Math 6200 Real Analysis II syllabus

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OBJECTIVES:
Exposure to real analysis is important for those who enter graduate school in mathematics or mathematics education, as well as those who plan to teach mathematics at the secondary level or higher. We’ll also delve into some new topics which illustrate the power and applicability of real analysis. As a result of your successful completion of this course, you should gain the following: a broadened perspective on mathematics as a whole, and the ability to present concise mathematical proofs orally and in writing.

REQUIREMENTS:
In general, you are expected to

• attend class lectures;
• read and study class assignments and solve assigned problems;
• ask questions in class when you are unsure of any concept or unclear on any assigned problem;
• come to my office for additional assistance as necessary;
• take all exams (including the Final) on the day they are scheduled
• come to class prepared (this includes completing homework in a timely manner, and bringing your textbook

1 Textbook
Methods of Real Analysis 2nd edition by Gerald B. Folland.
2 Course content

2.1 Measures

\( \sigma \)-algebras
Measures
Outer measures
Borel Measures on the real line

2.2 Integration

Measurable Functions
Integration of Nonnegative Functions
Modes of Convergence
Product measures.
The \( n \)-dimensional Lebesgue Integral
Integration in polar coordinates

2.3 Signed Measures and Differentiation

Signed measures
The Lebesque-Radon-Nikodym Theorem
Differentiation on Euclidean space
Functions of Bounded variation

2.4 Fourier Series

Definition of Fourier series
Formulation of convergence problems
\((C,1)\) summability of Fourier series
\( L^2[a,b] \) theory of Fourier series
Convergence of Fourier series
Orthonormal expansions in \( L^2[a,b] \)

3 Grading policy

Two take home tests will be given which will count 60 percent towards the Final grade. Homework problems count 20 percent. Final Exam count 20 percent/
90-100 A, 80-89 B, 70-79 C, 60-69 D Below 60 F.

The Grade I indicates that the student has not completed all course requirements because of illness or other uncontrollable circumstances especially which may occur toward the close of the term. Mere failure to makeup work or turn in required work on time does not provide a basis for the grade I.

Please note the following dates and information: Last day to drop the course without a grade: September 6th
Last day to drop with a "W": October 28th.

Reasonable Accommodations for Students with Disabilities: Reasonable Accommodations for Students with Disabilities: Middle Tennessee State University is committed to campus access in accordance with Title II of the Americans with Disabilities Act and Section 504 of the Vocational Rehabilitation Act of 1973. Any student interested in reasonable accommodations can consult the Disability & Access Center (DAC) website www.mtsu.edu/dac and/or contact the DAC for assistance at 615-898-2783 or dacemail@mtsu.edu

Lottery Scholarship Policy: Do you have a lottery scholarship? To retain the Tennessee Education Lottery Scholarship eligibility, you must earn a cumulative TELS GPA of 2.75 after 24 and 48 attempted hours and a cumulative TELS GPA of 3.0 thereafter. A grade of C, D, F, FA, or I in this class may negatively impact TELS eligibility.

If you drop this class, withdraw, or if you stop attending this class you may lose eligibility for your lottery scholarship, and you will not be able to regain eligibility at a later time.

For additional Lottery rules, please refer to your Lottery Statement of Understanding form (http://www.mtsu.edu/financial-aid/forms/LOTFEV.pdf) or contact your MT One Stop Enrollment Counselor (http://www.mtsu.edu/one-stop/counselor.php).

3.1 Examinations

Tentative dates for the two tests are:

- Tuesday, October 15
- Tuesday, November 24

Make-up test will be given only for documented reasons of illness, family emergency or participation in a University sponsored event. Excuses such
as oversleeping and lack of studying are explicitly noted as unacceptable grounds for a make-up test. A comprehensive Final Examination will be from 3.30pm-5.30pm on Thursday, December 10, 2015.

3.2 Homework
Problems will be assigned for each section. All problems assigned on or before Tuesday’s class will be due on the Next Tuesday.

3.3 Attendance
Attendance at every class meeting is important and expected.

3.4 Judicial Statement/Academic Misconduct

3.5 Academic Honesty
Cheating and plagiarism will not be allowed. You may discuss homework problems with others, but do not copy work from another student or from a book. Violations of this policy will be dealt with according to University guidelines.