ 1 (5pts.)	3.1-3.6[1] Pg.[123-170]
4	09.10.2026 12.10.2026	Implicit differentiation. Derivatives of Inverse functions and logarithms.	3.7-3.9 [1] P.[171-186]
5	16.10.2026 19.10.2026	Inverse trigonometric functions. Related Rates. Linearisation and differentials.	3.10-3.11[1] P.[187-201]
6	23.10.2026 26.10.2026	Applications of derivatives. Extreme values of functions. The mean value theorem.	4.1-4.2 [1] Pg.[223-238]
7	30.10.2026 02.11.2026	Monotonic functions and the first derivative test. Concavity and curve sketching.	4.3-4.4 [1] Pg.[239-254]
8	06.11.2026 09.11.2026	Indeterminate forms and L'Hopital's rule. Applied optimization. Holiday	4.5-4.6[1] Pg.[255-275]
9	13.11.2026 16.11.2026	Newton's method. Antiderivatives. QUIZ 2 (5pts.)	4.7-4.8 [1] P.276-290
10	20.11.2026 23.11.2026	Systems of linear equations. Row reduction and echelon forms. MIDTERM EXAM	1.1-1.3 [2] Pg.[2-34]
11	27.11.2026 30.11.2026	The matrix equation $Ax=b$. Solution sets of Linear systems. Applications of linear systems. Linear independence.	1.4-1.7[2] Pg.[35-62]
12	04.12.2026 07.12.2026	Introduction to linear transformations. The matrix of a linear transformation. Linear models in business, science, and engineering. QUIZ 3 (5pts.)	1.8-1.10[2] Pg.[63-88]

13	11.12.2026 14.12.2026	Computer models in aircraft design. Matrix operations. The inverse of a matrix.	2.1-2.2[2] Pg.[93-112]
14	18.12.2026 21.12.2026	Characterizations of invertible matrices. Partitioned matrices. Matrix Factorizations. The Leontief input-output model.	2.3-2.6 [2] Pg.[113-139]
15	25.12.2026 28.12.2026	Introduction to determinants. Properties of determinants. Cramer's rule, volume, and linear transformations QUIZ 4 (5pts.)	3.1-3.3 [2] Pg.[166-187]
	TBA	FINAL EXAM	

This syllabus is a guide for the course and any modifications to it will be announced in advance.