



PURE MATHEMATICS 431 "GROUPS, RINGS AND FIELDS"

Calendar Description: H(3-1T)

Factor groups and rings, polynomial rings, field extensions, finite fields, Sylow theorems, solvable groups. Additional topics.

Prerequisite: Mathematics 311 and Pure Mathematics 315 or consent of the Division.

Possible Texts:

J.B. Fraleigh, *A First Course in Abstract Algebra*, 5ed Addison, 1994.

T.W. Hungerford, *Abstract Algebra, an Introduction*, Saunders, 1990.

W.K. Nicholson, *Introduction to Abstract Algebra*, PWS 1993.

Syllabus

<u>Topics</u>	<u>Number of Hours</u>
Factor rings and factor groups, isomorphism and correspondence theorems.	4
Polynomials, factorization of polynomials over a field, factor rings of polynomials over a field.	6
Algebraic field extensions, splitting fields, finite fields, geometric constructions.	10
p-groups, the Sylow theorems, the Jordan-Holder theorem, solvable groups.	6
Suggested Optional Topics:	10
<ul style="list-style-type: none"> • Galois groups and separability • the fundamental theorem of Galois theory • More group theory: nilpotent groups, free groups, abelian groups. 	
TOTAL HOURS	36

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