

MATH 241: Calculus IV

Instructor. Andrew Cooper, ancoop@math.upenn.edu

Time and Place. TR 10.30am-11.50am, David Rittenhouse Lab

Office Hours. 3N4-A DRL, MW 2pm-3pm, and by appointment

TA.

Website. <http://www.math.upenn.edu/~ancoop/241/>

Text. Haberman, *Applied Differential Equations*, 4th edition.

Scope. We will discuss several partial differential equations derived from physical systems: the heat equation, Laplace's equation, and the wave equation. We will discover techniques to solve these equations, and along the way we will learn a lot about how the elementary functions

Prerequisites. We will use several key ideas from multivariable calculus (Penn's MATH 114), some ideas from ordinary differential equations (Penn's MATH 240), and of course you must be completely fluent with calculus of a single variable, including "tricky" integrals. I will do my best to point out exactly when I am invoking these other courses, but I will not be able to thoroughly review them, so you may need to go back and consult your notes or a textbook.

Homework. Each week I will post a homework assignment to the course website. Each homework assignment has three parts:

- **Reading** Read the indicated information *before class*.
- **Exercises** Exercises are for your practice. Do not turn them in.
- **Problems** Problems are what determine your homework grade. Please write your solutions clearly, on one side of a standard 8.5-by-11 or A4 sheet.

Exercises and problems will be taken from the "core problems", similar problems from the text, and problems from old final exams. The list of core problems and the old final exams can be accessed at <http://www.math.upenn.edu/ugrad/calc/m241/>.

Evaluation. Your grade will be determined solely on the basis of the following graded work:

- **Homework** The Problems (homework to be turned in) will be due at the beginning of class each Thursday, and will be handed back during recitation. Each homework assignment will account for approximately 1% of your grade, for a total of 14%.
- **Exams** There will be three mid-term exams. Each exam will be worth 15% of your grade. Exams will be administered in DRL from 6pm to 7.30pm. Exam dates are . You may use a one-sided 8.5-by-11-inch sheet of handwritten notes for each mid-term exam.
- **Final Exam** There will be a cumulative final exam worth 40% of your grade. Topics covered between the third exam and the final exam may receive more weight on the final exam. This exam will be in common with the other sections of MATH 241. You may use a two-sided 8.5-by-11-inch sheet of handwritten notes for the final exam.

I will use the common final exam to calibrate the scores on these assignments as follows. The MATH 241 professors will collectively set what counts for each letter grade on the final exam. Some number of my students will receive an A on the final exam. That will be the number of As I give out for the course, based solely on rank according to the graded work. Similarly with Bs, Cs, and Ds and below. *Your scores on graded work other than the final exam are not directly comparable to the scores of your comrades in other sections of the course.*

Missed Assignments. If you will miss an exam, please let me know *in writing* and *as soon as possible*. I will be the sole arbiter of what constitutes a valid reason for missing an assignment, and of determining how missed assignments are to be made up. Late homework will not be accepted.

Grading of Exams. Exams will be multiple-choice. The answer choices are provided to let you know if you have made a mistake in arithmetic—if the answer you get is not a choice, you know you will have to check your work. The existence of answer choices does **not** mean your answer is all that matters—indeed most of the points will be given for the work you show. You should approach the exams as you would a short-essay exam: your thoughts must be clearly laid out, easy to follow, and support your answer.

If you believe that there has been an error in grading an exam, you may submit a written request to Dr. Cooper. The entire exam will be regraded, and your total score may go up or down as a result of the regrade. Regrade requests will not be accepted more than one week after the exam was returned to you, nor will they be accepted after the final exam.

Classroom Participation and Etiquette. As stated above, attendance plays no direct role in your grade. However, *if you do not come to class regularly, you will not pass.* I will regularly post PDF files of my notes, but beware: they are merely a backbone for the lecture, and there will be much material that is communicated either in chalk or words.

The purpose of class attendance is to pay attention and learn. For this reason, if you show up with a book, work from another class, a newspaper, or a computer or other electronic distraction, I reserve the right to ask you to leave. There are much more conducive locations for these activities than in a classroom during a lecture. I have been told that the library has many comfortable chairs, couches, and benches.

The lecture hall's capacity may be larger than the enrollment. Please sit near the front.

A classroom is not a theatre. Please feel free to ask questions and correct errors I may have made.

Office Hours. Both of us are also available by appointment. Office hours are not to be used as a general substitute for lecture or recitation attendance; please come with a specific question or questions so that everyone's time is used efficiently.

You may also consider using the office hours of other sections' instructors and TAs—with their permission, of course.

Email. Communicating mathematics via email is extraordinarily time-consuming for two reasons: the obvious typesetting difficulties, and the subtle nature of the questions. Therefore I will not discuss mathematics via email correspondence. In the long run, it is much more efficient to meet face-to-face. I respond to all student emails regarding administrative matters within 24 hours—if I have not responded within that time, please ask again, as your email may have been buried in my inbox.

Help. There are many resources provided by the Department of Mathematics to help you, which can be accessed at <http://www.math.upenn.edu/ugrad/>. Please make use of these resources early and often.

The One Percent. The remaining one percent of your grade will be for completing the following assignment: read this syllabus. If you have any questions, write a note detailing them, sign and date it, and turn it in at the beginning of class on 15 January. If you have no questions, write a note to this effect, sign and date it, and turn it in at the beginning of class on 15 January. If for any reason you submit your note later than the beginning of class on 15 January, you will receive half credit.