

Course Content

Course Outline

- Week 1: Groups and cyclic groups (DF Chapter 1 and Section 2.3)
 - Day One
 - Day Two
- Week 2: Subgroups and quotient groups (DF Chapter 2 and 3)
- Week 3: Isomorphism theorems and group actions (DF Chapter 3 and 4)
- Week 4: Cauchy and Sylow Theorems; Abelian groups (DF Chapter 4 and 5)
- Week 5: Direct and semi-direct products; applications and classification results (DF Chapter 5)
- Week 6: Rings and ideals (DF Chapter 7)
- Week 7: Ring morphisms; fraction fields; euclidean and principal ideal domains (DF Chapter 7 and 8)
- Week 8: Polynomial rings and unique factorization (DF Chapter 9)
- Week 9: Additional topics on ring theory
- Week 10: Vector spaces and subspaces (DF Chapter 11)
- Week 11: Duality (DF Chapter 11)
- Week 12: Traces and determinants (DF Chapter 11)
- Week 13: Bilinear forms and the spectral theorem (DF Chapter 11)
- Week 14: Additional topics on linear algebra

The study guide to the algebra prelim is available [here](#).

DF refers to *Abstract Algebra, third edition* by Dummit and Foote.