Analysis II   Instructor: Russell Brown
MWF 9-9:50pm   Office: POT741
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Fall 2011   rbrown@uky.edu
                                                  Office hours: MWF 10-11
                                                     and by appointment.

Text: *Real analysis: Measure theory, integration and Hilbert spaces,* E.M. Stein
and R. Schakarchi

This course is a continuation of MA 677 and will study questions related to analysis
in $\mathbf{R}^n$. The first part of the course will introduce the theory of Hilbert spaces and
consider several examples of Hilbert spaces that are useful in analysis. The material
in the text will be augmented with some basic facts about Banach spaces so that
students will be familiar with the L^p-spaces for all p.

We will then revisit measure theory and develop the subject in more generality than
we did in the first semester.

I expect that we will cover most of the material of Chapters 4 to 6. Additional
topics may be covered if time permits.

Homework: Homework will assigned and collected regularly. No late homework
will be accepted.

Students will be asked to prepare one of the longer homework problems from Stein
and Shakarchi and present the solution to the class. Students should begin looking
for topics after the mid-term exam.

Grading: Your grade will be determined as follows.

Homework	200
Presentation	50
Exam	100
Final	150
Total	500

Collaboration: You are encouraged to work together and use other resources for
homework. However, the homework you turn in for grading must be your own work.
Thus, after working through the problem in a group, you should write up your
solutions individually.

The mid-term and final exams should be worked alone and using only Stein and
Shakarchi as a reference.

Exams: There will be one take-home mid-term exam and a take home final. I
expect the first exam will be due on approximately 7 October.

The final will be due at 12 noon on Wednesday, 14 December 2011.

Supplemental references: Several books which cover the material of this course
include:

- *Lebesgue integration on Euclidean spaces,* BF Jones.

- *Real Analysis*, H. Royden

- *Real and Complex Analysis*, W. Rudin.

- *Inequalities,* Hardy, Littlewood and Polya.

- *Measure and integral,* Wheeden and Zygmund.

- *Analysis*, E. Lieb and M. Loss.

- *A concise introduction to the theory of integration* Daniel Stroock.

August 22, 2011