Math 501: Real Analysis
Fall 2007

Instructor: Kris Wysocki
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Office Hours: Monday and Wednesday, 2pm-3pm or by appointment.

Location & Time: 113 Sackett, MWF 11:15am - 12:05pm.


Web-site: http://www.math.psu.edu/wysocki/Math501.html

Homework: The homework assignments will be posted regularly on the web page of the course. I will announce in class when a new assignment is posted. Not all problems will be graded, I will randomly choose three questions which will be graded. However, you are expected to turn in solutions to all problems. Late homework will not be accepted.

Exams There will be one midterm exam on Monday, October 22. The date for the final exam will be announced later.

Grading:
- Homework: 30%
- Midterm Exam: 30%
- Final Exam: 40%

Course Description: The aim of this course is to provide a rigorous treatment to measure theory and Lebesgue integration. One of the principal aims of the course is to prepare you for the Qualifying Exam in Analysis.

Course Topics:
- Measures and outer measures; Lebesgue measure.
- Measurable functions and integration; types of convergence: Fatous lemma, monotone and Lebesgue dominated convergence theorems.
- $L^p$ spaces and their completeness.
- Product measures and Fubini's theorem.
- Absolute continuity of measures and the Radon-Nikodym theorem.
- Differentiation of measures.
- Hilbert spaces and basic theory of Banach spaces.