

MATH808–Representations of p -adic groups, Spring 2018

Instructor: Xuhua He

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Course Venue: MWF 11:00am-11:50am, Room B0431, Mathematics Building

Course website: <http://www.math.umd.edu/~xuhuahe/math808P.pdf>

Office Hours: MW 10am-11am, or by appointment

Course Description: We will start by working through part of the notes of Bernstein, Casselman’s book, and the notes of Ngo. We will discuss: structure theory of p -adic groups; definition of smooth and admissible representation; Hecke algebras; notions of unitary/square integrable/supercuspidal representations, and various characterizations of the latter two; induced representations and principal series; Jacquet functors and Frobenius reciprocity; various decompositions of p -adic groups (Bruhat-Tits, Cartan, Iwasawa). In the remaining time, we will discuss how to use the cocenter of the Hecke algebras to understand certain aspects of representations of p -adic groups, based on the recent work of mine.

Prerequisites: I will assume familiarity with basic materials on Lie algebras and Lie groups as in MATH744 (Lie Groups I).

For those taking this course for a grade: I hope that you will attend the lectures and ask question. In addition, I may assign a few homework problems (to verify some statements made in class or to work out some specific examples).

There will be no exams in this course.

References: J. N. Bernstein, Representations of p -adic groups, Notes taken by K. Rumelhart of lectures by J. Bernstein at Harvard in the Fall of 1992, available here.

W. Casselman, Introduction to the theory of admissible representations of p -adic reductive groups, lecture notes at UBC in Spring 1995, available here.

B-C. Ngo, *Harmonic analysis and representation theory of p -adic reductive groups*, lecture notes at U Chicago in Spring 2016, available here.

Homework: There will be several problem sets assigned in the semester.