האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

Introduction to the representation theory of big groups - 80641

Last update 09-09-2023

HU Credits: 2

Degree/Cycle: 2nd degree (Master)

Responsible Department: Mathematics

Academic year: 2024

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: E. Safra

Course/Module Coordinator: Evgeny Strahov

Coordinator Email: strahov@math.huji.ac.il

Coordinator Office Hours:

Teaching Staff:
Prof Evgeny Strahov

Course/Module description:
The seminar is an introduction to representation theory of big groups. We will concentrate on the simplest, yet very nontrivial, example of the infinite symmetric group, and on its deep connections to probability and algebraic combinatorics.
Our main goal will be to understand the proof of the classical Thoma theorem which describes the characters of the infinite symmetric group.

Course/Module aims:

Learning outcomes - On successful completion of this module, students should be able to:
The students will be able to formulate and prove the classical Thoma theorem describing the characters of the infinite symmetric group.

Attendance requirements(%):

Teaching arrangement and method of instruction: Seminar

Course/Module Content:
1) Preliminary facts from representation theory of finite symmetric groups, and the theory of symmetric functions.
2) Coherent systems on the Young graph.
3) Extreme characters.
4) A toy model (the Pascal graph) and de Finetti' theorem
5) Asymptotics of relative dimensions in the Young graph, and the proof of the Thoma theorem.

Required Reading:

A. Borodin, G. Olshanski.
Representations of the infinite symmetric group.

Additional Reading Material:

Grading Scheme:
Presentation / Poster Presentation / Lecture/ Seminar / Pro-seminar / Research proposal 100 %

Additional information:
Prerequisites:
a course on a representation theory
of finte (or compact) groups