The Department of Mathematics
2019–20–B term

Course Name  Lie Groups
Course Number 201.2.4141
Course web page  
https://www.math.bgu.ac.il//en/teaching/spring2020/courses/lie-groups

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Abstract

Requirements and grading

Course topics

1. Review of differentiable manifolds, definition of a Lie group. Quotients in 
the category of Lie groups, homogeneous manifolds, haar measure, con-
nected 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 theo-
rem, 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.

\[\text{Information may change during the first two weeks of the term. Please consult the webpage for updates}\]