

<b>Identification</b>	<b>Subject</b>	ECON 805 Advanced mathematics of economics, 6 ECTS
	<b>Department</b>	Mathematics
	<b>Program</b>	Graduate (MBA)
	<b>Term</b>	Fall, 2024
	<b>Instructor</b>	Ramiz Qarayev
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	<b>Phone:</b>	(+994) 55-574-08-70
	<b>Classroom/hours</b>	Wednesday: 18:30-21:00
<b>Prerequisites</b>	-	
<b>Language</b>	English	
<b>Compulsory/Elective</b>	Required	
<b>Required textbooks and course materials</b>	<p><i>Core Textbooks:</i></p> <ol style="list-style-type: none"> <li>George Thomas, et al, Thomas' Calculus: Early Transcendental, 12th edition, Addison-Wesley (2010), (<a href="http://libgen.org/">http://libgen.org/</a>)</li> <li>Ron Larson, David C. Falvo, "Elementary Linear Algebra", 6th Edition</li> </ol> <p><b>Supplementary book:</b></p> <ol style="list-style-type: none"> <li>James Stewart, Essential calculus. Early transcendentals, Second Edition, Brooks/Cole (2013) (<a href="http://libgen.org/">http://libgen.org/</a>)</li> <li>Paul Dawkins, Linear Algebra. 2007</li> <li>Seymour Lipschutz, Marc Lipson Schaum's Outline of "Linear Algebra", 4th Edition (2008)</li> </ol>	
<b>Course outline</b>	<p>This course can roughly be divided into two parts. In the first part we will study the definite and indefinite integrals and their various applications. The second part will be devoted to the study of the system of linear equations, matrices and their determinants. Separable Differential Equations will also be studied. The final part of the course will deal with Cramer's rule and its general form. Applications will be provided by means of different examples. Topics include:</p> <ul style="list-style-type: none"> <li>• System of linear equations. Gaussian elimination method</li> <li>• Matrices</li> <li>• Determinant</li> <li>• Concept of Integrals, Definite integral</li> <li>• Indefinite integral</li> <li>• Applications of Definite integrals</li> </ul>	
<b>Course objectives</b>	The concepts of integral; area under the curve; substitution method in integral; applications of definite integrals to finding volumes, lengths of plane curves, and areas of surfaces of revolution; solution to the system of equations and matrices and evaluating determinants	
<b>Learning outcomes</b>	By the end of the course the students should be able: <ul style="list-style-type: none"> <li>• To solve system of linear equations</li> <li>• To calculate determinants</li> <li>• To find integral of the function</li> <li>• To apply theorems to solve real world problems by means of integral</li> </ul>	
<b>Teaching methods</b>	<b>Lecture</b>	x

	<b>Group discussion</b>	x	
	<b>Experiential exercise</b>	x	
	<b>Course paper</b>	x	
<b>Evaluation</b>	<b>Methods</b>	<b>Date/deadlines</b>	<b>Percentage (%)</b>
	<b>Midterm Exam</b>		30
	<b>Class Participation</b>		5
	<b>Quizzes</b>		20 (3 quizzes)
	<b>Activity</b>		5
	<b>Final Exam</b>		40
	<b>Total</b>		100
<b>Policy</b>	<ul style="list-style-type: none"> <li>▪ <b>Preparation for class</b> The structure of this course makes your individual study and preparation outside the class extremely important. The lecture material will focus on the major points introduced in the text. Reading the assigned chapters and having some familiarity with them before class will greatly assist your understanding of the lecture. After the lecture, you should study your notes and work relevant problems and cases from the end of the chapter and sample exam questions. Throughout the semester we will also have a large number of review sessions. These review sessions will take place during the regularly scheduled class periods.</li> <li>▪ <b>Quizzes and examinations</b> Quizzes may be given unannounced throughout the term. There will be no make-up quizzes.</li> <li>▪ <b>Withdrawal (pass/fail)</b> This course strictly follows grading policy of the Graduate School of Economics and Business. Thus, a student is normally expected to achieve a mark of at least 60% to pass. In case of failure, he/she will be required to repeat the course the following term or year.</li> <li>▪ <b>Cheating/plagiarism</b> Cheating or other plagiarism during the Quizzes, Mid-term and Final Examinations will lead to paper cancellation. In this case, the student will automatically get zero (0), without any considerations.</li> <li>▪ <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.</li> <li>▪ <b>Ethic</b> Use of any electronic devices is prohibited in the classroom. All devices should be turned off before entering class. This is a university policy and <u>violators will be reprimanded accordingly!</u> Students should not arrive in late to class!</li> </ul>		

Week	Date/Day (Tentative)	Topics	Textbook/Assignments
1	18.09.24	<ul style="list-style-type: none"> <li>Matrices: Basic definitions, Matrix operations, Types of matrices, Kronecker Delta Symbol, Properties of Matrix Operations</li> </ul>	[1] Ch.2.1, 2.2
2	25.09.24	<ul style="list-style-type: none"> <li>Determinants: Permutations and Transpositions, Determinant General Definition, Properties of Determinants. Practice</li> </ul>	[2] Ch. 3.1, 3.2, 3.3
3	02.10.24	<ul style="list-style-type: none"> <li>Inverse matrices: Three Lemmas, Theorem of Inverse Matrix, Calculation of Inverse Matrices by Elementary Transformations</li> </ul>	[2] Ch. 2.3
4	09.10.24	<ul style="list-style-type: none"> <li>Systems of linear equations: Basic Concepts, Gaussian Elimination, Homogeneous Systems of Linear Equations</li> </ul>	[2] Ch. 1.1, 1.2
5	16.10.24	<ul style="list-style-type: none"> <li>Matrix Rank</li> </ul>	Quiz-1 (7 pts) [2] Ch. 4.6
6	23.10.24	<ul style="list-style-type: none"> <li>Cramer's Rule, Cramer's General Rule</li> </ul>	[2] Ch. 4.6
7	30.10.24	<ul style="list-style-type: none"> <li>Area and Estimating with Finite Sums</li> <li>Sigma Notation and Limits of Finite Sums</li> </ul>	[2] Ch. 5.1, 5.2
8	06.11.24	<ul style="list-style-type: none"> <li>The Definite Integral</li> <li>The Fundamental Theorem of Calculus</li> </ul>	[1] Ch. 5.3, 5.4
9	13.11.24	<ul style="list-style-type: none"> <li><b>Midterm Exam</b></li> <li>Indefinite Integrals and the Substitution Method</li> <li>Substitution and Area Between Curves</li> </ul>	[1] Ch. 5.5, 5.6
10	20.11.24	<ul style="list-style-type: none"> <li>Exponential Change and Separable Differential Equations</li> </ul>	[1] Ch. 7.2 Quiz-2 (7 pts)
11	27.11.24	<ul style="list-style-type: none"> <li>Volumes Using Cross-Sections</li> <li>Volumes Using Cylindrical Shells</li> </ul>	[1] Ch. 6.1, 6.2
12	04.12.24	<ul style="list-style-type: none"> <li>Arc Length</li> <li>Areas of Surfaces of Revolution</li> </ul>	[1] Ch. 6.3, 6.4 Quiz 3 (6 pts)
13	11.12.24	<ul style="list-style-type: none"> <li>Work and Fluid Forces</li> </ul>	[1] Ch. 6.5

14	18.12.24	<ul style="list-style-type: none"> <li>• Moments and Centers of Mass</li> <li>• Inverse Functions and Their Derivatives</li> </ul>	[1] Ch. 6.6, 7.1
15	25.12.24	<ul style="list-style-type: none"> <li>• Natural Logarithms</li> <li>Exponential Functions</li> </ul>	[1] Ch. 7.3, 7.4
	<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