18.703 Modern Algebra

Spring 2015 Tu-Th 3:00–4:00 Room E17–122
V. Kac
Office Hours: by appointment, E17-334

Syllabus

Lecture 1 (February 3): Binary operations, groups, group tables
Lectures 2, 3 (February 5, 10): Cyclic groups, applications to number theory
Lectures 4, 5 (February 12, 19): Groups of permutations, braid groups, dihedral groups
Lecture 6 (February 24): Lagrange's theorem and its applications
Lecture 7 (February 26): Homomorphisms and isomorphisms
Lecture 8 (March 3): Normal subgroups and conjugacy classes, factor groups
Lecture 9 (March 5): Classification of finitely generated abelian groups
Lecture 10 (March 10): Group action, BIRNSIDE formula and applications to combinatorics
Lectures 11, 12 (March 12, 17): Sylow theorems and applications
Lecture 13 (March 19): Test 1
Lecture 14 (March 31): Rings and fields
Lectures 15, 16 (April 2, 7): Integral domains and applications
Lecture 17 (April 9): Fundamental homomorphism theorem, ideals, factor rings. Quaternions
Lecture 18 (April 14): Rings of polynomials, Eisenstein criterion
Lectures 19, 20 (April 16, 23): Principal ideal domains and applications
Lecture 21 (April 28): Euclidean domains
Lecture 22 (April 30): Unique factorization domains and Gauss lemma
Lecture 23 (May 5): Elements of Galois theory, applications to planar geometry
Lecture 24 (May 7): Test 2
Lectures 25, 26 (May 12, 14): Discussion


Grader: Dongkwan Kim