Identification	**Subject**	Math 101, Calculus I, 6 ECTS
	Department	Mathematics
	Program	Undergraduate
	Term	Fall, 2025
	Instructor	Ali Huseynli
	E-mail:	ahuseynli@khazar.org
	Phone:	
	Classroom/hours	Friday: 11:50-13:20, 13:40-15:10
Prerequisites	The prerequisites are high school algebra and trigonometry. Prior experience with calculus is helpful but not necessary.	
Language	English	
Compulsory/Elective	Required	
Required textbooks and course materials	***Core Textbooks:*** 1. George Thomas, et al, Thomas' Calculus: Early Transcendental, 12th edition, Addison-Wesley (2010), (http://libgen.org/) ***Supplementary book*** 1. James Stewart,Essential calculus. Early transcendentals, Second Edition, Brooks/Cole (2013) (http://libgen.org/)	
Course outline	Calculus is a transition course to upper-division mathematics and computer science courses. Students will extend their experience with functions as they study the fundamental concepts of calculus: limiting behaviors, difference quotients and the derivative, Riemann sums and the definite integral, antiderivatives and indefinite integrals, and the Fundamental Theorem of Calculus. Students review and extend their knowledge of trigonometry and basic analytic geometry. Important objectives of the calculus sequence are to develop and strengthen the students' problem-solving skills and to teach them to read, write, speak, and think in the language of mathematics. In particular, students learn how to apply the tools of calculus to a variety of problem situations. Calculus plays an important role in the understandaing of science, engineering, economics and computer science, among other disciplines. As it's mentioned this introductory calculus course covers differentiation and initial techniques of integration of functions of one variable, with applications. Topics include: • Concept of functions; trigonometric funcrions • Limits and continuity • Derivative; Differentiation rules • Applications of derivative to investigation of extremes and graphing • Antiderivative	
Course objectives	Calculus 1 course objectives include understanding and applying the concepts of limits, derivatives, and integrals to analyze and model functions and real-world phenomena. Students will learn to evaluate limits, compute derivatives using differentiation rules, apply these skills to solve problems such as finding function extrema and rates of change, and perform basic integration—often	

<table>
<tr><td></td><td colspan="3">using the Fundamental Theorem of Calculus—to solve problems and explore applications in science and engineering.</td></tr>
<tr><td>Learning outcomes</td><td colspan="3">By the end of the course the students should be able:
• To find one-sided limits of functions;
• To find limit of functions at points and infinity;
• To find derivative of functions;
• To draw a graphs of nontrivial functions using limits and derivatives;
• To show the connection between area and the definite integral;
• To apply fundamental theorem of calculus to evaluate definite integral;
• To apply differentiation and integration to solve real world problems.</td></tr>
<tr><td rowspan="8">Teaching methods</td><td colspan="2">Lecture</td><td>x</td></tr>
<tr><td colspan="2">Group discussion</td><td>x</td></tr>
<tr><td colspan="2">Experiential exercise</td><td>x</td></tr>
<tr><td colspan="2">Simulation</td><td></td></tr>
<tr><td colspan="2">Case analysis</td><td></td></tr>
<tr><td colspan="2">Course paper</td><td>x</td></tr>
<tr><td colspan="2">Others</td><td></td></tr>
<tr><td rowspan="10">Evaluation</td><td>Methods</td><td>Date/deadlines</td><td>Percentage (%)</td></tr>
<tr><td>Midterm Exam</td><td></td><td>30</td></tr>
<tr><td>Case studies</td><td></td><td></td></tr>
<tr><td>Class Participation</td><td></td><td>5</td></tr>
<tr><td>Quizzes</td><td></td><td>20 (4 quizzes)</td></tr>
<tr><td>Activity</td><td></td><td>5</td></tr>
<tr><td>Laboratory work</td><td></td><td></td></tr>
<tr><td>Final Exam</td><td></td><td>40</td></tr>
<tr><td>Others</td><td></td><td></td></tr>
<tr><td>Total</td><td></td><td>100</td></tr>
<tr><td>Policy</td><td colspan="3">▪ Preparation for class
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.
▪ Quizzes and examinations
Quizzes may be given unannounced throughout the term. There will be no make-up quizzes.
▪ Withdrawal (pass/fail)</td></tr>
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This course strictly follows grading policy of the School of Science and Engineering. 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.

- **Cheating/plagiarism**

  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.

- **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.

- **Ethic**

  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 violators will be reprimanded accordingly!

Students should not arrive in late to class!

Tentative Schedule

Week	Date/Day (tentative)	Topics	Textbook/ Assignments
1	19.09.25 19.09.25	• Rates of Change and Tangents to Curves • Limit of a Function and Limit Laws	**Ch.2.1, 2.2**
2	26.09.25 26.09.25	• The Precise Definition of a Limit • Practice	**Ch. 2.3**
3	03.10.25 03.10.25	• One-Sided Limits • Continuity	**Ch. 2.4, 2.5**
4	10.10.25 10.10.25	• Limits Involving Infinity; Asymptotes of Graphs • Tangents and the Derivative at a Point	**Ch. 2.6, 3.1, Quiz (5 pts)**
5	17.10.25 17.10.25	• The Derivative as a Function • Differentiation Rules	**Ch. 3.2, 3.3**
6	24.10.25 24.10.25	• The Derivative as a Rate of Change • Derivatives of Trigonometric Functions.	**Ch.3.4,3.5**
7	31.10.25 31.10.25	• The Chain Rule • Implicit Differentiation	**Ch. 3.6, 3.7**
8	07.11.25 07.11.25	• Derivatives of Inverse Functions and Logarithms • **MIDTERM EXAM**	**Ch. 3.8** **Quiz (5 pts)**

9	14.11.25 14.11.25	• **Holiday** • Inverse Trigonometric Functions, Related Rates	**Ch. 3.9, 3.10**
10	21.11.25 21.11.25	• Linearization and Differentials • Extreme Values of Functions	**Ch. 3.11, 4.1**
11	28.11.25 28.11.25	• The Mean Value Theorem • Monotonic Functions and the First Derivative Test	**Ch.4.2, 4.3** **Quiz (5 pts)**
12	05.12.25 05.12.25	• Concavity and Curve Sketching, Indeterminate Forms and L'Hôpital's Rule • Antiderivatives.	**Ch. 4.4, 4.5, 4.8**
13	12.12.25 12.12.25	• Area and Estimating with Finite Sums • Sigma Notation and Limits of Finite Sums	**Ch. 5.1,5.2**
14	19.12.25 19.12.25	• The Definite Integral • The Fundamental Theorem of Calculus	**Ch. 5.3, 5.4** **Quiz (5 pts)**
15	26.12.25 26.12.25	• Indefinite Integrals and the Substitution Method • Substitution and Area Between Curves	**Ch. 5.5, 5.6**
	TBA	**Final Exam**	

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