

# Algebra Preliminary Exam Syllabus

Department of Mathematical Sciences

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Rings, homomorphisms and ideals, quotient rings, integral domains and fraction fields, prime and irreducible elements. Unique factorization domains, principal ideal domains and Euclidean domains, Gauss' lemma. Fields and field extensions, algebraic and transcendental elements, adjunction of roots, finite fields. Galois theory: splitting fields, normal and separable extensions, the Main Theorem of Galois theory. Cyclic and cyclotomic extensions, solvable and radical extensions, insolvability of the quintic equation.

This material is covered in MATH 7003.

Texts:

Dummit and Foote, Abstract Algebra, Parts II and IV.

Lang, Algebra.

Stewart, Galois Theory.

Artin, Galois Theory.