Math 3150 Real Analysis, Fall 2013: Syllabus

Instructor: Chris Kottke

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Course website: http://www.northeastern.edu/ckottke/3150/

Office hours: M 1:30-2:50, W 11-12:30

Text: *Elementary Classical Analysis*, by Marsden & Hoffman. 2nd Ed (ISBN 0-7167-2105-8).

Exam dates: Midterm: Monday, Oct. 21, in class. Final: Friday, Dec. 6, 1-3pm.

Final grade: Homework 50%, Midterm 20%, Final 30%.

Description:

Analysis is one of the three pillars of modern mathematics, along with algebra and geometry. Broadly speaking, it is concerned with the study of functions, usually of one or more real or complex variables, and their properties such as continuity, differentiability and integrability. In this course, we will build up the foundational elements of real-variable analysis: the completeness and topology of the real numbers and Euclidean space, continuous functions on this space, and the classical theorems of single variable calculus.

While some of the results will be familiar from your basic calculus courses, our treatment will be entirely rigorous. You will get to see how mathematics is 'done' by mathematicians, and will develop the ability to write rigorous mathematical proofs. The course will be challenging — you will be expected to spend time studying the text and solving difficult homework problems, many of which you will not be able to solve right away. Learning to do modern mathematics is not something which can be done passively, but rather requires active practice, perseverance, and patience.

Course Policies:

- **Grading:** Your final grade will depend on weekly homework assignments and two exams (one midterm and a cumulative final). Your lowest homework score will be dropped. Letter grades will be awarded on a curve based on your total numerical score computed using the percentages above.
- **Homework:** Homework assignments will be collected weekly in class on Wednesdays. You are encouraged to attempt the problems as soon as possible — they are perhaps the most important component of the course. Collaboration on homework assignments is allowed, and indeed encouraged, however *each student must write up their own homework individually.* Please *cite your collaborators and references used* (apart from the textbook) on your homework assignments.
- **Lectures and announcements:** You are responsible for all material covered in lecture and given as assigned reading, as well as any announcements or changes to the syllabus made during lecture. Such announcements, along with the pages of the book corresponding to the day's lecture, will be posted on the website.
- **Missed/Late assignments and exams:** Late assignments and missed exams are not permissible except in cases of emergency. If you know you will have a conflict, please arrange a work around with the instructor as early as possible. Make-up exams will be oral exams and may be more difficult than the original.

  Only two finals at the same time or three in one day is a University recognized legitimate reason to be excused from taking the final at the scheduled time. Students with such a conflict should complete a final exam conflict form, available on the registrar's website.
- **Grade corrections and disputes:** Please check over your exams and assignments when they are returned to you for any grading mistakes (they happen!) and they will be promptly corrected. *Grade corrections will only be made for one week following the return of an assignment.*

  If you have a concern about the course or the instructor that is not or cannot be resolved by speaking with the instructor, please contact Professor David Massey, 529NI, x5527.

Tips for success:

- **Read the relevant material before class.** A reading assignment will be posted on the website corresponding to each lecture, which should be completed *before* coming to class. You don't need to fully understand everything, but you'll find that having some familiarity with the subject before hearing the lecture is extremely helpful. You will absolutely get more out of each class this way.
- **Start homework problems early.** The homework assignments are your chance to practice the material and develop your skills and intuition — to really *learn* the material. Make an attempt at the homework problems as soon as possible after each lecture, then let them roll around in your head for a while if you don't get them right away. Sometimes the best mathematical insights come while you're walking down the street (or in the shower!) after you've put a problem in the back of your mind. If you wait until the last minute to start the homework assignments, you will set yourself up to do poorly.
- **Don't fall behind.** Confusion is a (perhaps 'the') natural state of learning mathematics. However it is important to identify as soon as possible exactly what you are confused about and address it, for instance by discussing it with the instructor or your fellow students. The concepts in a course such as this one build on each other very rapidly, and you want to avoid any weaknesses in the foundation you are building!
- **Come to office hours.** This is an invaluable time to get 'unconfused'. Identify those things you don't understand very well, and ask me about them — professors like to explain things! I'm also happy to discuss mathematics in general or anything else.