

**Pre-requisite:** A course in functional analysis (PM 753 or equivalent) and a course in abstract measure theory (PM 451 or equivalent) are required. Familiarity with point-set topology is also required.

**Textbook:** The course will be self-contained and no text is required. I will use the following books for reference:

1. G. B. Folland, *A Course in Abstract Harmonic Analysis*
2. E. Hewitt and K. A. Ross, *Abstract Harmonic Analysis I and II*
3. L. H. Loomis, *Introduction to Abstract Harmonic Analysis*

**Office hours:** Tuesdays 2 - 3 p.m. or by appointment.

**Teaching assistant(s):**

TBA

**Course outline:**

1. Locally compact groups, Haar measure.
2. Convolution of measures, the  $L^1$  group algebra.
3. Unitary representations, positive functions.
4. Abelian harmonic analysis, Pontryagin duality.
5. Compact harmonic analysis, Peter-Weyl Theorem.
6. Induced representations and symmetric imprimitivity.
7. Amenable groups.

**Grading:**

1. Weekly assignments: 80%
2. Talk: 20% (no final exam)

**Assignments:** Roughly bi-weekly assignments due on Crowdmark.

**Talk:** A list of potential topics will be provided around the middle of the term. You need to do a 25-minute presentation and write a short report on the topic. A written report will be due on the last day of the class. Presentation date and time will be announced later.

**Course format:** The course will be entirely online. All materials will be available on Learn. Each Sunday night, I will post new video lectures for the upcoming week. My handwritten lecture notes for the week will be made available together with the video. There will be one weekly office hour each week, starting at 2 p.m. each Tuesday and ending around 3 p.m.. The office hours will be on zoom, and the link will be provided on Learn. You can also book appointments with me directly if you need any extra help.

There will be an online forum (on piazza) for posting questions and answers. Use this to post questions that you have about the course and assignments. Also use it to answer questions of your classmates. I will 'approve' good answers and good questions, and add comments.

**Academic integrity:** I am teaching the course assuming that you are taking it because you want to learn the material. It is in your interest and mine that you strive to learn the material yourself. That means not asking for or receiving too much assistance from classmates or from google. I hope that you enjoy the course and find it challenging, and respect the right of your classmates to do the same.