

<b>Identification</b>	<b>Subject (code, title, credits)</b>	<b>MATH 225 Mathematics for Economics and Business – 6 ECTS</b>
	<b>Department</b>	Mathematics
	<b>Program</b>	Undergraduate
	<b>Term</b>	Fall, 2024
	<b>Instructor</b>	Afruz Niftaliyeva
	<b>E-mail:</b>	
	<b>Classroom/hours</b>	Saturday 11:50-13:20, 13:40-15:10
	<b>Office hours</b>	
<b>Prerequisites</b>	-	
<b>Language</b>	English	
<b>Compulsory/Elective</b>	Compulsory	
<b>Required textbooks and course materials</b>	<p>[1] George B. Thomas', Calculus 13th edition. 2014, 536 p.</p> <p>[2] Linear Algebra and Its applications David C. Lay University of Maryland Norton, 1994.</p> <p>Additional materials:</p> <ol style="list-style-type: none"> <li>1. James Stewart. Calculus (8<sup>th</sup> edition.). Brooks Cole, 2015, 1368 p.</li> <li>2. Ron Larson and Bruce Edwards. Calculus (10<sup>th</sup> edition). Cengage Learning, 2013, 1280 p.</li> </ol>	
<b>Course outline</b>	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.	
<b>Course objectives</b>	To allow the students to use mathematical methods in solving different problems of economics and business.	
<b>Learning outcomes</b>	<p>Students successfully completing this course should be able to</p> <ul style="list-style-type: none"> <li>· Understand mathematical language of modern economics and business;</li> <li>· Use mathematical methods and tools;</li> <li>· Apply some mathematical methods and tools to economic theories;</li> <li>· Interpret the results of the mathematical models.</li> </ul>	
<b>Teaching methods</b>	<b>Lecture</b>	X
	<b>Group discussion</b>	X
	<b>Problem Solving</b>	X
	<b>Homework assignments</b>	X
	<b>Simulation</b>	
	<b>Course paper</b>	

		<b>Others</b>		
<b>Evaluation</b>	<b>Methods</b>		<b>Date/deadlines</b>	<b>Percentage (%)</b>
	<b>Midterm Exam</b>			30
	<b>Case studies</b>			
	<b>Class attendance</b>			5
	<b>Class activity</b>			5
	<b>Quizzes (2 quizzes with equal weight)</b>		12.10.2024 30.11.2024	20
	<b>Final Exam</b>			40
	<b>Others</b>			
	<b>Total</b>			100
<b>Policy</b>		<p><b>Attendance and activity</b> 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.</p> <p><b>Withdrawal (pass/fail)</b> 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.</p> <p><b>Assignments/quizzes</b> The overall course will consist of 2 quizzes, which one of them before midterm exam and the two after midterm exam. Total score for all quizzes is 20% with 10% for each.</p> <p><b>Cheating/plagiarism</b> 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.</p> <p><b>Professional behavior guidelines</b> 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.</p>		
<b>Tentative Schedule</b>				
<b>Week</b>	<b>Date/Day (tentative)</b>	<b>Topics</b>		<b>Textbook/Assignments</b>
1	21.09.2024 21.09.2024	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]

2	28.09.2024 28.09.2024	Limit of function and limit laws. One-Sided limits. Limits involving infinity; Asymptotes of graphs.	2.2-2.4, 2.6 [1]
3	05.10.2024 05.10.2024	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.	3.1-3.6[1]
4	12.10.2024 12.10.2024	Implicit differentiation. Derivatives of Inverse functions and logarithms. Inverse trigonometric functions. Related Rates. Linearization and differentials. <b>QUIZ 1.</b>	3.7-3.11 [1]
5	19.10.2024 19.10.2024	Applications of derivatives. Extreme values of functions. The mean value theorem. Monotonic functions and the first derivative test. Concavity and curve sketching.	4.1-4.4 [1]
6	26.10.2024 26.10.2024	Indeterminate forms and L'Hopital's rule. Applied optimization. Newton's method. Antiderivatives.	4.5-4.8 [1]
7	02.11.2024 02.11.2024	Linear models in Economics. Systems of linear equations. Row reduction and echelon forms. Vector equations.	1.1-1.3 [2]
8	09.11.2024 09.11.2024	<b>Holiday</b>	
9	16.11.2024 16.11.2024	<b>Midterm exam</b>	
10	23.11.2024 23.11.2024	The matrix equation $Ax=b$ . Solution sets of Linear systems. Applications of linear systems. Linear independence.	1.4-1.7[2]
11	30.11.2024 30.11.2024	Introduction to linear transformations. The matrix of a linear transformation. Linear models in business, science, and engineering. <b>QUIZ 2.</b>	1.8-1.10[2]
12	07.12.2024 07.12.2024	Computer models in aircraft design. Matrix operations. The inverse of a matrix.	2.1-2.2[2]
13	14.12.2024 14.12.2024	Characterizations of invertible matrices. Partitioned matrices. Matrix Factorizations. The Leontief input-output model.	2.3-2.6 [2]
14	21.12.2024 21.12.2024	Applications to computer graphics. Subspaces of $R^n$ . Dimension and rank.	2.7-2.9 [2]
15	28.12.2024 28.12.2024	Introduction to determinants. Properties of determinants. Cramer's rule, volume, and linear transformations	3.1-3.3 [2]
	<b>TBA</b>	<b>Final exam</b>	

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