SALISBURY UNIVERSITY DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE
SYLLABUS
MATH 442/562 *Abstract Algebra*

Objectives: To develop the foundations for modern algebra. The primary focus will be on constructing proofs and writing in mathematics. The standard theory of a second semester algebra course will be presented.

Intended for: All majors in the mathematical sciences and any students who wish to pursue graduate study in mathematics or its applications, physics or computer science.

Prerequisite: MATH 441 with a grade of C or better.

Text: Abstract Algebra: An Introduction, 3rd Edition by Thomas W. Hungerford

Weeks

Topic 1 ***Review of Groups***   1
Definition; subgroups; symmetric group; examples.

Topic 2 ***Structure of Groups***   4
Cayley's Theorem; cosets; Lagrange's Theorem; Fundamental Theorem of Finite Abelian Groups; homomorphisms; isomorphisms; normal subgroups and kernels of homomorphisms; automorphisms; quotient groups; homomorphism theorem for groups; direct products.

Topic 3 ***Field Extensions***   3
Abstract vector spaces; extension fields; finite fields.

Topic 4 ***Galois Theory***   4
Introduction to Galois theory; applications to solvability of polynomials; solvability by radicals; the insolvability of the quintic; impossible geometric constructions.

Topic 5 ***Addition Topics***   1
Additional topics may include Galois theory, module theory, computational algebraic geometry, Sylow theorems, group actions, and other related topics.

Tests   1

   14

EVALUATION
Tests 30-40%
Homework 30-40%
Final exam 20-30%

**Graduate students will be assigned special or additional homework/test problems/projects.

NOTE: ONCE A STUDENT HAS RECEIVED CREDIT, INCLUDING TRANSFER CREDIT, FOR A COURSE, CREDIT MAY NOT BE RECEIVED FOR ANY COURSE WITH MATERIAL THAT IS EQUIVALENT TO IT OR IS A PREREQUISITE FOR IT.