Math 225, Spring 2013
Fundamentals of Analysis: an Introduction to Real Analysis

David Constantine
office: Exley Science Center 609
phone: 860-685-2167
email: dconstantine@wesleyan.edu
homepage: dconstantine.web.wesleyan.edu

Office hours: Wed 2-3p, Thurs 3-4p, or by appointment

TA: TBA
office:
email:
Office hours: TBA
Problem session: TBA

Meeting times: MWF 9:00-9:50 am, SCIE 113


Course overview: In this course we give an introduction to the rigorous study of Analysis, i.e. the mathematics that underlies calculus, differential equations, much of geometry and many applications to other fields. We will study the construction and basic properties of the real numbers, do a brief tour of the topology of $\mathbb{R}$, then cover the basic properties of derivatives and the Riemann integral. Some main goals for the course will be the axiomatic construction of the reals, the Fundamental Theorem of Calculus, the Lebesgue Criterion for integrability. As time permits we will talk about spaces of functions, in particular sequences and series of functions.

A main goal of this course will be to improve your proof-reading, -formulating and -writing skills. We will of course be doing $\varepsilon$-$\delta$ proofs, but we will focus on developing good intuition for how to approach these types of problems so that the mechanics of the proof are not opaque. You will be expected to write a significant number of proofs on homework and exams. I will be expected to present well-written proofs in class and give feedback on your proofs. As such, it is essential that you read along in the text, both to learn the material we don’t have time for, and to be exposed to more
examples of proofs.

**Logistics:** We will have weekly problem sets, two midterms and a final.

- Midterm exams: 20% each
- Final exam: 30%
- Problem sets: 30%
- Two ‘proof conferences:’ 1/3 letter grade each

Problem sets should be neat, clear and STAPLED. You are welcome/encouraged to collaborate with others on the problem sets but must turn in an independent write-up of your solutions. Please indicate your collaborators on your write-up. The lowest-scoring problem set will be dropped. They are always due at the start of class. Late homework is not accepted.

**Important dates:**
- Midterm exams: **Wednesday, February 20, time TBA**
- Week of April 8th, take-home exam, details TBA
- Final exam: **Wednesday, May 15, 9am-12pm**

**Students with Disabilities:**

It is the policy of Wesleyan University to provide reasonable accommodations to students with documented disabilities. Students, however, are responsible for registering with Disabilities Services, in addition to making requests known to me in a timely manner. If you require accommodations in this class, please make an appointment with me as soon as possible so that appropriate arrangements can be made. The procedures for registering with Disabilities Services can be found at http://www.wesleyan.edu/studentaffairs/disabilities/index.html.

**Please note:**

I very rarely give an incomplete or any sort of make-up exam, and do so only for very serious circumstances. Under all circumstances, there is a much better chance I can do something for you if you let me know what is going on ahead of time.

Please be familiar with University policy on cheating and plagiarism, or just be very sure not to do either of those. Ask me if you have questions, and note the homework policy above.