

MATH. 6483, FUNCTIONAL ANALYSIS, SPRING 2008,  
TTH 9:00-10:15, ROOM 1105, PHSC

*Text:* Functional Analysis, by Walter Rudin

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*Office hours:* TTH 11:00 - 12:00. If you need help please see me during these office hours or make an appointment. In fairness to other students I cannot discuss the solutions of particular homework problems before they are handed in, but I'll be happy to help you with the material in general.

*Course outline:* According to Wikipedia, "Functional analysis is the branch of mathematics, and specifically of analysis, concerned with the study of spaces of functions and operators acting upon them. It has its historical roots in the study of transformations, such as the Fourier transform, and in the study of differential and integral equations. This usage of the word functional goes back to the calculus of variations, implying a function whose argument is a function. Its use in general has been attributed to mathematician and physicist Vito Volterra and its founding is largely attributed to mathematician Stefan Banach.

In the modern view, functional analysis is seen as the study of complete normed vector spaces over the real or complex numbers. Such spaces are called Banach spaces. An important example is a Hilbert space, where the norm arises from an inner product. These spaces are of fundamental importance in many areas, including the mathematical formulation of quantum mechanics. More generally, functional analysis includes the study of Frchet spaces and other topological vector spaces not endowed with a norm.

An important object of study in functional analysis are the continuous linear operators defined on Banach and Hilbert spaces. These lead naturally to the definition of  $C^*$ -algebras and other operator algebras."

As I see it, this an accurate description and this semester we are going to venture in the area following Rudin's book trying to cover most of the material in chapters 10-13.

*Exams:* There will be two midterm exams during the class period (70 minutes) on Tuesdays, February 26 and April 22. The final exam on Monday, May 5, 8:00-10:00 AM. All exams, including the final, are going to be in the usual room: PHSC 1105.

*Homework:* There will be weekly assignments, to be handed in on Tuesday at the beginning of the class. Please hand in your homework on time (Tuesdays 9:00); late assignments cannot be accepted.

*Final grade:* final exam 49% + midterms 17% + 17% + homework 17%