MATH 241: Calculus IV

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

Time and Place. TR 10.30am-11.50am, David Rittenhouse Lab A6

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

TA. Tong Li, `litong@math.upenn.edu`, 3N2-B DRL, WR 4.30pm-5.30pm and by appointment

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

Text. Zill and Cullen, *Advanced Engineering Mathematics*, 3rd edition. The exposition will generally follow the text, but may sometimes depart. I encourage you to read the book regularly.

Scope. We will discuss analytical methods for solving partial differential equations, namely: separation of variables, series and transform solution techniques. We will derive and study the heat and wave equations in one dimension and Laplace's equation in two dimensions. We will also study basic facts about the complex plane and the calculus of complex functions. This material is covered roughly in chapters 12-15 and 17-19 of the text.

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.

Homework. Each week there will be a list of homework problems posted to the course website. These 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/`. I encourage you to take a look at the homework problems *before* the class in which the material they concern is covered.

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

- **Weekly Quizzes** Each week in recitation, you will be given a quiz which consists of two questions from that week's homework. You will have five minutes to complete the quiz. Since the quiz problems will come directly from the homework, you should bring your written homework with you every week to recitation. You may use *your own* homework for the quizzes. Mr. Li will collect both the quiz and your homework. The quizzes will count for 14% of your grade, or about 1% each. You may *not* submit written homework in lieu of the quiz. Which problems are selected for the quiz will be at Mr. Li's discretion.
- **Exams** There will be three mid-term exams. Each exam will be worth 15% of your grade. Exams will be administered in DRL A6 from 6pm to 7.30pm. Exam dates are 8 February, 1 March, and 4 April. 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*. If you will miss a quiz, please let Mr. Li know. 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.

Grading of Exams. Your submitted work must be legible and clearly organised. You may lose points if either of these criteria is not met. 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, attendence 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 is larger than the enrollment. Please sit near the front.

Office Hours. My office hours will be MT 2pm-3pm. Mr. Li's office hours will be WR 4.30pm-5.30pm. 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.

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 17 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 17 January.