

# SYLLABUS, MATH 506 REPRESENTATION THEORY, SPRING 2022

PROFESSOR RINAT KEDEM

This course will cover the basics of representation theory of (finite and compact) groups, Lie algebras (finite and some infinite-dimensional), and (some) quivers.

## 1. TEXTS

This is only a short list, there are many other possible resources and you might prefer another one.

- (1) Serre's *Linear Representations of Finite Groups* is an old classic, efficiently covering the basic results about finite group representations.
- (2) Another classic is Fulton and Harris, *Introduction to representation theory*. This book contains a more advanced treatment than Serre and covers some Lie groups. It also has useful appendices on symmetric function theory and multi-linear algebra.
- (3) The book based on Pavel Etingof's course *Introduction to representation theory* is more modern, and covers some topics not covered in the first two references. It is quite advanced, but has very good exercises.
- (4) Also modern but very different: Gruson and Serganova *A Journey Through Representation Theory*. This book takes some steps towards categorification, which is a popular approach these days.

## 2. EXPECTATION FROM THE STUDENTS:

We have a grader, so some exercises should be turned in as homework – LaTeX is preferred. As graduate students you already know that, in order to really understand the material, you should work out as many exercises as you can apart from the homework. I encourage you to work in groups.

At the end of the semester, each student will prepare and deliver a short (35 minutes) in-class presentation about material related to the course. A short writeup should be prepared as part of the presentation. More details will be provided mid-semester.

The grade will be a combination of written solutions to problems (50%) and class presentation (50%, including writeup and lecture).