MATH 117 (Calculus I)
Fall 2022

Frequency: Fall/Spring Terms

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

Catalog 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. Fundamental Theorem of Calculus. Substitution. Areas between curves. Formal definition of natural logarithm function. Techniques of integration.

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Course Grading:
- Midterm 1   : 30%   (November 19, 2022 at 09:30)
- Midterm 2   : 30%   (December 24, 2022 at 09:30)
- Final Exam   : 40%   (January 12, 2023 at 09:30)
- Quiz   : 5%   (during recitations)

Textbook:

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

Reference Books: Calculus, James Stewart, Eighth Edition

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

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Week	Dates	MATH 117 Syllabus (Fall 2022)	
1	Oct. 3—7	**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	Oct. 10—14 **(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	Oct. 17—21	1.4 Continuity 1.5 The Formal Definition of Limit (optional)	**1.4:** 1, 2, 3, 4, 5, 6, 9, 13, 16, 18, 22, 30, 32
4	Oct. 24—28 **(October 29, Republic Day)**	**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	Oct. 31—Nov. 4	2.4 The Chain Rule 2.5 Derivatives of Trigonometric Functions 2.6 Higher-Order Derivatives	**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	Nov. 7—11 **(November 10, Commemoration of Atatürk)**	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	Nov. 14—18	**Ch 3: Transcendental Functions** 3.1 Inverse Functions 3.5 The Inverse Trigonometric Functions 3.2 Exponential and Logarithmic Functions **Midterm 1: November 19, 2022 at 09:30**	**3.1:** 3, 9, 12, 17, 19, 23, 26, 29, 34 **3.5:** 7, 9, 11, 15, 24, 31, 35, 39, 47 **3.2:** 7, 17, 26, 31, 32, 35
8	Nov. 21—25	3.2 Exponential and Logarithmic Functions 3.3 The Natural Logarithm and Exponential	**3.2:** 7, 17, 26, 31, 32, 35 **3.3:** 5, 8, 13, 17, 33, 35, 41, 44, 48, 52, 57, 59, 63, 65
9	Nov. 28—Dec. 02	**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
10	Dec. 5—9	4.4 Extreme Values 4.5 Concavity and Inflections 4.6 Sketching the Graph of a Function	**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 **4.6:** 1, 2, 3, 4, 5, 6, 15, 16, 17, 18, 29, 31
11	Dec. 12—16	4.8 Extreme-Value Problems 4.9 Linear Approximations **Ch 5: Integration** 5.1 Sums and Sigma Notation	**4.8:** 1, 3, 7, 9, 11, 13, 17, 18, 21, 31, 32, 42 **4.9:** 1, 3, 5, 7, 9, 11, 15, 17, 21 **5.1:** 3, 5, 11, 13, 17, 21, 31, 33
12	Dec. 19—23	5.2 Areas as Limits of Sums 5.3 The Definite Integral **Midterm 2: December 24, 2022 at 09:30**	**5.2:** 3, 7, 13, 17, 19 **5.3:** 2, 3, 5, 7, 11, 13, 15, 17
13	Dec. 26—30	5.4 Properties of the Definite Integral 5.5 The Fundamental Theorem of Calculus	**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
14	Jan. 2—6	Anti-derivatives (from 2.10) 5.6 The Method of Substitution 5.7 Areas of Plane Regions	**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: January 12, 2023 at 09:30

MATH 117 Course Policies (Fall 2022)

This document contains all the information 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 ODTUClass page. All students enrolled in this course are supposed to follow these websites regularly.

The MATH 117 coordination reserves the right to make necessary changes in this policy depending on situations which are out of our control. So it is your responsibility to follow the announcements in the webpage of the course 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 "schedule of lectures" in the "Announcements" tab on the MATH117 web page.

For details about sections and subsections, see the page: [What is a section/subsection?](#)

Class Attendance
Attendance during lectures and recitations will not be taken. However, you are strongly suggested to attend the lectures and recitations. You are required to attend the recitation section in which you are registered. There will be frequent pop-up quizzes in recitation hours.

Make-Up for Exams and Assignments
You can take 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).

After the final exam, there will be a form on ODTÜClass and via that form, you will apply to take the make-up exam instead of one missed exam and you will send your reasonable excuse to **wwwma117@metu.edu.tr**.

Final Exam Entrance Conditions and NA Grade
If your two midterm scores (each one out of 100 points) add up to less than 20 points (out of 200 points in total), then you cannot take the final exam and will receive an NA grade from the course.

If you do not take the final exam and if you do not have the right to take the make-up exam for the final, you will receive an NA grade.

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, 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 Honour Code is as follows: "Every member of METU community adopts the following honour 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 honourable 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."