Official Syllabus

Math 420: Abstract Algebra

(Adopted - Fall 2008; Committee: Drs. J. Parish, G. Pelekanos, G.S. Staples, C. Traub)

Catalog Description: [Dist.NSM] Introduction to rings and fields. Rings, fields, integral domains, homomorphisms, factor rings, rings of polynomials, prime ideals, maximal ideals, extension fields, and vector spaces. Prerequisites: Math 320 with a grade of "C" or better or consent of instructor.

Textbook: *A First Course in Abstract Algebra 7th Edition*, John B. Fraleigh, 2002, Addison-Wesley

Course Outline and Topics

IV	**Rings and Fields**
18	Rings and Fields
19	Integral Domains
20	Fermat's and Euler's Theorems
21	The Field of Quotients of an Integral Domain
22	Rings of Polynomials
23	Factorization of Polynomials over a Field
24†	Noncommutative Examples
25†	Ordered Rings and Fields
V	**Ideals and Factor Rings**
26	Homomorphisms and Factor Rings
27	Prime and Maximal Ideals
28†	Gröbner Bases for Ideals
VI	**Extension Fields**
29	Introduction to Extension Fields
30	Vector Spaces
31	Algebraic Extensions
32†	Geometric Constructions
33	Finite Fields

† Optional alternatives.

Any instructor should cover all of the required sections.
It is recommended that one optional topic be included.