

MATH 131: Calculus I

04 — Fall 2024

Instructor Information

Name: Dylan Green

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Office Hours: MF 2 – 3pm, T 11am – 12pm, or by appointment

Time: 8:30 - 9:45am

Classroom: MC 106

Course Description

Per the course catalogue: The real number system, functions and graphs, continuity, derivatives and their applications, antiderivatives, definite integrals, and the fundamental theorem of calculus.

Learning Objectives

By the end of this course, you should be able to:

- Recall the definitions of functions, limits, continuity, derivatives, and the common rules for calculating limits and for differentiating functions.
- Calculate limits of various functions using both equation and graphical representations.
- Understand and implement limit rules to calculate limits of various functions.
- Recall, understand, and apply theorems related to continuity, limits, and derivatives.
- Create functions that satisfy certain continuity, differentiability, and limit conditions.
- Prove differentiation rules using the limit definition of the derivative.
- Compute the derivatives of elementary functions using both the limit definition of the derivative and various differentiation rules.
- Evaluate critical points and inflection points of functions to identify local and global maximums and minimums as well as where a function is concave up and concave down.
- Apply differential calculus to solve related rates and optimization problems.
- Utilize L'Hôpital's Rule to calculate limits of certain indeterminate forms.
- Understand how differential calculus is implemented in a variety of disciplines, including geometry, economics, and physics.
- Effectively communicate mathematical notions and ideas using a blend of English prose and mathematical notation.

Textbook, Calculators, & Software

Textbook: *Calculus* (1st Edition), by Laura Taalman and Peter Kohn.

Note: The hardcover copy of the textbook from the bookstore comes bundled with one semester of Achieve (online homework platform) access. If you buy the book elsewhere, it probably **does not** come with Achieve access, which will need to be purchased individually from the publisher's website (see Moodle for details). This semester students will receive free access to the e-book via the Achieve website. See instructions on Moodle for a link to access the textbook.

Grading

The course grade is determined by the following components:

Attendance/Participation	5%
Online Homework	5%
Written Homework	10%
Quizzes	10%
In-Class Exams (3)	45% (15% each)
Final Exam	25%

Important Dates

Please pay attention to the following important dates this semester:

Tue, Sep 10	Add/Drop Deadline
	Last Day to Declare a Class Pass/Low Pass/Fail
Oct 28 – Nov 1	Advising Week
Tue, Nov 5	Last Day to Withdraw from Fall Semester Courses
Mon, Dec 9	Last Day of Classes
Dec 12 – 18	Final Exams

Expectations

Expect to spend around 8 – 12 hours per week outside of class on reviewing lecture notes, homework, and studying. You are expected to actively engage in lecture by asking questions, taking notes, and responding to questions posed by the instructor and your fellow classmates. If something seems confusing, odds are you aren't the only one thinking so, so please ask about it! If you feel yourself falling behind, please come to office hours and take advantage of the tutoring services available to you.

Office Hours

Office hours, which are held Monday and Friday 2 – 3pm and Tuesday 11am – 12pm in MECC 269, are a great opportunity to come with questions about lecture and homework material. If you are unable to attend the regularly scheduled office hours and would like to meet, please reach out to me in advance and we can schedule an appointment.

Homework

Homework in this course will come in two flavors: Online homework and written homework. Online homework will be assigned every Friday and due the following Thursday at 11:59pm. These assignments are meant to be short refreshers for you to practice the material covered in lecture. You will have unlimited attempts at completing the problems in online homework. No late work will be accepted for online homework.

Written homework will be assigned every Wednesday and will be due at the beginning of class the following Wednesday. These assignments are longer and designed to reinforce your understanding of the material covered in lecture. Please start these assignments early and come to office hours if you have questions. Late work will be accepted for *half* credit for two days until the following Friday at the beginning of class, after which time no late work will be accepted.

You are encouraged to form study groups and visit office hours or the Tutoring Center for help with homework problems, but you must write your solutions independently. For written homework sets, you will be asked to indicate who (if anyone) you collaborated with.

Quizzes

During weeks without an exam, a short 10-15 minute quiz will be administered during class on Wednesday. These quizzes will cover material from the previous week and will be of a similar level of difficulty as the online homework. No makeup quizzes will be given.

Exams

There are three in-class exams as indicated on the schedule below as well as one cumulative final exam. **Do not make arrangements to leave for break before the final exam date.**

Final Exam: Thursday December 12, 12pm – 2:30pm

Students with Accommodations

Trinity College is committed to creating an inclusive and accessible learning environment consistent with the Americans with Disabilities Act. Students with disabilities who may need some accommodation in order to fully participate in this class are urged to contact the Student Accessibility Resource Center, as soon as possible, to explore what arrangements need to be made to assure access.

If you have approval for academic accommodations, please notify me by the end of week two of classes. For those students with accommodations approved after the start of the semester, a minimum of 10 days' notice is required. Please be sure to meet with me privately to discuss implementation.

Student Accessibility Resources can be reached by emailing SARC@trincoll.edu

Academic Integrity

In accordance with the Trinity College Student Integrity Contract, students are expected to abide by the highest standards of intellectual honesty in all academic exercises. Intellectual honesty assumes that student do their own work and that they credit properly those upon whose work and thought they draw. It is the responsibility of each student to make sure that they are fully aware of what constitutes intellectually honest work in every exam, quiz, homework, or other academic exercise submitted for evaluation in a course at Trinity College.

Use of Generative AI Tools

As machine learning continues to advance, the use of generate AI tools, such as ChatGPT, is becoming more widespread. These models can at times be useful tools to accelerate productivity and understanding. The use of such AI tools **is permitted** for homework in our course (though **not** quizzes or exams), so long as the following guidelines are adhered to:

1. When using a generative AI tool to aid in completion of an assignment, all prompts and output should be saved and submitted as part of the assignment. This may be in the form of a screenshot, copy and paste, PDF, etc.
2. The work that you submit should reflect your own understanding of the assignment.
3. Copying the output from an AI tool and handing it in as your own work is not permitted, similarly to how copying a peer's work and submitting it as your own is not allowed.
4. For some homework problems, it may *not* be allowed to use an AI tool. Such problems will be clearly indicated. If it is not indicated that a problem is to be done without the use of generative AI tools, then you *are* permitted to use them.

Some examples of times where it may be useful to use an AI tool in your work are:

- You forgot an idea or concept from a previous class that is needed for the current problem you are working on.
- A certain concept or idea is confusing, and you want to help better your understanding of it.

It is worth noting that, in some cases, AI tools may give an answer to a prompt that is completely (and sometimes wildly) incorrect. As such, always be skeptical of any generative AI output you see and verify the veracity of the information contained within. If you have any questions about the use of these tools in the class, please reach out to the instructor.

Course Webpage

At the webpage <https://calculus.domains.trincoll.edu> you will find information about the Math Tutoring Center, Calculus workshops, as well as links to helpful desmos graphs and other supplemental materials.

Calculus Workshops

The calculus workshop is an optional 0.25 credit (pass/fail) class, which meets once a week for 75 minutes on Thursday in MECC 172. Each week, you will work in small groups with students from various sections of Math 131 on worksheets of supplemental problems designed to reinforce and expand your understanding of the material.

There are two sections. You can enroll as if it were any other class:

Math 131-20	Thursday 10:50am-12:05pm	MECC 172
Math 131-21	Thursday 9:25am-10:40am	MECC 172
Math 131-22	Tuesday 10:50am-12:05pm	MECC 172
Math 131-23	Tuesday 9:25am-10:40am	MECC 172

Tutoring

Drop-in tutoring is available in the Math Tutoring Center (Q-Center), located in MECC 172, Monday through Thursday 4-10pm and Sunday 7-10pm. The schedule and instructions to access tutoring will be made available in the second week of classes and linked from Moodle as well as at the webpage <https://www.trincoll.edu/quantitative-center/tutoring-support/>

Class Attendance and Participation

Attendance of all lectures is required. Attendance may be taken at the beginning of each lecture, and attendance be counted toward the Attendance/Participation grade at the end of the semester.

Under normal circumstances, missed homework, quizzes or exams cannot be made up and will receive a grade of zero. In the event of an unforeseen unavoidable circumstance which prevents you from attending class on the day of a quiz or homework due date, a suitable make-up assignment, or excusal from the assignment will be granted on a case-by-case basis, provided written documentation of illness or emergency, or a note from the Dean of Students office.

It is your responsibility to find out what was covered in any lecture that you miss and to arrange for the submission of any assignments before the due date.

Course Policies

- **Low Exam Policy:** If your grade on the final exam is better than the grade on your lowest midterm exam, your final exam grade will replace your lowest exam grade. Note: you must take all three midterm exams.
- **Low Quiz Policy:** Your lowest quiz grade will not count towards your final grade.
- **Calculator Policy:** The use of a graphing calculator on quizzes and exams is prohibited. You may use any calculator during class, but not any other electronic devices, except for note taking (this includes cell phones, laptops, and MP3 players).
- **Use of Moodle:** I will use Moodle to post links to supplemental and review material, copies

of homework assignments, solutions, handouts, etc. Please make sure you are able to access the Moodle site and bookmark it.

- **Use of Email:** I will use trincoll email to make mass announcements. Please make sure that your Trinity email account is working and check regularly for announcements.

Tentative Schedule

Week Number	Monday of Week	Textbook Sections
1	Sep 2	0.1, 0.2
2	Sep 9	1.1, 1.4
3	Sep 16	1.5, 1.6
4	Sep 23	2.1, 2.2
5	Sep 30	Exam 1 , 2.3
6	Oct 7	2.3, 2.4
7	Oct 14	3.5, 2.6
8	Oct 21	2.5
9	Oct 28	Exam 2 , 3.1
10	Nov 4	3.1, 3.2
11	Nov 11	3.3, 3.4
12	Nov 18	Exam 3 , 3.4
12*	Nov 25	3.4
13	Dec 2	3.5, 3.6
13*	Dec 9	Review

The contents of this syllabus may change at the discretion of the instructor. Any such changes will be communicated to the class.