UNIVERSITY OF CALGARY

FACULTY OF SCIENCE
Department of Mathematics and Statistics

Pure Mathematics 315 Abstract Algebra

Integers: division algorithm, prime factorization. Groups: permutations, Lagrange's theorem. Rings: congruences, polynomials.
Course Hours: H(3-1T)
Prerequisite(s): One of Mathematics 211 or 213 or 221.
Notes: Mathematics 271 or 273 is strongly recommended as preparation for this course.

Suggested Text: "Introduction to Abstract Algebra," by W.K. Nicholson, PWS-Kent, 1993.

Syllabus

Topics		**Number of hours**
Section 1.1	Induction	1
Section 1.2, 0.4	Divisibility and Prime Factorization	2
Section 1.3	Integers Modulo n	2
Section 1.4	Permutations	2
Section 2.1	Binary Operations	1
Section 2.2	Groups	1
Section 2.3	Subgroups	2
Section 2.4	Cyclic Groups	2
Section 2.5	Isomorphisms	2
Section 2.6	Cosets and Lagrange's Theorem	1
Section 2.8	Normal Subgroups	1
Section 2.9	Factor Groups	2
Section 2.10	Homomorphisms	2
Section 3.1	Examples and Basic Properties of Rings	1
Section 3.2	Integral Domains and Fields	2
Section 3.3	Ideals and Factor Rings	2
Section 3.4	Homomorphisms	2
Section 4.1	Polynomials	2
Section 4.2	Factorization of Polynomials over a Field	2
Section 4.3	Factor Rings of Polynomials over a Field	2
	TOTAL HOURS	**34**

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Recommendation: 2009:07:01
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