Analysis II
Math 414, Spring Semester, 2006
12 noon, 219 Taft Hall
Call #16476 (undergrad), #19323 (grad)

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- Text: *Understanding Analysis* by Stephen Abbott, Springer-Verlag

- Description: Calculus "done right" continues. We will start with Chapter 3, and introduce "Topology on $\mathbb{R}$", which is more powerful way to do ϵ–δ proofs. Next, we present continuity and derivatives of functions using the ideas of topology. Some of this is review from Math 313, other parts are new because it will be presented using the ideas of Topology. Chapter 6 considers sequences of functions, not just sequences of points. (So, now a function is a point in the space of functions...) Chapter 7 presents the theory of the Riemann Integral. Math 313 covered the basic ideas of the Riemann Integral; now we start to introduce the ideas of measure theory, sets of measure zero, and ways to extend the Riemannn integration to limits of sequences of functions. Chapter 8 give three further topics which introduce more ideas of analysis.

- Web: http://www.math.uic.edu/math414/ is the course web page and has the homework assignments, problems, and supplemental material for the class.

- Homework: There will be frequent homework assignments.

  You may discuss homework problems with other students, but you must write up your solution independently. All proofs should be written neatly with complete grammatical sentences.

  There are three kinds of problems we will encounter:

  - Problems without a star should be doable if you understand the material – they are a good test of whether you follow the main ideas;
  - Problems with one star "*" are more difficult – they are challenging, and worth putting the effort into.
  - Problems with two stars "**" are most difficult – they require you think hard and maybe have some new insight into the subject, or maybe just get lucky.

- Grades: There will be two Hour Exams and a Final for the class. Course grades will be based on your scores on these exams, your performance on the homework, and participation in class.