ABSTRACT ALGEBRA
21:640:451, 452 (3 credits, 3 credits)

COURSE DESCRIPTION:
Elementary set theory; fundamental structures of algebra, including semigroups, groups, rings, and fields; homomorphisms and isomorphisms; factor group, rings of residue classes, and other factor structures.

PREREQUISITE:
21:640:238 (Foundations of Modern Math), or 21:640:350 (Linear Algebra), or permission of instructor.

TEXTBOOK:

DEPARTMENT WEB SITE: http://www.ncas.rutgers.edu/math

THIS COURSE COVERS THE FOLLOWING CHAPTERS AND SECTIONS:

Chapter 0:
0.1 Mathematics and proofs
0.2 Sets and relations
0.3 Mathematical induction
0.4 Complex and matrix algebra

Chapter 1: Binary operation
1.1 Isomorphic binary structures
1.2 Groups
1.3 Subgroups
1.4 Cyclic groups and generators

Chapter 2: Groups and Cosets
2.1 Groups of permutation
2.2 Orbits, cycles and alternating groups
2.3 Cosets and Lagrange Theorem
2.4 Direct product and finitely generated Abelian groups

Chapter 3: Homomorphisms
3.1 Homomorphisms
3.2 Factor groups
3.3 Factor group computation and simple groups
3.4 Series of groups