MATH 113 Calculus I Fall 2023

Instructors: Gökhan Benli Section 1 (Office hours: Monday 11:40-13:30)
Semra Pamuk Section 2 (Office hours: Thursday 10:40-12:30)
Fırat Arıkan Section 3 (Office Hours: Monday-Thursday 11:00-12:00)

Assistants: İrem Özge Saraç Section 1
Melike Çakmak Section 2
Nazmi Oyar Section 3

Catalogue Description:
Functions. Limits and Continuity. Tangent lines and derivatives. Chain rule. Implicit differentiation. Inverse functions. Related rates. Linear approximations. Extreme values. Mean Value Theorem and its applications. Sketching graphs. Indeterminate forms and L'Hospital's rules. Definite integral. Antiderivatives and the Indefinite Integral. Fundamental Theorem of Calculus.

Course Objectives:
At the end of the course students are expected to:
Compute limits and carry out some basic proofs. Compute derivatives and use them in applications such as computing rates of change, finding extreme values, sketching graphs of functions by finding intervals of increase/decrease, concavity and asymptotes, use transcendental functions including logarithms, exponentials and inverse trigonometric functions effectively. Compute integrals by the Riemann Sum definition and use it to make approximations. Make use of basic techniques to compute proper integrals

Textbooks:
Robert A. Adams, Christopher Essex, CALCULUS: A Complete Course Calculus. Tenth Edition. (You can also use eighth or ninth editions)
Calculus, James Stewart, Fifth Edition

Exams:
There will be two in class midterm exams and one comprehensive final. Also, there will be quizzes and homework during the semester. Grading will be based on the following points:
MT1: 30 points, MT2: 30 points, Final: 40 Points, Homework/Quizzes: 10 Points, Total: 110 Points

Make up for Exams and Assignments
You can have at most one make-up exam. In order to be able to take the make-up exam, you must present a reasonable excuse (such as a medical report or an academic leave) when requested.

Information for Students with Disabilities
Students who experience difficulties due to their disabilities and wish to obtain academic adjustments and/or auxiliary aids must contact ODTU Disability Support Office and/or course instructor and the advisor of students with disabilities at academic departments (for the list: http://engelsiz.metu.edu.tr/en/advisor-students-disabilities) as soon as possible. For detailed information, please visit the website of Disability Support Office: https://engelsiz.metu.edu.tr/en/

Academic Honesty
The METU Honor Code is as follows: "Every member of METU community adopts the following honor code as one of the core principles of academic life and strives to develop an academic environment where continuous adherence to this code is promoted. The members of the METU community are reliable, responsible and honorable people who embrace only the success and recognition they deserve, and act with integrity in their use, evaluation and presentation of facts, data and document

Tentative weekly schedule:

Week		Topics	Section
1	**Oct. 2**	Real Numbers and the Real Line Cartesian Coordinates in the Plane Graphs of Quadratic Equations Functions and Their Graphs Combining Functions to Make New functions Polynomials and Rational Functions	P.1-P.6
2	**Oct. 9**	The Trigonometric Functions Limits of Functions	P.7 1.1,1.2
3	**Oct. 16**	Infinite Limits and Limits at Infinity Formal Definition of Limit	1.3 1.5
4	**Oct. 23**	Continuity Intermediate Value Theorem	1.4
5	**Oct. 30**	Tangent Lines and Their Slope The Derivative Differentiation Rules	2.1 2.2 2.3
		MIDTERM 1, Wednesday, November 8, 2023 17:40	
6	**Nov 6**	The Chain Rule Derivatives of Trigonometric Functions Higher-Order Derivatives	2.4 2.5 2.6
7	**Nov. 13**	The Mean-Value Theorem Implicit Differentiation	2.8 2.9
8	**Nov. 20**	Inverse Functions Exponential and Logarithmic Functions The Natural Logarithm and Exponential The Inverse Trigonometric Functions	3.1 3.2 3.3 3.5
9	**Nov. 27**	Hyperbolic Functions Related Rates Indeterminate Forms	3.6 4.1 4.3
10	**Dec. 4**	Extreme Values Concavity and Inflections Sketching the Graph of a Function	4.4 4.5 4.6
11	**Dec. 11**	Extreme-Value Problems Linear Approximations	4.8 4.9
		MIDTERM 2, Wednesday, December 20, 2023 17:40	
12	**Dec.18**	Sums and Sigma Notation Areas as Limits of Sums The Definite Integral	5.1 5.2 5.3
13	**Dec. 25**	The Definite Integral (continued) Properties of the Definite Integral Antiderivatives and the Indefinite Integral	5.3 5.4 2.10
14	**Jan. 1**	The Fundamental Theorem of Calculus	5.5