INTRODUCTION TO REPRESENTATION THEORY (MATH 6131)

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Course Information

Homepage. `https://people.math.osu.edu/gautam.42/Sp24/RT/reps.html`

Class time and place. 3-3.55PM, MWF: Enarson 218.

Office hours. MWF 10.30-12.

Textbook. P. I. Etingof et al. *Introduction to representation theory.*

Grading. The final letter grade will be determined by your total points earned (out of 200). There will be regularly assigned homework problems (problems will be weighted according to their difficulty level). Students can also opt for giving an in-class presentation on a specialized topic, for 100 points. A list of suggested topics will be made available on our course homepage.

Content. The aim of this course is to familiarize ourselves with the basic problems and techniques of representation theory. We will cover the following topics in class.

(1) General results about representations of associative algebras: Schur's lemma, Jordan-Holder series, Krull-Schmidt theorem, semisimple algebras.
(2) Representation theory of finite groups. Maschke's theorem. Decomposition of the group algebra. Characters. Induced representations.
(3) Irreducible representations of symmetric groups. Frobenius character map. Ring of symmetric functions.
(4) Examples of compact Lie groups. Polynomial representations of general linear group.
(5) Examples of Lie algebras and their representations.
(6) Root systems. Weyl character formula.
(7) Examples of q–deformed algebras (quantum groups).

General Policies

Academic Misconduct. It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct (`http://studentaffairs.osu.edu/info_for_students/csc.asp`).

Disability Services. Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; `http://www.ods.ohio-state.edu/`