Winter 2018 Math 205B: Real Analysis  
(Functional Analysis)

This is the second course in the graduate real analysis sequence and we will focus on functional analysis. I will assume that you are familiar with measure theory (as taught in 205A); if you are uncertain whether you have the necessary background, please e-mail me before the end of Week 1.

Course webpage
http://web.stanford.edu/~jluk/math205Bwinter18/index.html

Instructor
Jonathan Luk, jluk@stanford.edu

Course assistant
Laurent Cote, lcote@stanford.edu

Prerequisites
Math 205A or equivalent.

Lectures
MWF 11:30am-12:20pm, McCullough 126

Office Hours
To be determined on the first day of class (check the course webpage for details).

Textbook
Functional Analysis (Methods of Modern Mathematical Physics) by M. Reed and B. Simon

Topics of the course
We will focus on the following topics in functional analysis: Hilbert spaces, Banach spaces, topological spaces, locally convex vector spaces, bounded operators and the spectral theorem. We will also discuss Fourier series and Fourier transform.
Homework assignments

• There will be eight homework assignments. Assignments can be found on the course website (at least) one week before it is due.

• Homworks are due on Wednesdays (starting Week 2) during lectures, except for Week 9 (when the take-home midterm is due).

• No late homework will be accepted without prior approval from the instructor.

• You may (and are in fact encouraged to) discuss the homework problems with others in the class, but you must write up your own solution.

• The final score for the homework assignments will be calculated as the average of all of the assignments, each with an equal weight.

Examinations

• There will be two midterm examinations in total. The first will be an in-class examination, during usual class time on Friday, February 9th (Week 5). The second will be a take-home examination, which will be due on Friday, March 9th (Week 9).

• There will be no final examination.

• If you have an accommodation letter from OAE, please contact me immediately, and no later than the end of Week 1.

• Makeup midterm examinations are only available to students with a clash with other classes or in exceptional situation with prior approval by the instructor. If this applies to you, you should contact me immediately, and no later than the end of Week 1.

Grading policy

The grade will be based on the homework assignments (40%), the in-class midterm exam (25%) and the take-home midterm exam (35%).