

Course Content

Course Outline

Notes

- 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)
 - Day Three
 - Day Four
- Week 3: Isomorphism theorems and group actions (DF Chapter 3 and 4)
 - Day Five
 - Day Six
- Week 4: Cauchy and Sylow Theorems; Abelian groups (DF Chapter 4 and 5)
 - Day Seven
 - Day Eight
- Week 5: Direct and semi-direct products; applications and classification results (DF Chapter 5)
 - Day Nine
 - Day Ten
- Week 6: Rings and ideals (DF Chapter 7)
 - Day Eleven
 - Day Twelve
- Week 7: Ring morphisms; fraction fields; euclidean and principal ideal domains (DF Chapter 7 and 8)
 - Day Thirteen
 - Day Fourteen
 - Euclidean Algorithm
- Week 8: Quadratic Rings (DF Chapter 7/8 continued)
 - Day Fifteen
 - Day Sixteen
- Week 9: Unique Factorization
 - Day Seventeen
 - Day Eighteen

- Week 10: Vector spaces and subspaces (DF Chapter 11)
 - Day Nineteen
 - Day Twenty
- Week 11: Duality (DF Chapter 11)
 - Day TwentyOne
 - Day TwentyTwo
- Week 12: Traces and determinants (DF Chapter 11)
 - Day TwentyThree
- Week 13: Bilinear forms and the spectral theorem (DF Chapter 11)
 - Day TwentyFour
 - Day TwentyFive
- Week 14: Additional topics on linear algebra
 - Day TwentySix

Problem Sets

- Set 1: Due September 11, 2022
- Comments on Set 1
- Set 2: Due October 2, 2022
- Comments on Set 2
- Set 3: Due October 16, 2022
- Comments on Set 3
- Set 4: Due November 27, 2022
- Comments on Set 4

Exams

- Midterm Take-Home Exam
- Final Take-Home Exam
- Comments on the final exam

Prelim Exam

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

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