

Calculus for Physical Scientists II (Math 161)

Fall 2018

Technicalities

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Course web page: <https://www.math.colostate.edu/~clayton/teaching/m161f18>

Text: Officially *Thomas' Calculus*, Fourteenth Edition, by Hass, Heil and Weir, but any reasonably recent edition of the text will have substantially the same information, and should be adequate for the course. Additionally, reading assignments will also link to high-quality, freely-available alternatives from APEX Calculus and OpenStax.

Time/Location: 9:00–9:50 MTWF, Weber 202.

Office Hours: Monday 10:00–11:00, Wednesday 1:00–2:00 in TILT Great Hall, and by appointment.

Calculators: No calculators are allowed on any quizzes or exams.

Prerequisites: Calculus I (MATH 159 or 160)

Summary of the Course

This course builds on some of the key ideas from Calculus I, especially in developing the theory of integrals and how to compute them, but also charts new territory in the form of one of the most important and fundamental tools in applications of mathematics to the physical sciences: power series. We start with an introduction to sequences and series, digress into the study of transcendental functions and techniques of integration, then return to series and especially power series. Finally, we will extend the domain of discourse from the real line to the plane, introducing calculus on parametrized curves and in polar coordinates.

You should understand each of these concepts theoretically, geometrically, and heuristically and be able to compute effectively enough to apply them appropriately. In order to do so you will need to develop your abilities to think mathematically and communicate effectively.

Assignments

It is impossible to *learn* mathematics without actually *doing* mathematics. The goal of the assignments is to deepen your understanding of the concepts, tools and techniques discussed in class, as well as to give you the opportunity to practice explaining your mathematical thinking. The importance of effective communication is vital: knowledge without the ability to communicate that knowledge is of limited value.

Reading Assignments

You will be assigned to read a section before almost every class. Although it is impossible (at least absent some pretty intrusive surveillance) to check whether you are doing this reading, you will also be expected to *attempt* the corresponding WeBWorK problems (see below) before class. This attempt is graded in a binary way: did you make an honest attempt to solve the problems, or not?

WeBWorK

We will use the electronic system WeBWorK for homework assignments.

Log in at <https://courses1.webwork.maa.org/webwork2/colostate-math161/> with your eID or eName; this is the same as your login for Canvas. Initially, your password is your CSU ID number (a 9 digit number); please change your password when you log in for the first time.

There will be WeBWorK assignments for each course topic. As mentioned in the previous section, you should make an honest attempt to do these problems *before* the class covering the material. You will of course have the opportunity to revisit these problems after class, but the more you do before class, the less you have to revisit.

Extensions will rarely if ever be granted.

Quizzes

There will be quizzes on a roughly weekly basis, usually on Fridays. Quizzes will last approximately 15 minutes and may be unannounced. The two lowest quiz grades will be dropped.

Exams

There are three midterm exams and a final. The midterms are on **September 13**, **October 11**, and **November 8**, each from 5:00–6:50PM (note that these are Thursday evenings!), and the final is **December 12**, from 11:50AM–1:50PM. There is absolutely no leeway in this exam schedule, so please make note of these dates.

You may not use any electronic aids (calculators, phones, etc.) or books on the exams. One handwritten sheet of notes is fine.

Labs

These are longer assignments which will be turned in occasionally over the course of the semester.

Attendance

You are expected to attend class every day, to participate in class, to read the textbook, and to do the homework.

Grading

Your final grade in the course will be determined by:

Quizzes and WeBWorK: 20%

Midterms: 15% each

Final Exam: 25%

Labs: 10%

Here's how the grading process works. First, I compute an overall course grade for you on a scale of 0–100 by combining your various scores using the weights above. Then, I rank everybody in the class in order by their score and assign cutoffs for 'A', 'B', 'C', and 'D'. Generally these are somewhat lower than the traditional 90, 80, 70, and 60. When setting the cutoff I consider the

students immediately above and below the line and try to take into account improvement and other circumstances. That being said, the list is never, ever reordered. Regardless of other circumstances, a better score in the class should always earn at least as good a letter grade. Ultimately, I can only grade the course based on what you have actually done.

Policies

The Department of Mathematics has a set of policies which cover topics ranging from cell phones to alternate exams. These are available at

<http://www.math.colostate.edu/programs/undergraduate/policies.shtml>

and it is your responsibility to read them.

Some particular issues of interest:

Academic Honesty

Colorado State University has an Academic Integrity Policy and Student Conduct Code; you can read about this policy at <http://policylibrary.colostate.edu/policy.aspx?id=442>, and find related materials at <https://tilt.colostate.edu/integrity/>. This will be enforced in Math 161. Briefly, while you are encouraged to seek out help, including from your peers, for labs and homework assignments, all work on any quiz or exam must be your own.

Students judged to have engaged in cheating on a particular quiz or exam will receive a score of 0 for that particular quiz or exam. Also, for the student who received a 0 on a quiz or exam due to cheating, Repeat/Delete will not be an option for the grade earned the semester cheating occurred. A second offense will result in an F for the course. Cases of flagrant academic dishonesty will be brought to the attention of the TILT Academic Integrity Program.

RDS

Colorado State University is committed to providing reasonable accommodations for all individuals with disabilities; Resources for Disabled Students (<http://rds.colostate.edu>) coordinates the necessary support systems.

If you need accommodation, especially for exams, it is up to you to work with RDS to make suitable arrangements; the sooner you do this, the better. In particular, you can schedule an exam with them at <http://rds.colostate.edu/schedule-an-exam>

Make-Up Quizzes and Exams

Make-ups for quizzes and exams will be given only in the cases of university-approved absence and documentable emergencies. All excuses must include adequate documentation. Please inform me about any such absences as soon as possible.

Exam Conflicts with Other Courses

The math department will not give you an override to register for Math 161 if you have a conflict with another course at the times of the Thursday evening exams. If another department gives you

an override which results in such a conflict, it is up to *that* department to resolve this conflict. In particular, there will be no alternate exam times available to accommodate such conflicts.

There should also not be a direct conflict for the final exam. In the case that a student has three or more final exams in one day, the Registrar indicates that the student may negotiate with his or her instructors for an alternate exam time for one or more courses. In this situation, the general policy is that final exams for uncoordinated courses should be moved instead of those for coordinated courses. In other words, if you are in this situation, please try to move your other final exams since Math 161 is a coordinated course.

Additional help

If I were a perfect teacher, you could learn everything you need to know just by going to class and doing the assignments. Unfortunately, I am not a perfect teacher, so there's a good chance that, at some point, you'll find yourself confused, stuck or otherwise frustrated by the material or the course. If you do, ask for help! Come to office hours, send me email, ask me questions after class.

Also, your fellow classmates are a great resource! Odds are that, for any question you have, there's someone in the class who can answer it, so don't be afraid to ask. Even the simple process of explaining why you're stuck to someone who is just as confused as you is often enough to make things clearer. Just be sure to return the favor when you get the chance to help someone else.

There are two additional campus resources which can be very helpful:

subsection*Calculus Center

The Calculus Center is in The Institute for Learning and Teaching (TILT) Great Hall. During the semester, it is open 9:00–4:00 Monday through Thursday and 9:00–2:00 on Friday. You can show up any time to get help with this course. I have regularly scheduled office hours there on Monday at 10:00 and Wednesday at 1:00, but you can get help from anybody working in the Calculus Center.

Tutoring

Free tutoring is also available at TILT. You can read about this program at

<https://tilt.colostate.edu/learning/tutoring/>

Tutoring is available Sunday–Thursday, 5:00–10:00PM.

Copyright

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Disclaimer

The course syllabus is a general plan for the course; deviations announced in class may be necessary.