Math 5052-Spring 2017

Measure theory and functional analysis II

General information

Location: Cupples II L001
Time: MWF 10-11am
Professor: Greg Knese
Office location: Cupples I room 211A
Office hours: M 11am-12pm, Th 3-4pm, F 11am-12pm
Email: geknese at wustl dot edu

Course description

Continuation of Math 5051. Official description: topological groups, Haar measure, topological spaces, Hahn-Banach theorem*, weak topology*, closed graph theorem*, Banach-Steinhaus theorem*, locally convex spaces, Krein-Milman theorem, measures on locally compact spaces. Prerequisites: Math 5051. Note: starred items* were covered in Math 5051.

Textbook

A Comprehensive Course in Analysis Part I, by Barry Simon

Exams

The midterm exam is Friday, March 3 in class. We may find a way to have a longer exam time.
The qualifying/final exam is May 4, 10am-1pm in rooms 199, 6, and 8 in Cupples I.

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

--Ch 2, sections 2.1-2.5. Some sections will not be covered in full detail.
--Assumed known: Ch 3, sections 3.1-3.4, 3.6
--Ch 4, sections 4.3-4.5, 4.6-4.9 (some will be assumed), 4.10, 4.11 (some assumed), 4.19
--Assumed known: Ch 5, sections 5.1-5.5
--Ch 5, sections (2.6, 2.7), 5.7, 5.8, 5.10, 5.11
--Time permitting we may delve into Ch 6.
--We may also discuss the Lebesgue differentiation theorem.

Please look over sections labelled "assumed" and let me know if I they were not covered in 5051.

Supplementary References

Measure and integral An Introduction to Real Analysis, by Wheeden and Zygmund
Real analysis Modern techniques and their applications, by Folland