

# Syllabus. Math 171. Modern Algebra. Introduction

*A first course in abstract algebra. J.B. Fraleigh. The seventh edition.*

The topics include groups, subgroups, homomorphisms, cosets, factor groups, symmetry groups, series of groups, and Sylow theorems.

- Elementary group theory. (*Sections* I.0, I.4-I.7, III.13)
  - Sets and relations,
  - groups and subgroups,
  - cyclic groups,
  - homomorphisms of groups.
- Cosets and important families of groups. (*Sections* II.8-II.11.)
  - Groups of permutations,
  - orbits, cycles and alternating groups,
  - cosets and the theorem of Lagrange,
  - direct products and finitely generated Abelian groups.
- Factor groups (*Sections* III.14-III.16.)
  - Factor groups
  - factor-group computations and simple groups,
  - group action on a set.
- Elements of advanced group theory (*Sections* VII.34-VII.37)
  - Isomorphism theorems,
  - series of groups,
  - Sylow theorems,
  - applications of the Sylow theory.