The Department of Mathematics
2021–22–B term

Course Name  Introduction to representation theory of groups

Course Number  201.1.0511

Course web page  https://www.math.bgu.ac.il/en/teaching/spring2022/courses/representation-theory

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Office Hours  https://www.math.bgu.ac.il/en/teaching/hours

Abstract

Requirements and grading

Course topics

1. Introduction: Actions of groups on sets. Induced linear actions. Multilinear algebra.


4. Decomposition of the regular representation into irreducible representations. The number of irreducibles is equal to the number of conjugacy classes. Matrix coefficients, characters, orthogonality.

5. Harmonic analysis: Fourier transform on finite groups and the non-commutative Fourier transform.

Information may change during the first two weeks of the term. Please consult the webpage for updates.
6. Frobenius divisibility and Burnside $p^aq^b$ theorem.


8. Induction functor: as adjoint to restrictions, relation to tensor product. Restriction problems, multiplicity problems, Gelfand pairs and relative representation theory.

9. Examples of representations of specific groups: $SL_2$ over finite fields, Icosahedron group, Symmetric groups.

10. Artin and Brauer Theorems on monomial representations