Mathematics 534, section 101. Lie Theory I
Term 1, 2015, TTh 11:00 - 12:30
Math Annex 1102

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Textbook: James E. Humphreys, Introduction to Lie algebras and representation theory, Springer, 1972.

Course description: Lie theory is the study of continuous group of tranformations. These groups play an important role in various areas of mathematics, from PDEs to number theory, as well as in physics. Their structure is most easily understood by in studying their "linear approximations", otherwise known as Lie algebras. This course we will focus on the study of finite-dimenional Lie algebras and their representations by algebraic methods. We will discuss nilpotent, solvable, and semisimple Lie algebras, classify the root systems, talk about weights, highest weight modules, and universal enveloping algebras. Our ultimate goal will be the classification of simple complex Lie algebras. This material is foundational for many areas of pure mathematics. Our textbook is concise and beautifully written. I plan to follow it closely through much of the term, and cover most of the material in it.

Prerequisites: High comfort level with linear algebra, including Jordan canonical form of a matrix. Familiarity with abstract algebra will also be helpful.

Evaluation: The course mark will be based entirely on homework assignements. I plan to assign 6-9 problem sets throughout the term.

Course page: For detailed up to date information, please see
`http://www.math.ubc.ca/~reichst/534syllF15.html`