

# Representation Theory

A basic LTCC course

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This course will provide an introduction to results from classical and modern representation theory with an emphasis on finite-dimensional algebras over fields. The lectures will be based on the following syllabus.

**Algebras and modules.** Basic definitions and examples, such as group algebras of finite groups.

**Structure theorems.** Wedderburn's theorem on semisimple algebras, the Krull–Schmidt theorem on indecomposable modules, and Maschke's theorem on the semisimplicity of group algebras.

**Projective modules.** Basic definitions, examples and properties of projective modules, and projective covers.

**Representation theory of finite groups.** Basic theory of representations of finite groups, both in characteristic zero and in prime characteristic.