Math 5051-Fall 2017
Measure theory and functional analysis I

General information

Location: Cupples I Room 115
Time: MWF 9-10am
Professor: Greg Knese
Office location: Cupples I room 211A
Office hours: 10-11:30am MW or by appointment
Email: geknese at wustl dot edu

Course description

An introductory graduate level course including the theory of integration in abstract and Euclidean spaces, and an introduction to the basic ideas of functional analysis. Math 5051-5052 form the basis for the Ph.D. qualifying exam in analysis. Math 4111 and 4171, or permission of the instructor. More specifically, it is ideal to have some sophistication with epsilon-delta proofs, metric space topology, and basic point-set topology. See the textbook's description of prerequisites as well.

Textbook

A course in abstract analysis by John B. Conway published by the AMS

Exams

The midterm exam is in class October 18, 2017. We may adjust the time so that you have longer than an hour on the exam.
The final exam is December 15, 2017, 8-10am.

Homework

There will be weekly homework assignments. These should be written up clearly and in detail preferably typed using LaTeX. You may discuss the homework verbally with other students provided you have already given the homework a serious attempt. If you have already solved a problem and someone asks you about it, then any help you provide should consist of hints or suggestions and never complete solutions.

In particular, homework should be written up independently and it should not be possible to tell who worked with whom. Do not search or post requests for solutions to HW. Do not post any course materials online without my permission.

Grade breakdown

Homework: 40%
Midterm exam: 20%
Final exam: 40%
Letter grade breakdown: A+=(97,100], A=(93,97], A-=[90,93], similar for B,C,D, F=[0,60).

Course plan

Chapters 1-6 of the course text.

Supplementary References

Real analysis Modern techniques and their applications, by Folland
Real and complex analysis by Rudin
Real analysis: measure theory, integration, and Hilbert spaces by Shakarchi and Stein
Functional analysis: an introduction to further topics in analysis by Shakarchi and Stein
A course in functional analysis by John B. Conway