

Core Curriculum for Graduate Study

Advanced Algebra I (221U3830)

Instructor: Jungkai A. Chen

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Office Hour: by appointment.

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Fri. 3.4 (10:20-12:10), Fri. 7 (15:30-16:20)

TA: Chen, Jeng-Jie

TA session: Fri. 8 (16:20-17:10)

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Course outline:

1. Set Theory
2. Group theory
 - Basics definitions and properties.
 - Group actions and symmetry.
 - Sylow's theorem.
 - Finitely generated abelian groups.
 - Solvable and nilpotent groups.
3. Field Theory
 - Algebraic extensions.
 - Galois groups
 - Cyclotomic extension and cyclic extensions.
 - Radical extensions.
 - Transcendental extensions.
4. Ring and modules
 - factorization in polynomial rings
 - localization
 - exact sequences
 - Hom
 - Tensor products.

Reference:

1. Hungerford, *Algebra*, GTM 73

2. Lang, *Algebra, GTM 211*
3. Herstein, *Noncommutative rings*
4. Atiyah, MacDonald, *Introduction to commutative algebra*
5. Artin, *Algebra*, Prentice Hall

Grading:

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| 1. Homework | 30% |
| 2. Midterm | 30% |
| 3. Final Examination | 40% |