Math 104: Introduction to Real Analysis

UC Berkeley, Summer 2006, Section 002-201

Instructor: Patrick Barrow

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hours 3:00 - class, Mon - Thurs.

I am generally free during the afternoons and will gladly schedule additional times as needed.

Textbook: Elementary Analysis: The Theory of Calculus, by Kenneth A. Ross

Schedule: Monday - Thursday, 4:10 - 6:00, 75 Evans. We plan to do an hour of formal lecture per day, followed by a ten minute break, with the remainder left for problem solving and open discussion, and possibly more lecture.

The course runs June 26 - August 17, except for July 4, which falls on a Tuesday. We will have three in class **exams**, each for the full 110 minutes, on July 13, August 3, and August 17 (all Thursdays, also they are equally weighted). There are 8 weeks total, and you will have 12 **homeworks** due. The first is due on Thursday, June 29, and each subsequent homework is due Tuesday/ Thursday, promptly at the start of class. There are no homeworks due on exam days. Because of the unique nature of the summer schedule, we have to adopt a strict "no late" policy with everything. If you have conflicts with any of the above dates, you simply cannot take this course.

Grading: To compute your raw grade, I will average your cumulative homework score with your 3 exam scores, so each will count 25%. If your raw grade is greater than or equal to 80% then you are assured an A- or better, 60% a B-, 40% a C-, and 20% a D-. In the end I can revise this curve if the scores are lower than expected; this simply represents a minimum guarantee on my part. After each exam I will give precise statistics, and I generally promise to be fair.

This is a "proof course." That means answers are to be composed as if you are communicating a fully justified solution to a mathematical colleague. Undoubtedly this description is vague at the moment, but a major theme of this course will be learning exactly what it means to communicate rigorous mathematics. As we progress I hope to make this aspect of things as clear as possible. "Is this a proof?" is a great question for you to be asking at this stage.

The above numbers may seem low. This is because we plan to adopt the grading philosophy of heavily penalizing incorrect reasoning. Arguments with logical gaps or false claims get no credit.

That being said, generous partial credit will be awarded for progress towards a full solution. If you have figured some things out, but are stuck at a specific point, then say so in your answer. Think of it as a response to a query. *If you cannot fully respond, then you are also expected to acknowledge that.* Try to prove a specific case, work out an example, or conjecture that a particular theorem may be relevant. Whatever you do, DO NOT write something that is downright false. To know when you have a partial solution, and to identify precisely the parts you are missing, are invaluable mathematical skills. No one will solve every part of every problem.

You are encouraged to work together to solve homework problems. Of course, the actual written solution must be your own composition. The problems will come directly from the textbook. In fact, you may consider the table of contents a conceptual syllabus for the class, with one section roughly corresponding to one lecture. This makes it easier for you, minimizes my errors, and gives us both a common reference. For each exam I will give specific sections for which you will be responsible. When in doubt, you can study the book.

However, I strongly encourage you to seek other analysis texts, or internet sources like Wikipedia or Mathworld (watch for mistakes!), as a study aid/ problem solving tool. You should be able to learn independently from a resource, to an extent. I aim to provide a good mix of examples, both from the book and elsewhere.

Finally, every time I make a mistake, it is actually on purpose, because I am testing you.