MATH 119
Calculus with Analytic Geometry

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. Improper integrals. Arc length. Volumes and surface areas of solids of revolution. Parametric plane curves. Polar coordinates. Arc length in polar coordinates.

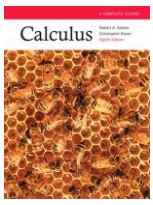
Course Objectives: The sequence Math 119-120 is the Standard complete introduction to the concepts and methods of calculus. It is taken by all engineering students. The emphasis is on concepts, solving problems, theory and proofs. All sections are given a uniform midterm and a final exam. Students will develop their reading, writing and questioning skills in Mathematics.

Course Coordinator: Dr. Kadri İlker Berktav

MidTerm1:	30%	**(November 15th 2025 at 09:30)**
MidTerm2:	30 %	**(December 20th 2025 at 09:30)**
Final Exam:	40 %	**(January 8th 2026 at 09:30)**

10 points BONUS (during Recitations) : Quizzes (5 points) + Attendance (2 points) + Homeworks (3 points)

Suggested textbook:



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

Reference Books: Calculus, James Stewart, Fifth or a Higher Edition

Current Semester Course Home Page: http://www.ma119.math.metu.edu.tr/

Contact: wwwma119@metu.edu.tr

Only the e-mails sent to wwwma119@metu.edu.tr will be answered. Mass e-mails will be ignored.

Week	Dates	MATH 119 Syllabus 2025-2026 Fall (2025-1)	
1	Sep.29-Oct.03	Ch 0: Preliminaries *0.1 Real Numbers and the Real Line* *0.2 Cartesian Coordinates in the Plane* *0.3 Graphs of Quadratic Equations* *0.4 Functions and Their Graphs* *0.5 Combining Functions to Make New functions* *0.6 Polynomials and Rational Functions* *0.7 The Trigonometric Functions*	
2	Oct.06-10 **Add-Drop and Advisor Approvals**	Ch 1: Limits and Continuity 1.2 Limits of Functions 1.3 Limits at Infinity and Infinite Limits 1.4 Continuity	***SUGGESTED PROBLEMS FROM EIGTH EDITION*** **1.2 :** 2, 3, 4, 5, 6, 11, 13, 18, 22, 24, 32, 36, 56, 58, 61, 62, 63,64, 67, 68, 75 **1.3 :** 3, 6, 9, 10, 14, 20, 25, 29, 33, 34, 50, 51 **1.4 :** 1, 2, 3, 4, 5, 6, 9, 13, 16, 18, 22, 30, 32
3	Oct.13-17	1.5 The Formal Definition of Limit Ch 2: Differentiation 2.1 Tangent Lines and Their Slopes 2.2 The Derivative	**1.5 :** 4, 6, 8,10, 12 **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
4	Oct.20-24	2.3 Differentiation Rules 2.4 The Chain Rule 2.5 Derivatives of Trigonometric Functions 2.6 Higher-Order Derivatives 2.9 Implicit Differentiation	**2.3 :** 7, 9, 11, 13, 15, 17, 23, 25, 29, 33, 37, 39, 43, 49, 51 **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 **2.9 :** 3, 7, 9, 11, 13, 17, 21, 27
5	Oct.27-Oct.31 **October 29, Republic Day**	2.8 The Mean-Value Theorem Ch 3: Transcendental Functions 3.1 Inverse Functions	**2.8 :** 1, 3, 5, 7, 9, 11, 15, 33 **3.1 :** 3, 9, 12, 17, 19, 23, 26, 29, 30, 34, 35, 36
6	Nov.03-07	3.3 The Natural Logarithm and Exponential 3.2 Exponential and Logarithmic Functions 3.5 The Inverse Trigonometric Functions	**3.2 :** 7, 17, 26, 31, 32 **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
7	Nov.10-14	Ch 4: More Applications of Differentiation 4.1 Related Rates 4.3 Indeterminate Forms **Midterm-I November 15th 2025 at 09:30**	**4.1 :** 1, 2, 3, 4, 5, 6, 7, 13, 14, 20, 22, 26, 28, 35, 37 **4.3 :** 1, 2, 3, 5, 7, 8, 9, 10, 13, 15, 17, 19, 24, 25, 26, 28, 29
8	Nov.17-21	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, 24, 25, 26, 27, 29, 31, 34, 35, 38, 39, 49 **4.5 :** 1, 3, 5, 7, 9, 11, 13, 14, 16, 17, 19, 25, 27, 29, 31, 33, 35, 36, 39 **4.6 :** 1, 2, 3, 4, 5, 6, 15, 16, 17, 18, 24, 29, 31, 36, 38
9	Nov.24-28	4.8 Extreme-Value Problems 4.9 Linear Approximations Ch 5: Integration 5.1 Sums and Sigma Notation 5.2 Areas as Limits of Sums 5.3 The Definite Integral	**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 **5.2:** 3, 7, 13, 17, 19 **5.3:** 2, 3, 5, 7, 11, 13, 15, 17
10	Dec.01-05	5.4 Properties of the Definite Integral 2.10 Antiderivatives and the Indefinite Integral 5.5 The Fundamental Theorem of Calculus 5.6 The Method of Substitution	**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 **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
11	Dec.08-12	5.7 Areas of Plane Regions Ch 6: Techniques of Integration 6.1 Integration by Parts 6.2 Integrals of Rational Functions 6.3 Inverse Substitutions	**6.1:** 5, 7, 10, 11, 13, 15, 17, 19, 21, 23, 25, 27, 28, 29, 33, 37 **6.2:** 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31 **6.3:** 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 44, 45, 47, 49, 51
12	Dec.15-19	6.5 Improper Integrals **(including Limit Comparison Test and Absolute Convergence)** **Midterm-II December 20th 2025 at 09:30**	**6.5:** 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 24, 25, 31, 33, 35, 37, 39, 41, 42
13	Dec.22-26	Ch 7: Applications of Integration 7.1 Volumes by Slicing-Solids of Revolution	**5.7:** 3, 5, 9, 11, 15, 17, 19, 21, 23, 29 **7.1:** 1, 3, 7, 11, 13, 15, 19
14	Dec.29-Jan.02 **Jan. 1, New Year**	7.3 Arc Length and Surface Area 8.5 Polar Coordinates and Polar Curves Review **Final Exam January 8th 2026 at 09:30**	**7.3:** 3, 5, 7, 9, 11, 13, 14, 21, 24, 25, 27, 28, 29 **8.5:** 3, 4,5, 7, 9, 11, 13, 16,18, 22, 26

MATH 119 Course Policy (2025-1)

This document/announcement contains all the necessary information that you need to know about the structure of the ***MATH 119: Calculus with Analytic Geometry*** *course*. More information will be announced on the official website of the course and the ODTUCLASS page. All students enrolled in this course are supposed to follow these websites regularly.

MATH119 Coordination reserves the right to make necessary changes in this policy depending on the 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 announced in **Schedule of Lectures** on the official website of the course. Keep in mind that this course is **6 (=4+2) hours per week**.
The first 2+2=4 hours are for **lectures** and the last 2 hours are for **recitations**. See "the schedule of lectures"- tab on the MATH119 web page when available.
For details about sections and subsections, see the page: What is a section/subsection?

Class Attendance

You are **expected** to attend all lectures and recitations. No attendance will be taken in lecture hours. However, there might be an attendance policy during recitations (to be announced via ODTÜClass). Also there will be frequent pop quizzes in recitation hours.

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).
After the final exam, there will be a form on ODTÜClass and via that form, you will apply the make-up exam instead of one missed exam and will send your reasonable excuse to **wwwma119@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 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 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 >= 20

2) M1 + M2 < 20,

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 20. He/she does not take Midterm 2 being on leave for academic/medical reasons. Since M1+M2 = 20 >= 20, 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 18 points. Since M1+M2 = 18 < 20, 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: 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."