



The Department of Mathematics

2022–23–B term

Course Name Lie Groups

Course Number 201.2.4141

Course web page

<https://www.math.bgu.ac.il/en/teaching/spring2023/courses/lie-groups>

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

Abstract

Requirements and grading¹

Course topics

- .1 Review of differentiable manifolds, definition of a Lie group. Quotients in the category of Lie groups, homogeneous manifolds, Haar measure, connected components.
- .2 Algebraic groups, matrix groups, the classical groups.
- .3 Lie algebras and connection to Lie groups.
- .4 Nilpotent, solvable and semisimple Lie algebras and Lie groups, Lie theorem, Engel theorem, Levi decomposition.
- .5 Cartan-Killing form.
- .6 Representation of a Lie algebra over the complex numbers.
- .7 Root and weights, root systems, Dynkin diagrams, classification of complex semisimple Lie algebras.

¹Information may change during the first two weeks of the term. Please consult the webpage for updates