

SU DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
 SYLLABUS (*Tentative*)
 MATH 441/561 *Abstract Algebra I*

Objectives: To give the student an opportunity to develop an appreciation for and an understanding of the fundamental concepts of algebra with an emphasis on group theory. To develop skills in mathematical argument and proof.

Intended for: Mathematics majors and students with a strong background and interest in mathematics.

Prerequisite: MATH 210 and/or MATH 306 (both recommended).

Texts: “A First Course in Abstract Algebra,” by John Fraleigh; Addison Wesley, 7th edition, 2002.

	Weeks
Topic 1 <i>Basic Notions</i> Sets; functions; binary operations; isomorphic binary structures; relations.	2
Topic 2 <i>Groups</i> 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. Direct products.	5
Topic 3 <i>Structure of Groups</i> Cayley’s Theorem, cosets, Lagrange’s Theorem, Fundamental Theorem of Finite Abelian Groups, Homomorphisms, isomorphisms, normal subgroups and kernels of homomorphisms, automorphisms, quotient groups, Fundamental Homomorphism Theorem.	6
<i>Tests</i>	$\frac{1}{14}$

EVALUATION

Tests	25% - 45%
Homework	25% - 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.