

Syllabus for MATH 5112 (Spring 2024)

Advanced Algebra II

- Instructor: Eric Marberg, eric.marberg@gmail.com
Office: Room 3492 in Mathematics Department, Lift 25-26
- Lectures: Tuesdays and Thursdays, 1:30 PM to 2:50 PM
Lectures in Room 2612B, near Lift 31-32
- Website: <http://www.math.hkust.edu.hk/~emarberg/teaching/2024/Math5112/>
- Office hours: By appointment.
- Prerequisites: MATH 5111 (Advanced Algebra I)
- References: Introduction to Representation Theory by Etingof et al.
- Outline: This course will cover several advanced topics in algebra, including group representations, associative algebras, commutative algebra, homological algebra, and category theory. Building on MATH 5111, our main focus will be representation theory, broadly construed. To start, we will review the basics of abstract algebra and the main concepts in representation theory. We will then cover the main general results about representations of associative algebras. The rest of the course will introduce the representation theory of finite groups, quivers, finite dimensional algebras, and so on, as special cases of these general results. Along the way, we will study category theory and abelian categories in particular, in order to apply tools from homological algebra to analyze categories of representations.
- Grading: Homework assignments every 1-2 weeks