MATH 111: CALCULUS
COURSE INFORMATION

FALL 2022

Location:	Library 204, MWF 9:00–9:50
Instructor:	David Perkinson (he/his) (davidp@reed.edu)
Course homepage:	https://people.reed.edu/~davidp/111/
Moodle:	https://moodle.reed.edu/course/view.php?id=4350
Text:	Openstax Calculus Volume 1
Office hours:	11–12 M, 3–4 TuTh, by appointment, or by drop-in

Course description. This is a first course in one-variable calculus: limits, continuity, differentiation, the mean value theorem, Riemann sums, integration, and the fundamental theorem of calculus.

Learning outcomes. After taking this course, students will be able to

» Understand the meaning of differentiation and integration of one-variable functions.
» Compute the derivatives and integrals of standard functions.
» Understand ε- δ proofs.
» Use derivatives to determine properties of functions including minima, maxima, inflections, rate of change, and concavity.
» Use derivatives to solve optimization and related rates problems.
» Use integrals to compute areas.
» Understand the proof of the fundamental theorem of calculus.

Distribution requirements. This course can be used towards your Group III, "Natural, Mathematical, and Psychological Science," requirement. It accomplishes the following goals for the group:

» Use and evaluate quantitative data or modeling, or use logical/mathematical reasoning to evaluate, test, or prove statements.
» Given a problem or question, formulate a hypothesis or conjecture, and design an experiment, collect data or use mathematical reasoning to test or validate it.

This course **does not** satisfy the "primary data collection and analysis" requirement.

Class attendance and participation. This is an in-person class. Therefore, when your health allows, you are expected to be present and engaged. At the same time, each community member has an individual responsibility to help prevent the spread of the coronavirus and other diseases. If you need to miss a class, or series of classes, due to illness, self-isolation, and/or quarantine, you are responsible for emailing me to let me know as soon as possible.

While in class, I expect you to actively engage in conversations by asking questions and participate in classroom discussions and activities. You are expected to do the assigned reading in advance of class, and doing so will help you to participate more effectively.

People have a tendency in math classes to think that their question is trivial or uninteresting. However, in fact, if you are confused about something—even if it feels like something that should be simple—count on at least half of your fellow students being confused on the same point. Asking that question is likely to come as a relief to several of your classmates. Your questions will then encourage others to participate and, thus, help me adjust the pace of the class.

Text. The primary source of information for our course will be my lectures. I will provide typed versions of these shortly after each class. I will also roughly follow the textbook Openstax Calculus Volume 1, which is freely available online. Please supplement my lecture notes with relevant examples and explanations in the text. The text may also help to recall ideas from precalculus and trigonometry. Youtube videos and anything else online that will help to understand my lectures are also encouraged.

Homework. Homework assignments will be posted on our course homepage and will be due via Gradescope.[1] Excellent solutions take many forms, but they all have the following characteristics:

» computations are displayed neatly and included relevant steps—not just the answer; they *do not include scratch work*;

» when written explanations are required (as opposed to straightforward computations), they should be in *complete sentences*;

» they are written as explanations for other students in the course; they do not assume that the reader will fill in details;

» when graphical reasoning is called for, they include large, carefully drawn and labeled diagrams;

I reserve the right to not accept late homework. If health or family matters might impede the timely completion of your homework, please contact me as early as possible.

Feedback. You will receive timely feedback on your homework via Gradescope. Most homework problems will be graded on a five-point scale ($5 =$ perfect; $4 =$ minor mistake; $3 =$ major mistake, right idea; $2 =$ significant idea; $1 =$ attempted, $0 =$ none of the above). *The quality of your writing will be taken into account.* If your answer is incorrect, this will be reflected in the score, and there will also be a comment indicating where things went wrong with your solution. You are strongly encouraged to engage with this comment, understand your error, and try to come up with a correct solution.

Collaboration. You are permitted and encouraged to work with your peers on homework problems. It is best practice to cite those with whom you worked, and you must write up solutions independently. **Duplicated solutions will not be accepted and constitute a violation of the Honor Principle.**

[1] Gradescope is an online homework submission and evaluation platform. You are likely to already be enrolled in our Gradescope class. If not, you will be able to enroll using a link+code provided on our Moodle page.

Grades: Your grade will be based on the quality of your homework, a midterm, a final exam, and class participation. Homework will be a significant part of the grade—missing a single assignment will have a noticeable effect.

Academic honesty: As noted above, for homework you should write your own solutions and disclose your collaborators. The internet is a great source of information about mathematics; you are welcome to search for information about the material of the course online, but you should not search for solutions to specific problems in the homework. You should not consult solutions to homework from previous versions of this class. **Copying solutions from fellows students or from the Internet is an Honor Principle violation and will result in an academic misconduct report.**

Joint expectations. As members of a communal learning environment, we should all expect consideration, fairness, patience, and curiosity from each other. Our aim is to all learn more through cooperation and genuine listening and sharing, not to compete or show off. I expect diligence and academic and intellectual honesty from each of you. You should expect that I will do my best to focus the course on interesting, pertinent topics, and that I will provide feedback and guidance which will help you excel as a student.

Help. There are a number of resources you can access for help with this course's content. Everyone is welcome and encouraged to attend my **office hours**. They are an opportunity to clarify difficult material and also delve deeper into topics that interest you. We will have weekly or biweekly evening **group sessions**. These are opportunities to work with fellow students on the homework. There are SuMTuWTh evening **drop-in tutoring sessions**. Details for the group and drop-in sessions will be posted on our class homepage. Further, every Reed student is entitled to one hour of free **individual tutoring** per week. Use the tutoring app in IRIS to arrange to work with a student tutor.

Technology: The use of electronic devices (computers, cell phones, tablets, etc.) is not allowed in the classroom without my authorization. Browsing the internet, answering your email, and texting during class is rude—it disrupts learning. It distracts your classmates and your instructor. Talk to me if you have a specific reason for needing to use technology (for example, note-taking).

Academic accommodations. If you have a documented disability requiring academic accommodation, please have Disability & Accessibility Resources (DAR) provide a letter during the first week of classes. We can then discuss your accommodations. I cannot provide accommodations after an assignment has been turned in or within 24 hours of an exam. If you believe you have an undocumented disability and that accommodations would ensure equal access to your Reed education, I would be happy to help you contact DAR.

A final remark: Learning and understanding mathematics requires engaging with the material several times. You might not get what is happening on the first try. Struggling with the material is normal and, maybe, even expected. By actively participating in class, spending time working on the homework, reviewing the material, talking to classmates and talking to me, you will increase your understanding. Use the resources available!