MATH 117 (Calculus I)
Fall 2024 (2024-1)

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:
- Midterm 1: 30 % (November 16, 2024 Saturday at 09:30)
- Midterm 2: 30 % (December 21, 2024 Saturday at 09:30)
- Final: 40 % (TBA)
- Quizes: 5 % (during Recitations)

Course Coordinator: Songül Kaya Merdan (wwwma117@metu.edu.tr)

Lecture Hours and Places:

Section	Instructor	Lecture Times and Places
1	Songül Kaya Merdan	Monday 13:40-15:30 U3 Thursday 10:40-12:30 U3
2	Recep Özkan	Tuesday 08:40-10:30 G111 Thursday 08:40-10:30 G111

Course Assistant: Melis Aslan (wwwma117@metu.edu.tr)

Course Textbook:

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/

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

Week	Dates	MATH 117 Tentative Syllabus (2024-1)	
1	Sep 30 - Oct 4	**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 7 - Oct 11 **(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 14 - Oct 18	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	Oct 21 - Oct 25	**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 28 - Nov 1 **October 29, Republic Day**	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 4 - Nov 8	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 11 - Nov 15 **November 10, Commemoration of Atatürk**	**Ch 3: Transcendental Functions** 3.1 Inverse Functions 3.2 Exponential and Logarithmic Functions 3.3 The Natural Logarithm and Exponential **Midterm 1: Nov 16, 2024**	**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	Nov 18 - Nov 22	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
9	Nov 25 - Nov 29	**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 2 - Dec 6	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
11	Dec 9 - Dec 13	4.5 Concavity and Inflections 4.6 Sketching the Graph of a Function 4.8 Extreme-Value Problems	**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
12	Dec 16 - Dec 20	4.9 Linear Approximations **Ch 5: Integration** 5.1 Sums and Sigma Notation 5.2 Areas as Limits of Sums **Midterm 2: Dec 21, 2024**	**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
13	Dec 23 - Dec 27	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
14	Dec 30 - Jan 3 **January 1, New Year's Day**	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 (2024-1)

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 recommended to attend the lectures and recitations.

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**.

Eligibility to take the Final Exam and NA Grade

If your two midterm scores (each one out of 100 points) add up to less than 10 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 did not attend the Final Exam and if you do not have the right to take make-up exam for Final, you will receive an NA grade.

Who gets NA grade?

(A) Before the final exam, students will be categorized in the following way:

1) M1 + M2 **>= 10**

2) M1 + M2 **< 10**,

for which M1 is the Midterm 1 score out of 100, and M2 is the Midterm 2 score out of 100.

- Students in group **1** will be able to take the final exam.
- Students in group **2** will **NOT** be able to take the final exam. They will get an automatic NA grade.

Examples:

a) Student A attends to Midterm 1 and his score is 10. He/she does not take Midterm 2 being on leave for academic/medical reasons. Since M1+M2 = 10 **>= 10**, He/she is eligible for the final exam. If

he/she submits relevant documents, it is also possible to take make-up exam which is given after the final. *No problem at all.*

b) Student B does not attend to Midterm 1 because of their illness. He/she attends to Midterm 2 and get 8 points. Since M1+M2 = 8 **<** 10, he/she won't be able to take final exam and get **NA** grade. **It should be in mind that in this example, taking make-up for Midterm is not possible even if he/she has an appropriate official document (academic/medical report etc.).**

(B) According to the university's rules and regulations governing undergraduate studies (Article 24),

"…The grade NA is designated due to one of the conditions below. The grade NA is processed as FF in the calculation of the Grade Point Average.

1) Not fulfilling the attendance requirements for the theoretical and practical course hours as indicated in the course schedule.

2) Not qualifying to take the final exam due to failure in fulfilling the provisions regarding course practices.

3) Having taken none of the mid-term and final examinations.

…"

Note that each instructor/the coordination of the course reserves the right to determine whether the attendance requirements indicated in the above policy (B-1) applies to the students of their section or not.

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 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."