

MATH 8821– FALL 2025

INTRODUCTION OF REPRESENTATION THEORY OF p -ADIC GROUPS

Instructor: Spencer Leslie, Maloney 543

Office Hours: by appointment

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Schedule: Champion Hall 235, MWF 10:00 AM - 10:50 AM.

Course material:

- Course notes by Fiona Murnaghan at Toronto (available on course webpage)
- the Ottawa lectures on Admissible representations of Reductive p -adic groups
- Iwahori-Matsumoto's article "ON SOME BRUHAT DECOMPOSITION THE STRUCTURE OF THE HECKE RINGS OF p -ADIC CHEVALLEY GROUPS" (available on course webpage)

with more references given as we progress.

Course Description and Goals: The main goal of this course is to understand the basics of representations groups obtained by taking the F -points of a linear algebraic group, where F is a non-archimedean local field. Many results will be studied more thoroughly in case of $SL_2(Q_p)$ and general linear groups.

We will begin by covering p -adic fields, locally compact totally disconnected groups and their representation theory, basic structure theory of p -adic groups. After that we turn to discussing supercuspidal representations and ideas related to the Bernstein decomposition. Special attention will be given to the Iwahori Hecke algebra and its role.

Homework: There is no formal homework, though practice problems and proofs will be suggested throughout the lectures.

Tentative Course Schedule: This will be discussed the first day of class, depending on the background of the audience.