Fall 2019　　　　MATE 103 Calculus I

Instructor: Dr. Elçin Emre-Akdoğan	**Place:** A231
Office Hours: by appointment	**Textbook:** *Thomas' Calculus,* 11th Edition by Thomas, Weir, Hass,& Giordano, Lecture Notes
Office: G104	**Program:** Desmos/Geogebra
Email: elcin.akdogan@tedu.edu.tr	**Time:** Thursday 09:00-11:00

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:

- Sets and number systems
- Concept of relation
- Types of functions, exponential functions and logarithmic 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 concepts of Calculus-functions, limits, derivative and inform about applications and develop students' mathematical thinking, modeling techniques.

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

- Explain fundamental principles of sets, number systems, concept of relation, types of function, exponential and logarithmic functions.
- Apply the procedural properties.
- Explain concept of limit in one variable functions.
- Interpret concept of continuity in one variable functions.
- Interpret concept of derivative geometrically in one variable functions. Calculate a derivate by using methods in one variable calculus.
- Do the applications of derivative in one variable functions.
- Draw graphs of 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 exams, homework, quiz, and photo-math project. 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:

15%	Homework	
10%	PhotoMath Project	Details will be given during the course
15%	Quizzes	Date and Location to be Announced
25%	Midterm Exam	Date and Location to be Announced
35%	Final Exam	Date and Location to be Announced

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.

Homework Exercises will be from the textbook and Mathematica. One exercise will be chosen at random from each assignment and graded on a scale of 0-10.

Solutions to homework exercises will be posted after the class during which they have been collected.

<u>Late Homework Policy:</u>

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

- If you are not in class when homework is collected, your homework will be considered late.
  This includes lateness due to oversleeping, traffic, and parking availability.
- If you pass homework in at the end of class on the day it is due, it will be considered late.
- If you can not make it to class, **you are responsible** for turning in the assignment early or finding someone to drop it off in class for you.
- Only under severe circumstances will late homework be accepted for full credit, for example, involvement in a traffic accident, or illness requiring medical attention.

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 (26/09/2019)	Introduction	- The introduction of the course -What is Claculus?	No assignment
Week 2 (03/10/2019)	Sets Number systems Concept of relation	-Definition of sets, operation on sets, rules of set theory -Introducing number systems and their properties -Definition of relation and its properties	No assignment
Week 3 (10/10/2019)	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	*Homework assignment from textbook
Week 4 (17/10/2019)	Limit	-Informal definition of limit (2.1)	No assignment
Week 5 (24/10/2019)	Limit	- Limit Laws (2.2) https://www.geogebra.org/m/dkvgEK88	*Homework assignment from textbook
Week 6 (31/10/2019)	Limit	-Precise definition of limit (2.3) https://www.geogebra.org/m/ywm3nudv https://www.geogebra.org/m/Q7Zmdn6j	*Homework assignment from textbook
Week 7 (07/11/2019)	Limit	- One-sided limits, limits at infinity and infinite limits (2.4 and 2.5)	*Homework assignment from textbook
Week 8 (14/11/2019)	Continuity	-Definition of continuity and its applications (2.6)	*Homework assignment from textbook
Week 9 (21/11/2019)	MIDTERM EXAM!		

Week 10 (28/11/2019)	Derivative	- Tangent and derivatives (2.7)	*Homework assignment from textbook * Photo-math project
Week 11 (05/12/2019)	Derivative	-Derivative as a function, Differentiation rules, Derivative as a rate of change (3.1, 3.2, 3.3)	*Homework assignment from textbook
Week 12 (12/12/2019)	Derivative	- Derivatives of trigonometric functions, Chain Rule (3.4, 3.5)	*Homework assignment from textbook
Week 13 (19/12/2019)	Derivative	-Implicit Differentiation (3.6)	*Homework assignment from textbook
Week 14 (26/12/2019)	Derivative	-Applications of derivative	*Homework assignment from textbook