# Syllabus for MATH 5143 (Spring 2026)
# Introduction to Lie algebras

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| Instructor: | Eric Marberg, eric.marberg@gmail.com |
| | Office: Room 3492 in Mathematics Department, Lift 25-26 |
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| Lectures: | Tuesdays and Thursdays from 4:30PM to 5:50PM |
| | Room 5566, near Lift 27-28 |
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| Website: | https://www.math.hkust.edu.hk/~emarberg/teaching/2026/Math5143/ |
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| Prerequisites: | MATH 2131 and MATH 3131 |
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| Textbook: | *Introduction to Lie Algebras and Representation Theory* by Humphreys |
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| Outline: | This course will be an introduction to the theory of Lie algebras. Beyond the fundamental definitions and examples, the course will include an extended discussion of such topics as nilpotent, solvable, and semisimple Lie algebras; universal enveloping algebras and the PBW-theorem; Cartan subalgebras; roots system; Weyl groups and Dynkin diagrams; the classification of semisimple Lie algebras; representations of semisimple algebras; the Weyl character formula; and the Harish-Chandra isomorphism theorem. Over the 13 week semester we will plan to cover most of Humphrey's textbook. |
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| Grading: | Weekly homework assignments |