SALISBURY UNIVERSITY DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE
SYLLABUS
MATH 441/561 *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 306 and/or MATH 210 (both recommended).

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

	Weeks
Topic 1 ***Basic Notions*** Sets, functions; binary operations; modular arithmetic.	1
Topic 2 ***Rings*** Mathematical theory of a rings, subrings, integral domains, fields, and division ring; interconnections between these algebraic structures; commutative and noncommutative rings; zero divisors; characteristic and other fundamental ring theoretic topics.	3
Topic 3 ***Polynomials*** Polynomials; the division algorithm; factorization; units; associates; unique factorization domains.	2.5
Topic 4 ***Ideals and Quotient Rings*** Ring homomorphisms; ideals; quotient rings; homomorphism theorem for rings; quotients of polynomial rings.	3
Topic 5 ***Groups*** Definition; elementary properties including cancellation laws, uniqueness of the identity and inverses; unique solvability of linear equations; subgroups and subgroup tests; orders of elements; cyclic groups; modular systems; abelian groups; permutation groups, including the alternating and symmetric groups, cycle notation, and transpositions; dihedral groups and applications to symmetry.	3.5
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.