

# Calculus I

MATH 125-012 | Spring 2023 | 4 Credit Hours

Lecture

Mr. Matthias Dogbatsey

## Contact Information

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**UA Campus Directory:**

- Mr. Matthias Dogbatsey (<https://www.ua.edu/directory/?i=mdogbatsey#listing>)

## Prerequisites

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**UA Course Catalog Prerequisites:**

C- or higher in MATH 113 and C- or higher in MATH 112; or C- or higher in MATH 115

### I - Algebra

- Factorization
- Simplification of Algebraic Expressions
- Functions
  - Graphs of Basic Functions (lines, parabolas, sine, cosine)
  - Equation of lines (point-slope formula)
  - Finding Intercepts

### II - Trigonometry

- Trigonometric Identities
  - Basic Identities
  - Double-Angle Identities

- Trigonometric Ratios
  - SOH-CAH-TOA
- Simplification of Trigonometric Expressions
- Special Trigonometric Values
  - Unit Circle

## Non-Graded (Required) Diagnostic Test

- A Diagnostic Test will be scheduled in WebAssign to assess your understanding of the prerequisites of the course. The diagnostic test will help you identify the prerequisites that you need help with.
- The diagnostic test is not for a grade. However, completing the diagnostic test is required before you can start working on the course (homework, quizzes and tests).
- No minimum score is required and there is no time limit to complete the diagnostic test.

## Course Description

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### Course Description and Credit Hours

No description found

## Course Structure

The class will include three 50-minute lectures and one 75-minute recitation per week.

## Required Texts

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### Required Texts from UA Supply Store:

- ACCESS GRANTED CODELESS / MATH 125/126/145/146/227/247 AGP (STEWART/WEBASSIGN ACCESS ESSENTIAL CALCULUS) (**Required**)
- CALCULATOR CASIO FX-260 SOLAR II (**Required**)

## WebAssign

All homework, quizzes and tests will be done in WebAssign. An access code is required, which should already be included with your UA billing through the Access Granted Program. The access code allows student access to the publisher's website, where all assignments and tests must be completed. Also, the entire textbook may be viewed online and any part of it may be printed (up to 10 pages at a time).

A hard copy of the textbook may be purchased, but is not required.

**NOTE:** *Students must always access WebAssign by first opening the Blackboard Learn Course Home Page and then clicking the Access WebAssign link.*

## Course Objectives

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## Student Learning Outcomes

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LEARNING OUTCOMES FOR THIS COURSE:

- 1) Students will be able to find limits of functions.
- 2) Students will be able to calculate (and simplify) derivatives involving algebraic operations and function compositions of polynomial, rational, exponential, trigonometric, and inverse trigonometric functions.
- 3) Students will be able to apply derivatives to various applications including optimization problems, linear approximation, related rates, and curve sketching.
- 4) Students will be able to calculate (and simplify) integrals using basic techniques of integration, including substitution.
- 5) Students will be able to use integration to find the area of certain types of planar regions.

## Other Course Materials

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### Calculator:

The only handheld calculator you will be allowed to use on the tests and final exam is the Casio fx-260. Using a different hand-held calculator on tests/final exam is considered academic misconduct. Practice with it! You cannot get calculator help during the exam.

### Disability Statement:

The University of Alabama is committed to ensuring the full participation of all students in its programs. Students who may require special accommodations must register with ODS each semester at [www.odsonlineportal.ua.edu](http://www.odsonlineportal.ua.edu) (<http://www.odsonlineportal.ua.edu/>).

If approved, ODS will generate a Faculty Notification Letter, which you must email to instructors of each of your classes. Your math instructor must receive this letter at least 3 business days prior to a test to ensure

your accommodations are in place for that and subsequent tests.

After you send the Faculty Notification Letter, you should receive an email from your instructor and/or [mtlcods@ua.edu](mailto:mtlcods@ua.edu) with details about providing your accommodations. If ODS recommends extra time for your tests and this creates a conflict with testing at your regularly scheduled test time, you must email [mtlcods@ua.edu](mailto:mtlcods@ua.edu) (<mailto:mtlcods@ua.edu>) at least 3 business days prior to your test to reschedule.

## Outline of Topics

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<i>Topics</i>	<i>Sections</i>
<b>Part 1: LIMIT OF FUNCTIONS</b>	Exam #1 Topics
Topic 1: The Limit of a Function	1.3
Topic 2: Calculating Limits	1.4
Topic 3: Continuity	1.5
Topic 4: Limits Involving Infinity	1.6
Topic 5: Derivatives and Rates of Change	2.1
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<b>Part 2: DERIVATIVE OF FUNCTIONS</b>	Exam #2 Topics
Topic 6: The Derivative as a Function	2.2
Topic 7: Basic Differential Formulas	2.3
Topic 8: The Product and Quotient Rules	2.4
Topic 9: The Chain Rule	2.5
Topic 10: Implicit Differentiation	2.6
Topic 11: Related Rates	2.7
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<b>Part 3: APPLICATIONS OF DERIVATIVES</b>	Exam #3 Topics
Topic 12: Linear Approx and Differentials	2.8
Topic 13: Derivatives of Logs and Exponents	3.3
Topic 14: Inverse Trigonometric Functions	3.5
Topic 15: Maximum and Minimum Values	4.1
Topic 16: The Mean Value Theorem	4.2

Topic 17: Derivatives and The Shapes of Graphs	4.3
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<b>Part 4: OPTIMIZATIONS AND INTEGRALS</b>	Exam #4 Topics
Topic 17: Derivatives and The Shapes of Graphs (Cont.)	4.3
Topic 18: Curve Sketching	4.4
Topic 19: Optimization Problems	4.5
Topic 20: Antiderivatives	4.7
Topic 21: Areas and Distances	5.1
Topic 22: The Definite Integral	5.2
Topic 23: Evaluating Definite Integrals	5.3
Topic 24: The Fundamental Theorem of Calculus	5.4
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<b>Part 5: APPLICATIONS OF INTEGRALS</b>	Final Topics: All Sections
Topic 25: The Substitution Rule	5.5
Topic 26: The Area Between Curves	7.1

## Exams and Assignments

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### Coursework

Coursework can be done on any computer with internet access.

- Log in to [ulearn.blackboard.com](http://ulearn.blackboard.com) using your myBama information, click on your course.
- All assignments and tests will be completed through WebAssign, which is linked in your Blackboard course. Always use the link provided in Blackboard. If you have trouble, make sure you are allowing pop-ups and allowing cookies always. If that doesn't help, try using a different internet browser.

### Homework Assignments

- Homework will be assigned through WebAssign.
- You will be able to submit your answers up to **100 times**. After the homework deadline, you can practice another version of the problems included in the assignment.

- There will be a homework assignment for each topic covered in the course.
- Homework assignments must be completed before the deadline for full credit. See Policy on Missed Exams and Coursework for more details.

## Lab Activities

- There will be Lab Assignments that students need to complete during recitations on every Tuesday.
- The Lab Assignments have IP restrictions so students can only complete them on-time during your scheduled recitations. Students can ask tutors for help while working on Lab Assignments during recitations.

## Quizzes

- There will be online quizzes that students can complete in 10 minutes at the end of each recitation on Tuesday.

## Tests and Comprehensive Final Exam

There will be 4 tests and a comprehensive final exam, all computer-based, on the dates listed below.

- All tests will be given during recitation at the Mathematics Technology Learning Center (MTLC) located in Math and Science Education Building.
- Tests will be taken through WebAssign.
- The number of submissions on test questions depend on the type of question.
  - Computational Questions (algebraic/symbolic): **2 submissions**
  - Multiple-Choice and Multiple-Select Questions: **1 submission, unless otherwise stated**
- You will **ONLY** be allowed to use the **Casio fx-260-SOLAR** or **Casio fx-260 SOLAR II** (available at University bookstores) on tests.
  - There will **NOT** be a computer calculator available during a test.
  - Practice with it! You cannot get calculator help during testing.
  - Using a different hand-held calculator on a test is considered academic misconduct.
- **Extra Credit:** Each regular test and the final exam will have a bonus question.
- Tests Reviews

- The materials from the old lab activity assignments will be used to review for your tests.
- Many extra exercises included at the end of each lab activity are for practice before each test. These extra problems are non-graded, but students should solve them carefully before taking the tests.
- There will be NO early tests.

<b>Test</b>	<b>Date</b>	<b>Time</b>	<b>Time Limit</b>
Test 1	01/31/2023	Recitation time	75 minutes
Test 2	02/21/2023	Recitation time	75 minutes
Test 3	03/21/2023	Recitation time	75 minutes
Test 4	04/18/2023	Recitation time	75 minutes
Final Exam	Check UA Calendar	Chec UA Calendar	120 minutes

## Grading Policy

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**COURSE GRADE:** Grades will be determined from homework assignments, lab assignments, quizzes, 4 tests and a mandatory comprehensive final exam. The course grade will be determined by points earned as follows:

### I - Homework (5%)

- All homework assignments are equally weighted.
- The lowest three homework will be dropped. See Policy on Missed Exams and Coursework for more details.

### II - Lab Assignments (15%)

- All lab assignments are equally weighted
- The lowest two lab assignments will be dropped. See Policy on Missed Exams and Coursework for more details.
- No extension for lab assignments

### III - Quizzes (10%)

- All quizzes are equally weighted

- The lowest two quiz scores will be dropped. See Policy on Missed Exams and Coursework for more details.

## IV - Tests (45%)

- No make-up test will be given for any reason.
- The lowest of the four regular test scores will be dropped. **Only one regular test may be dropped!** See Policy on Missed Exams and Coursework for more details.

## V - Final Exam (25%)

- No make-up final exam will be given for any reason.
- The final exam cannot be dropped. You must take the final exam. See Policy on Missed Exams and Coursework for more details.

## Grade Ranges

Final Grade Range	Letter Grade
[97, 105)	A+
[93, 97)	A
[90, 93)	A-
[87, 90)	B+
[83, 87)	B
[80, 83)	B-
[77, 80)	C+
[73, 77)	C
[70, 73)	C-
[67, 70)	D+
[63, 67)	D
[60, 63)	D-
[0, 60)	F

## Policy on Missed Exams and Coursework

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## Homework

- The lowest 3 homework assignments will be dropped.
- If homework assignments are missed or not completed for any reason, you may request an automatic extension in WebAssign within **7 days** of the deadline and complete the assignment by the new deadline for up to **50%** partial credit. Only the work submitted after the original deadline will get partial credit; all work submitted before the original deadline gets full credit. Any assignments not attempted will be scored 0.
- Even though WebAssign may extend an assignment past the end of the semester, all extended work must be submitted by **11:59 PM on Wednesday, May 3rd**, to count towards your final grade.
- **Do not wait until the last minute to submit your work!**

## Lab Assignments

- No extension for lab assignments in any circumstances.
- The lowest two scores will be dropped.
- Students need to complete lab assignments on-time during your scheduled recitations. If not completed on-time, students can complete at home before the due time.
- Students must complete the lab-activity assignment at least 5% in order to take the Quiz at the end of each recitation.

## Quizzes

- No make-up quiz will be given.
- The lowest two quiz scores will be dropped.

## Tests and Comprehensive Final Exam

- The lowest of your 4 regular test scores will be dropped.
  - Only one test score may be dropped.
  - There are **NO** make-up tests.
- The final exam cannot be dropped nor replaced. Do not miss the final!

If you have special circumstances that cause you to miss more than the allotted drops, you may submit an official explanation and any supporting documents to [mtlc.ua.edu/petition/](https://mtlc.ua.edu/petition/). Do not submit a petition unless drops have been exhausted.

It is important to take every assignment and test seriously and to complete all assigned work on time. Do your best on every assignment!

Students who will miss any assignment deadlines due to official University or military business must submit official documents to [mtlc.ua.edu/petition/](http://mtlc.ua.edu/petition/) at least 3 business days before absence.

## Attendance Policy

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Attending class is an integral part of student learning. Attendance is expected. Exams will be based on problems presented in the lecture and on the homework, so coming to lecture is very important for doing well on the exams.

Each student needs to attend the regular lectures on Monday, Wednesday, Friday, and also attend scheduled recitations on Tuesday to complete the Lab Assignments and Quizzes.

## Notification of Changes

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The instructor will make every effort to follow the guidelines of this syllabus as listed; however, the instructor reserves the right to amend this document as the need arises. In such instances, the instructor will notify students in class and/or via email and will endeavor to provide reasonable time for students to adjust to any changes.

## Department of Mathematics Academic Misconduct Policy

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1. During tests you may only use a calculator that has been specifically approved by the instructor. Using or being in possession of an unauthorized calculator will be considered academic misconduct.
2. Taking a test for another student will be treated as academic misconduct by both parties. In particular, showing an instructor a fake ID or another student's ACT card will be treated as academic misconduct.
3. Receiving or providing assistance of any kind during an exam will be treated as academic misconduct by both parties.
4. Cellphones must be turned completely off and placed with other belongings on the floor. All watches must be taken off and put away. DO NOT put your phone or watch in your lap or on your chair or desk. Physically holding or concealing on your person a phone, watch or other unauthorized technological device (including but not limited to headsets, earphones, earbuds, microphones, cameras, or scanning pens) will be treated as academic misconduct.
5. If you are seen using an unauthorized device, the instructor may request that you turn it over. It will be returned at the end of the exam. However, the instructor does not have to request your device in order to charge you with academic misconduct.
6. If for any reason you must have access to your phone while taking a test, you must inform an instructor prior to accessing your phone. The instructor must be present while you use the phone. Failure to do so will be treated as academic misconduct.
7. If necessary, scratch paper will be provided. No other paper is allowed; being in possession of any unauthorized papers will be treated as academic misconduct.
8. You may review your test before leaving the exam. You may not photograph your exam or write down or copy any information pertaining to the test, nor may you share any information about the test with anyone by any means. This includes sharing information by word of mouth, written correspondence,

electronic device or any type of social media. Providing information about the test to other students will be treated as academic misconduct. Also, having in your possession information about any test prior to the test that was not given to you by the instructor will be treated as academic misconduct.

9. You may not leave your place during a test for any reason. This includes getting water or going to the restroom. You must take care of these things before the start of the test. If you leave your test without permission, your test will be collected and you will not be allowed to continue working on it.
10. Interrupting the exam or creating a disturbance to cause a distraction during the exam will be treated as academic misconduct.
11. In order to enforce these rules, an instructor may require you to do any of the following. Failure to comply will be treated as academic misconduct.
  - a. Remove hats, hoods, scarves, or other head coverings.
  - b. Remove bulky coats, sweaters or other over-garments.
  - c. Roll up sleeves.
  - d. Remove anything seen in your ears or on your person.
  - e. Empty your pockets and display the contents.
  - f. Sit in assigned seats prior to the start of the exam.
  - g. Require you to move to a new seat during the exam.

If you wear a hat, head covering or long-sleeved garment for religious reasons, the instructor may still request to examine under them. If you would prefer to have this done privately, or by an instructor or staff member of the same sex, you will be accommodated. To ensure accommodation, you must discuss this with your instructor prior to the test.

If you use a hearing aid or other adaptive technology that could be mistaken for an earbud or other unauthorized electronic device, please notify your instructor prior to the test. You may be asked to provide documentation of your need to use such a device.

### **MTLC Specific Policies**

1. In the MTLC, you may only use either the **Casio fx-SOLAR SCHOOL** or the **Casio fx-260 SOLAR II**.
2. In the MTLC, swiping another student's ACT card will be treated as academic misconduct.
3. In the MTLC having any other website other than the test open during a test will be treated as academic misconduct.
4. In the MTLC, if you leave your computer during a test without permission, your exam will be closed and you will forfeit any remaining exam time.

## **Statement on Academic Misconduct**

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Students are expected to be familiar with and adhere to the official Academic Misconduct Policy (<https://catalog.ua.edu/undergraduate/about/academic-regulations/student-expectations/academic-misconduct-policy/>) provided in the Online Catalog.

## **Statement On Disability Accommodations**

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Contact the Office of Disability Services (ODS) (<https://catalog.ua.edu/undergraduate/about/support-programs/disability-services/>) as detailed in the Online Catalog.

## Severe Weather Protocol

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Please see the latest Severe Weather Guidelines (<https://ready.ua.edu/severe-weather-guidelines/>) in the Online Catalog.

## Pregnant Student Accommodations

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Title IX protects against discrimination related to pregnancy or parental status. If you are pregnant and will need accommodations for this class, please review the University's FAQs on the UAct website (<https://www.ua.edu/campuslife/uact/information/pregnancy>) .

## Religious Observances

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Under the Guidelines for Religious Holiday Observances, students should notify the instructor in writing or via email during the first two weeks of the semester of their intention to be absent from class for religious observance. The instructor will work to provide reasonable opportunity to complete academic responsibilities as long as that does not interfere with the academic integrity of the course. See full guidelines at Religious Holiday Observances Guidelines (<https://provost.ua.edu/oaa-guidelines-for-religious-holidays-observance>) .

## UAct Statement

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The University of Alabama is committed to an ethical, inclusive community defined by respect and civility. The UAct website ([www.ua.edu/uact](http://www.ua.edu/uact) (<https://www.ua.edu/uact>) ) provides extensive information on how to report or obtain assistance with a variety of issues, including issues related to dating violence, domestic violence, stalking, sexual assault, sexual violence or other Title IX violations, illegal discrimination, harassment, hate or bias incidents, child abuse or neglect, hazing, threat assessment, retaliation, and ethical violations or fraud.

## Wellness Resources

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### College can be a stressful time

If you or someone you know is facing a challenging time or dealing with academic or personal stress, anxiety, depression, or other concerns, we strongly encourage and support you to seek assistance or to help friends find the care that they may need. Please refer to our Campus Resource List for Students (<https://alabama.box.com/s/nz3gs827kx538255typ9hm5owd7x0yj8>) .

Also, If you are experiencing a personal crisis and need urgent assistance, you can also contact the following resources:

*Counseling Center*