

**MT 320/01 Introduction to Analysis**  
**Fall 2007 Syllabus**

**Schedule:** MWF 12 pm, Fulton 310

**Instructor:** Prof. Mark Reeder, office: Carney 322

**email:** reederma@bc.edu

**Office hours:** MWF 3-4 (subject to change or variation, announced in advance).

**Course website:** <http://www2.bc.edu/~reederma/320F07.html>

**Text:** *Understanding Analysis* by Stephen Abbott.

**Homework:** It will be assigned each week, and collected for grading about one week later. HOMEWORK WILL NOT BE ACCEPTED AFTER THE DAY IT IS DUE. Your lowest homework score will be dropped, so you can miss one assignment without harming your grade. HOMEWORK WILL BE TYPED IN L<sup>A</sup>T<sub>E</sub>X (see below).

**Exams:** We will have two in-class exams, and a final exam. Exams must be taken as scheduled, except for documented illness or family emergency. Airplane tickets purchased blithely in advance of knowing the exam dates does not count as an emergency.

If you have special issues regarding exams, I need to hear about them this month, with documentation from the appropriate offices of Boston College.

**In-Class Exam Dates:**

**Friday Oct 12**

**Monday Nov 19**      **THANKSGIVING WEEK!** See “Airplane” above.

**Final Exam:** Thursday Dec 20, 9:00 am.

**Grading:** Homework: 30%, Exams: 20% each, Final: 30%.

After the final exam, these weights are used to combine your homework and exam scores into a number between 0 and 100. The highest score will probably be an A, and similar scores will receive similar grades. This procedure determines the rest of the grades. Individual exam scores are not curved. They just contribute to the final score, which is “curved” as described above.

Course description on reverse.

**Course Description:** This is the most challenging mathematics course for most undergraduate students. It is an introduction to the theory underlying Calculus, which is based on the structure of the Real Numbers and the precise notion of Limit. Some basic questions to be answered are:

- What is the square-root of two, exactly?
- What is a continuous function, exactly?
- Are there more real numbers than rational numbers?

The work in this course involves rational argument (proofs) more than computations or pictures. Precise mathematical understanding and expression is the primary goal. Can you explain  $\sqrt{2}$  to an unwilling skeptic? Why should I believe there is such a number, if you can't write it down? Paper has holes if looked at closely, hence so does every graph drawn on it. What then, is a continuous function? Like your opponents, you must learn to "Be the enemy of everything you read".<sup>1</sup> The ancient Greek mathematicians, living in a democratic and disputatious world, developed the method of axioms and deductions to have tools for rational argument, in the face of a hostile skeptic. For this to work, you have to be very careful about what you say.

Expect to write, rewrite, and rewrite your homework again. Each sentence, down to the punctuation and word order, must be crafted and honed, until your logic and expression of this logic are airtight. You can discuss problems with other students or me, but the final product must be your own expression. To make editing easier, you will type all of your homework in the mathematical typesetting language of  $\text{\TeX}$ , which for two decades has been the industry standard. The version we'll use is called  $\text{\LaTeX}$ . Our textbook, and this syllabus, were written in  $\text{\LaTeX}$ .

**About  $\text{\TeX}$ :** This is free software that allows you to type things like

$$\int_{-\infty}^{\infty} e^{-x^2} dx = \sqrt{\pi}$$

about as fast as you can write it (with some practice). Instructions, examples, etc are on the course webpage. After an initial learning period, using  $\text{\TeX}$  will make it easier to edit, so you can say exactly what you want to say.

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<sup>1</sup>Ibn Al-Haytham, aka Alhazen, lived 965 - 1039, Arabic mathematician and physicist