

Repetitio est mater studiorum
(*Repetition Is the Mother of Learning*)
Latin wisdom

Interest comes with success,
and success comes with hard work.
Professor Yaroslav Tagamlizki

Eastern Connecticut State University
MAT 243-02, Calculus I with Technology, Fall 2023

Instructor: Christian Yankov

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Time and Place: **MF** 11:00-11:50 am, and **W** 11:00-12:50 pm, Science 132.

Text: Strang and Herman, *Calculus, Volume 1*, published by OpenStax/XanEdu, **ISBN: 978-1-938168-02-4**. This is an open source textbook. An electronic version of the book may be downloaded free of charge at <https://openstax.org>.

Calculator: An advanced graphics calculator **TI-89** is required for this course (no cell phone calculators). Calculator use may be restricted on exams.

Office hours: **MF:** 10:00-11:00 am and 12:00-1:00 pm, **W:** 10:00-11:00 am.

Prerequisites: MAT 155(P) or placement at this level.

Course description: A first course in calculus with a focus on differential calculus. Topics include the study of limits, continuity, rates of change, the definition of the derivative, indeterminate forms, and techniques of differentiation of linear, polynomial, exponential, logarithmic, rational, and trigonometric functions. The course will include applications of the derivative to solve applied problems. Characteristics of functions such as intervals of increase or decrease, concavity, extrema, and end behavior will be studied as a means to describe, reason, interpret, and analyze relationships. The course concludes with an introduction to antiderivatives. Use of an approved graphing calculator is required throughout the course.

Class format: Each class meeting will consist of a lecture and include related problem solving. We will also study the use of an advanced calculator in solving calculus problems.

Eastern Liberal Arts Curriculum (LAC) Tier I Mathematics Outcomes: This course meets the Tier I requirements for the Mathematics category of the Liberal Arts Core Curriculum. This course will achieve the following outcomes:

- Use mathematical thinking as a model of deductive reasoning (lecture content, class activities, homework, quizzes, and/or exams);
- Understand the importance of variation - both how a single quantity can vary and how one quantity varies in relation to another (i.e. functional relationships) (lecture content, class activities, homework, quizzes, and/or exams);
- Understand the important mathematical idea of growth (linear, quadratic, exponential, etc.) (lecture content, class activities, homework, quizzes, and/or exams);
- Apply quantitative reasoning to problems encountered in other academic areas (lecture content, class activities, homework, quizzes, and/or exams);
- Use appropriate technology (e.g. graphing calculators, spreadsheets, mathematical manipulation software) to solve quantitative problems (lecture content, class activities, homework, quizzes, and/or exams);
- Effectively communicate ideas orally, visually, and in writing (group activities, student responses to questions during lectures, quizzes, and/or exams);

- Understand the value of rigorous inquiry and research, academic integrity, and active engagement in the ECSU learning community and beyond (contributing to class activities, timely completion of homework, clearly crediting work of others, penalties for violations of academic integrity)
- Discern the ethical dimensions of the production and acquisition of knowledge within disciplines (penalties for violations of academic integrity, contributing to class activities);
- Ability to think critically (lecture content, class activities, homework, quizzes, and/or exams);
- Effectively seek and employ information to achieve academic goals (lecture content, class activities, homework, quizzes, and/or exams).

Ethical Behavior in the Mathematical Sciences: Ethical behavior in the mathematical sciences is embedded throughout the course. The key concepts are discussed in lecture and students demonstrate these principles through various modes such as class activities, group activities and assessments such as homework, quizzes and exams. These key principles include, but are not limited to, clearly crediting work of others and the study of an historic or current mathematical controversy, such as the Newton-Leibniz dispute, involving plagiarism and ownership.

Learning Outcomes: Students in this course will:

1. Understand and calculate limits.
2. Determine whether or not functions are continuous.
3. Understand and calculate rates of change.
4. Know and apply the definition of the derivative.
5. Calculate derivatives using derivative rules.
6. Understand and solve application problems.
7. Use derivatives to describe characteristics of functions.
8. Describe, reason, interpret, and analyze relationships.
9. Understand the basics of antiderivatives.
10. Use technology to graph functions, create tables, evaluate functions, factor and expand expressions, evaluate limits, differentiate, and solve equations.
11. Communicate ideas thoughtfully and clearly both in writing and orally.
12. Work cooperatively with classmates.

Technology Skills: Students should be able to do the following using a TI-89:

1. Graph functions.
2. Evaluate functions; evaluate expressions such as rates of change.
3. Create tables of values for functions.
4. Factor and expand expressions.
5. Do symbolic differentiation.
6. Solve equations for a particular variable.
7. Find sums.
8. Find limits.

Attendance: It is expected that you be there on time for each and every class. If for some reason you should miss a class, then it is your responsibility to find out from a friend what has been covered and assigned and make it up.

Homework: Homework is assigned online through *WebAssign*. Registration instructions for WebAssign will be handed out in a separate info sheet. There will be one online assignment each week due every Sunday at 11:59pm, unless communicated otherwise, or an extension is granted. I cannot stress enough the importance of doing the homework. It is a critical factor in building and reinforcing your knowledge, as well as helping you identify your weak points. It will also be a part of your grade for the class, as explained below.

Exams: There will be two longer exams throughout the semester. Their dates will be announced at least a week in advance.

Final Exam: There will be a cumulative final on **Monday, Dec. 11, 2023, 11:00-1:00 pm.**

Evaluation: Homework will account for 15% of your grade, the two longer exams will account for 25% each, and the final exam will account for the remaining 35%.

Grades: The ranges for the grades are the following:

A-, A	90% and above
B-, B, B+	80% - 89%
C-, C, C+	70% - 79%
D, D+	60% - 69%

How to get help: You should come see me during my office hours, if you have difficulties with the subject matter. You can also get free tutoring at the Mathematics Achievement Center (MAC). It is a part of the Academic Success Center (ASC), which is located on the first floor of the E. J. Smith Library, Room 130. Please visit

<https://www.easternct.edu/mathematical-sciences/mathematics-achievement-center.html>

or call 465-0383 for the schedules of the MAC. If you feel you need help, do not wait until an exam is imminent.

MAC Tutoring: The Mathematics Achievement Center (MAC) will provide both in-person and virtual tutoring for the Spring 2021 semester. In-person tutoring will take place Monday through Friday 9-5pm on the first floor of the J. E. Smith Library, Room 107. The MAC has a Covid cap of 8 students. No appointment is needed for in person tutoring. Virtual tutoring will take place using Webex. Please check the posted schedule on the MAC website

<https://www.easternct.edu/mathematical-sciences/mathematics-achievement-center.html>

for available virtual tutoring. Instructions for virtual tutoring are included on the schedule.

Make-ups: Make-ups for exams are strongly discouraged and might be allowed for truly exceptional reasons only, and with my prior permission.

Students with disabilities: Eastern Connecticut State University is committed to following the requirements of the Americans with Disabilities Act and Section 504 of the Rehabilitation Act. If you are a student with a disability (or think you may have a disability), and require adaptations or accommodations, or assistance evacuating a building in the case of an emergency, please contact the Office of AccessAbility Services (OAS) at 860-465-0189 to discuss your request further. Any student registered with the OAS should contact the instructor as soon as possible for assistance with classroom accommodations. Please note that accommodations are not retroactive, and must be communicated through a Letter of Accommodation which is drafted by the OAS.

Academic Misconduct: Students should read and understand Eastern's Academic Misconduct Policy, which can be found in the student handbook or at the following website:

<https://www.easternct.edu/academic-misconduct/index.html>

All violations will be handled under the procedures established in this policy.

Disclaimer: *The instructor reserves the right to make changes to this syllabus during the semester as necessary.*