Fall 2021   EMT103/MATE 103 Calculus I

Instructor: Dr. Elçin Emre-Akdoğan	**Time and Place:** Tuesday 13:00-15:00 (G105) Wednesday 13:00-15:00 (G105) Thursday 11:00-12:00 (DB18)
Office Hours: by appointment	**Textbook:** *Thomas' Calculus,* 11th Edition by Thomas, Weir, Hass,& Giordano, and Lecture Notes
Office: GB24	**Program:** Desmos/Geogebra
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Prerequisites: Single Variable Calculus is a first-year, first-semester course. The prerequisites are high school algebra and trigonometry. Prior experience with calculus is helpful but not essential.

Course Description: This introductory calculus course covers basic concepts of Calculus- functions, limits, derivative and inform about applications. Topics include:

- Functions
- Concept of limit and continuity and their applications
- Concept of derivative, applications of derivative and graph drawing

Course objectives:
The aim of this course is to introduce the students with the basic conceptual tools of calculus- functions, limits, derivative and integration. The course also aims to inform students about applications and develop their mathematical thinking as well as modelling techniques.

Learning Outcomes:
Upon successful completion of this course, students will be able to:

- explain the concept of limit in one variable functions,
- interpret the concept of continuity in one variable functions,
- interpret geometrically the concept of derivative in one variable functions,
- use the rules of derivative in one variable functions,
- explain the concept of integration in one variable functions,
- use integration techniques make integration in one variable functions,
- calculate the area and volume by using integration in one variable functions.

Methods for Assessment of Learning Outcomes: The expected learning outcomes for the course will be assessed through graded activities and ungraded activities. The graded activities include midterm exam, final exam, and homework. The ungraded activities will be used to monitor your progress. A variety of these ungraded assessment techniques may be employed, including problems to be completed during class, direct questioning of students, answering students questions in class, and discussions during office hours.

Attendance: This course requires strong involvement and attendance. You are responsible for all information given out during the courses. Exceeding 20% of attendance with unexcused absences will result a half letter grade reduction. You are expected to arrive on time for the lectures.

Communication: All announcements will be sent to your e-mail address through Moodle. Check your e-mails regularly in order to be informed.

Grades: Your final grade will be weighted as follows:

25%	Homework	
35%	Midterm Exam	Date and Location to be Announced
40%	Final Exam	Date and Location to be Announced

Midterm Exam: <mark>Date:</mark>
Content for Take-Home Midterm: 1.3, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6

Final Exam: Date and location will be announced
Content for Take-Home Final: 2.7, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6

Homework: As in all mathematics courses, working on problems is the key to success. It is also vital to work on problems on a regular basis. Each assignment will be due at the **beginning** of the following class.

You need to upload your homework to moodle, your document's title should be NAME_SURNAME_HomeworkX (X: Number of the homework)

Homework Exercises will be from the textbook. Each assignment will be graded on a scale of 0-10.

Solutions to homework exercises will be posted after the class during which they have been uploaded.
<u>Late Homework Policy:</u>

Homework is due at the **beginning** of class.

Late homework **will** be accepted at any time, subject to the following conditions:

- The word "LATE" must be written at the top of the assignment.
- Only half credit will be awarded, solely based on effort.

Academic Honesty: It hardly needs to be said that such things as plagiarism or stealing another student's work are unacceptable. However, in this class, it is entirely proper to work in teams to do discussion on the problems or the problem solving, as long as you yourself have mastery of those answers and are prepared on your own to present them in class.

Plagiarism is a serious breach of academic trust. In academic work, our words and ideas are the value of our work, so turning in someone else's work as if it were your own is a form of theft. When you use someone else's words and ideas--whether it's the work of a famous writer or a fellow student--without crediting the source or authorship of those words and ideas, you are plagiarizing. So here's the bottom line: original work only, credit to ideas, writing, or words from someone other than you.

COURSE SCHEDULE

SCHEDULE			
Date	**Topic**	**Content**	**Next lesson**
Week 1 Session 1 (05/10/2021)	Introduction	- The introduction of the course -What is Calculus?	No assignment
Week 1 Session 2 (06/10/2021)	Function	-Definition of function and drawing the graphs (1.3) -Types of function and composite function (1.4 and 1.5) https://www.geogebra.org/m/ussndp3t https://www.geogebra.org/m/Xc8XRRHs	No assignment
Week 1 Session 3 (07/10/2021)	Function	Types of function and composite function (1.4 and 1.5)	No assignment
Week 2 Session 1 (12/10/2021)	Limit	-Informal definition of limit (2.1)	No assignment
Week 2 Session 2 (13/10/2021)	Limit	-Informal definition of limit (2.1)	No assignment
Week 2 Session 3 (14/10/2021)	Limit	- Limit Laws (2.2) https://www.geogebra.org/m/dkvgEK88	No assignment
Week 3 Session 1 (19/10/2021)	Limit	- Limit Laws (2.2) https://www.geogebra.org/m/dkvgEK88	*Homework assignment from textbook (2.2)
Week 3 Session 2 (20/10/2021)	Limit	-Precise definition of limit (2.3) https://www.geogebra.org/m/ywm3nudv https://www.geogebra.org/m/Q7Zmdn6j	No assignment
Week 3 Session 3 (21/10/2021)	Limit	-Precise definition of limit (2.3) https://www.geogebra.org/m/ywm3nudv https://www.geogebra.org/m/Q7Zmdn6j	*Homework assignment from textbook (2.3)
Week 4 Session 1			

(26/10/2021)			
Week 4 **Session 2** **(27/10/2021)**	Limit	- One-sided limits, limits at infinity and infinite limits (2.4) https://www.geogebra.org/m/Tz5BHBcj#material/PSrua4JF https://www.geogebra.org/m/Tz5BHBcj#material/YfREF7Px	No assignment
Week 4 **Session 3** **(28/10/2021)**	Limit	- One-sided limits, limits at infinity and infinite limits (2.4) https://www.geogebra.org/m/Tz5BHBcj#material/PSrua4JF https://www.geogebra.org/m/Tz5BHBcj#material/YfREF7Px	*Homework assignment from textbook (2.4)
Week 5 **Session 1** **(02/11/2021)**	Limit	- One-sided limits, limits at infinity and infinite limits (2.5) https://www.geogebra.org/m/Tz5BHBcj#material/PSrua4JF https://www.geogebra.org/m/Tz5BHBcj#material/YfREF7Px	No assignment
Week 5 **Session 2** **(03/11/2021)**	Limit	- One-sided limits, limits at infinity and infinite limits (2.5) https://www.geogebra.org/m/Tz5BHBcj#material/PSrua4JF https://www.geogebra.org/m/Tz5BHBcj#material/YfREF7Px	*Homework assignment from textbook (2.5)
Week 5 **Session 3** **(04/11/2021)**	Continuity	-Definition of continuity and its applications (2.6) https://www.geogebra.org/m/Tz5BHBcj#material/Qfzd7aA6	No Assignment
Week 6 **Session 1** **(09/11/2021)**	Continuity	-Definition of continuity and its applications (2.6) https://www.geogebra.org/m/Tz5BHBcj#material/Qfzd7aA6	No Assignment
Week 6 **Session 2** **(10/11/2021)**	Continuity	-Definition of continuity and its applications (2.6) https://www.geogebra.org/m/Tz5BHBcj#material/Qfzd7aA6	*Homework assignment from textbook (2.6)
Week 6 **Session 3** **(11/11/2021)**	Derivative	- Tangent and derivatives (2.7) https://www.geogebra.org/m/SrteVwW6 https://www.geogebra.org/m/qHekNnSS	No Assignment
Week 7 **Session 1** **(16/11/2021)**	Derivative	- Tangent and derivatives (2.7) https://www.geogebra.org/m/SrteVwW6 https://www.geogebra.org/m/qHekNnSS	No Assignment
Week 7	Derivative	- Tangent and derivatives (2.7)	*Homework assignment from

Session 2 (17/11/2021)		https://www.geogebra.org/m/SrteVwW6 https://www.geogebra.org/m/qHekNnSS	textbook (2.7)
Week 7 Session 3 (18/11/2021)	Derivative	-Derivative as a function (3.1)	No Assignment
Week 8 Session 1 (23/11/2021)	Derivative	-Derivative as a function (3.1)	*Homework assignment from textbook (3.1)
Week 8 Session 2 (24/11/2021)	Derivative	Differentiation Rules (3.2)	No Assignment
Week 8 Session 3 (25/11/2021)	Derivative	Differentiation Rules (3.2)	*Homework assignment from textbook (3.2)
Week9 Session 1 (30.11.2021)	Derivative	- Derivatives of trigonometric functions (3.4)	No Assignment
Week9 Session 2 (01.12.2021)	Derivative	- Derivatives of trigonometric functions (3.4)	*Homework assignment from textbook (3.4)
Week 9 Session 3 (02/12/2021)	Derivative	-Chain Rule (3.5)	No Assignment
Week 10 Session 1 (07/12/2021)	Derivative	-Chain Rule (3.5)	*Homework assignment from textbook (3.5)
Week 10 Session 2 (08/12/2021)	Derivative	-Implicit Differentiation (3.6)	No Assignment
Week 10 Session 3 (09/12/2021)	Derivative	-Implicit Differentiation (3.6)	*Homework assignment from textbook (3.6)
Week 11 Session 1 (14/12/2021)	Derivative	Related Rates (3.7)	No Assignment
Week 11 Session 2 (15/12/2021)	Derivative	Related Rates (3.7)	*Homework assignment from textbook (3.7)
Week 11 Session 3 (16/12/2021)	Derivative	-Extreme Values of Functions (4.1)	No Assignment
Week 12 Session 1 (21/12/2021)	Derivative	-Extreme Values of Functions (4.1)	*Homework assignment from textbook (4.1)
Week 12 Session 2 (22/12/2021)	Derivative	-Mean Value Theorem (4.2)	No Assignment
Week 12 Session 3 (23/12/2021)	Derivative	-Mean Value Theorem (4.2)	*Homework assignment from textbook (4.2)

Week 13 **Session 1** **(28/12/2021)**	Derivative	-Monotic Functions and the First Derivative Test (4.3)	No Assignment
Week 13 **Session 2** **(29/12/2021)**	Derivative	-Monotic Functions and the First Derivative Test (4.3)	*Homework assignment from textbook (4.3)
Week 13 **Session 3** **(30/12/2021)**	Derivative	-Concavity and Curve Sketching (4.4)	No Assignment
Week 14 **Session 1** **(04/01/2022)**	Derivative	-Concavity and Curve Sketching (4.4)	*Homework assignment from textbook (4.4)
Week 14 **Session 2** **(05/01/2022)**		Exit Ticket Activity	
Week 14 **Session 3** **(06/01/2022)**		Exit Ticket Activity	