MATH 117 (Calculus I)
Spring 2024 (2023-2)

Frequency: Fall/Spring Terms

METU Credit & ECTS Credit: (4-2)5 & 7.5

Catalog Description: Functions and their graphs. Limits and continuity. Tangent lines and derivative. Chain rule. Implicit differentiation. Inverse functions. Related rates. Linear approximation. Extreme values. Mean Value Theorem and its applications. Sketching graphs. Indeterminate forms and L'Hospital's rules. Exponential growth and decay. Definite integral. Fundamental Theorem Calculus. Substitution and areas between curves. Formal definition of natural logarithm function.

Course Grading and Exam Dates:
- **Quizzes   : %5, in recitation.**
- **Midterm 1   : %30, on Sunday, 24 March at 13:30.**
- **Midterm 2   : %30, on Saturday, 11 May at 13:30.**
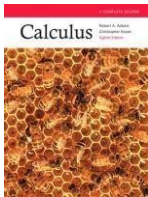- **Final   : %40, TBA.**
- **Make-up Exam: TBA**

Course Coordinator: Ömer KÜÇÜKSAKALLI

Lecture Hours and Places:

Section	Instructor	Lecture Times and Places
2	Ömer KÜÇÜKSAKALLI	Tuesday 8:40-10:30 (YP-A1), Thursday 8:40-10:30 (YP-A1)

Office Hours: Ömer Küçüksakallı, Wednesday 8:40-10:30, M141

Course Textbook:

CALCULUS, Adams and Essex
A Complete Course Calculus. Eight Edition. (or higher editions)
ISBN 978 0-321-78107-9
QA303.2.A33 2013

Reference Books: Calculus, Stewart, Eighth Edition

Course Home Page: https://ma117.math.metu.edu.tr/

Contact: wwwma117@metu.edu.tr
(Only the e-mails sent to wwwma117@metu.edu.tr will be answered.)

Week	Dates	MATH 117 Tentative Syllabus (2023-2)	
1	Feb 19-23	**Ch 0: Preliminaries** *0.1 Real Numbers and the Real Line* *0.3 Graphs of Quadratic Equations* *0.5 Combining Functions to Make New functions* *0.7 The Trigonometric Functions*	*0.2 Cartesian Coordinates in the Plane* *0.4 Functions and Their Graphs* *0.6 Polynomials and Rational Functions*
2	Feb 26-Mar 1 **(Add-Drop and** **Advisor Approvals)**	**Ch 1: Limits and Continuity** 1.2 Limits of Functions 1.3 Limits at Infinity and Infinite Limits	**1.2:** 2, 3, 4, 5, 6, 11, 13, 18, 22, 24, 32, 56, 58, 61, 62, 63, 64 **1.3:** 3, 6, 10, 14, 20, 25, 29, 33, 34, 50, 51
3	Mar 4-8	1.4 Continuity 1.5 The Formal Definition of Limit	**1.4:** 1, 2, 3, 4, 5, 6, 9, 13, 16, 18, 22, 30, 32
4	Mar 11-15	**Ch 2: Differentiation** 2.1 Tangent Lines and Their Slope 2.2 The Derivative 2.3 Differentiation Rules	**2.1:** 3, 5, 9, 13, 15, 17, 19, 21, 23 **2.2:** 1, 3, 11, 17, 23, 25, 27, 31, 35, 37, 41, 43, 45, 47, 49 **2.3:** 7, 9, 11, 13, 15, 17, 23, 25, 29, 33, 37, 39, 43, 49, 51, 53
5	Mar 18-22	2.4 The Chain Rule 2.5 Derivatives of Trigonometric Functions 2.6 Higher-Order Derivatives **MT1:24.03.2024 at 13:30**	**2.4:** 3, 5, 11, 13, 15, 19, 23, 25, 31, 37, 45 **2.5:** 3, 5, 11, 17, 21, 27, 29, 35, 37, 41, 43, 45, 49, 53, 55, 57, 62 **2.6:** 1, 7, 11, 13, 21, 25, 26
6	Mar 25-29	2.8 The Mean-Value Theorem 2.9 Implicit Differentiation	**2.8:** 1, 3, 5, 7, 9, 11, 15 **2.9:** 3, 7, 9, 11, 13, 17, 21, 27
7	Apr 1-5	**Ch 3: Transcendental Functions** 3.1 Inverse Functions 3.2 Exponential and Logarithmic Functions 3.3 The Natural Logarithm and Exponential	**3.1:** 3, 9, 12, 17, 19, 23, 26, 29, 34 **3.2:** 7, 17, 26, 31, 32, 35 **3.3:** 5, 8, 13, 17, 33, 35, 41, 44, 48, 52, 57, 59, 63, 65
8	Apr 8-12	Holiday Apr 10-Apr 12	
9	Apr 15-19	3.3 The Natural Logarithm and Exponential 3.5 The Inverse Trigonometric Functions	**3.3:** 5, 8, 13, 17, 33, 35, 41, 44, 48, 52, 57, 59, 63, 65 **3.5:** 7, 9, 11, 15, 24, 31, 35, 39, 47
10	Apr 22-26	**Ch 4: More Applications of Differentiation** 4.1 Related Rates 4.3 Indeterminate Forms 4.4 Extreme Values	**4.1:** 1, 2, 3, 4, 5, 6, 7, 13, 14, 22, 26 **4.3:** 1, 3, 5, 7, 9, 13, 15, 17, 19, 24, 26, 28 **4.4:** 1, 3, 5, 7, 8, 11, 13, 17, 19, 21, 25, 29, 31, 35, 39
11	Apr 29- May 3	4.4 Extreme Values 4.5 Concavity and Inflections	**4.4:** 1, 3, 5, 7, 8, 11, 13, 17, 19, 21, 25, 29, 31, 35, 39 **4.5:** 1, 3, 5, 7, 9, 11, 13, 14, 16, 17, 19, 25, 27, 29, 31, 35, 39
12	May 6-May 10	4.5 Concavity and Inflections 4.6 Sketching the Graph of a Function 4.8 Extreme-Value Problems **MT2:11.05.2024 at 13:30**	**4.5:** 1, 3, 5, 7, 9, 11, 13, 14, 16, 17, 19, 25, 27, 29, 31, 35, 39 **4.6:** 1, 2, 3, 4, 5, 6, 15, 16, 17, 18, 29, 31 **4.8:** 1, 3, 7, 9, 11, 13, 17, 18, 21, 31, 32, 42
13	May 13-May 17	4.9 Linear Approximations **Ch 5: Integration** 5.1 Sums and Sigma Notation 5.2 Areas as Limits of Sums	**4.9:** 1, 3, 5, 7, 9, 11, 15, 17, 21 **5.1:** 3, 5, 11, 13, 17, 21, 31, 33 **5.2:** 3, 7, 13, 17, 19
14	May 20-May 24	5.3 The Definite Integral 5.4 Properties of the Definite Integral 5.5 The Fundamental Theorem of Calculus	**5.3:** 2, 3, 5, 7, 11, 13, 15, 17 **5.4:** 1, 2, 7, 9, 11, 13, 15, 17, 19, 21, 25, 29, 31, 35, 36, 37, 39 **5.5:** 3, 7, 11, 13, 15, 17, 19, 23, 27, 29, 31, 33, 37, 39, 41, 43, 45, 46, 47, 49, 51, 52, 53, 54
15	May 27-May 31	5.5 The Fundamental Theorem of Calculus 5.6 The Method of Substitution 5.7 Areas of Plane Regions	**5.5:** 3, 7, 11, 13, 15, 17, 19, 23, 27, 29, 31, 33, 37, 39, 41, 43, 45, 46, 47, 49, 51, 52, 53, 54 **5.6:** 1, 3, 5, 7, 8, 9, 10, 11, 12, 13, 15, 17, 18, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 40, 41, 43, 44, 45, 47, 48, 49, 50, 51 **5.7:** 3, 5, 9, 11, 15, 17, 19, 21, 23, 29

Final Exam: TBA

MATH 117 Course Policies (2023-1)

This document contains some information that you need to know about the structure of the **MATH 117 (Calculus I)** course. More information will be announced on the course home page and the ODTÜClass page. All students enrolled in this course are supposed to follow these websites regularly.

Lectures and Recitations

Lectures and recitations are delivered as scheduled in [View Program Course Details (64).](#) Keep in mind that this course is **6 (=4+2) hours per week**.

The first 4 (=2+2) hours are for **lectures** and the last 2 hours are for **recitations**. See the announcement "[What is a section/subsection?](#)" on the MATH117 web page for details about sections and subsections.

Class Attendance

Attendance is not required, but you are strongly recommended to attend the lectures and recitations.

Make-Up for Exams and Assignments

There will be only one general make-up exam containing all topics. The structure of the make-up exam MAY OR MAY NOT be like the midterms and the final. There will be an announcement shortly after the final exam, including the format of the make-up exam and the application procedures. To be able to take the make-up exam, you must present a reasonable excuse (such as a medical report or an academic leave).

After the final exam, you will be able to apply to take the make-up exam through a form on ODTÜClass.

The worst quiz score will be dropped and there will be no make-up for quizzes.

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 ODTÜ Disability Support Office and/or course instructor and the advisor of students with disabilities at academic departments (for the list, see 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 documents."