MTH 627 — Representation Theory of Lie Algebras
Spring 2017

Instructor:	Ben Salisbury, Assistant Professor
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Office:	Pearce 206H
Office Hours:	Tuesdays 11am–12pm and 2pm–3pm, and by appointment

Meeting Times. TuTh 12:30–1:45pm in Pearce 123A.

Course Text. James E. Humphreys, *Introduction to Lie Algebras and Representation Theory*, Graduate Texts in Mathematics, vol. 9, Springer–Verlag, New York, 1972.

Other useful references.

- Nicolas Bourbaki, *Lie groups and Lie algebras. Chapters 4–6*, Elements of Mathematics (Berlin), Springer-Verlag, Berlin, 2002.
- William Fulton and Joe Harris, *Representation theory*, Graduate Texts in Mathematics, vol. 129, Springer–Verlag, New York, 1991.
- Brian C. Hall, *Lie groups, Lie algebras, and representations*, Graduate Texts in Mathematics, vol. 222, Springer-Verlag, New York, 2003.

Bulletin Description. Lie algebras, semisimplicity, representation of Lie algebras, weights and roots, universal enveloping algebras, character and dimension formulas.

Homework. Homework will be assigned occasionally throughout the semester. Late homework will *not* be accepted. Completion of the homework using LaTeX is *strongly encouraged*!!!! A LaTeX template for the homework will be posted on BlackBoard when each set is assigned.

Exams. There will only be one exam: the final exam. Absolutely no make-up exams will be given without prior permission of the instructor. Validity of excuses is determined by the instructor. If an emergency happened on an exam day, a notice within 24 hours is required in order to make up the missed exam. No technology, besides a writing utensil, is allowed during the exam.

Homework		50%
Final Exam	Thursday, April 27, 2017, 12:30–1:45pm	20%
Presentation	See below	30%

Presentation. Each student[1] will be required to write a short paper (no more than 10 pages) and give a short presentation (20 minutes) on a topic related to the subject studied in class. Some possibilities include Kac–Moody algebras, Lie groups and their connection to Lie algebras, quiver representations and Gabriel's theorem, Lie algebras and algebraic geometry, Lie algebras in physics, and more! Presentations will be given during the Final Exam time slot for our course: Thursday, May 3, 2017, from 10am until 11:50am.

[1] If you decide you work in pairs or groups, each student is still required to contribute about 10 pages for the paper and 20 minutes for the presentation. In other words, a team of two will submit a joint paper of about 20 pages and be required to give a 40-minute presentation.