Algebraic Structures with Computer Applications Math3101A, Fall 2009

Instructor: Dr. Steven Wang, 4368HP
Tel: (613) 520 2600 (Ext. 2139)
Email: wang@math.carleton.ca
http://www.math.carleton.ca/∼wang

Lectures: Tuesday, Thursday 4:05pm - 5:25pm, SA 415

Tutorials: Wednesday, 11:35am - 12:25pm, SA 318

Office hours: Tuesday, Thursday 3:00-4:00pm;
Other time is available by appointment.

Textbook: "*Elements of Modern Algebra.*", by Jammie Gilbert and Linda Gilbert (Thomson, 7th edition).

Prerequisites: MATH2107, or permission of the School.

Course Objective: The purpose of this course is to introduce students several "abstract" algebraic structures: groups, monoids, rings, fields. Applications of these concepts to cryptography and coding theory will also be discussed briefly.

Evaluation: Tests (45%) and Final Examination (55 %). **Important**: To pass the course you need at least 30% of term work (equivalent to 13.5% out of 45% of the total marks for tests).

Tutorials: Tutorials begin on September 23, 2009. TA's name and office hour will be announced later.

Tests: There will be four 50 minutes tests held during tutorial time. Each test contributes 15 marks. No make up, early or delayed tests will be given. Medical excuses, other than hospitalization, will not be considered. Best 3 tests out of 4 will be counted. TESTS dates: **Oct. 7, Oct. 21, Nov. 4 and Nov. 18**.

Final Examination: This is a three hour closed-book exam scheduled by the University and will take place sometime during the examination period (Dec . 9- Dec. 22). Students wishing to see their examination papers must make an appointment within three weeks of the examination. This privilege is for you to learn where you went wrong and is not an opportunity to argue about the marking!

Withdrawal: The last day for withdrawal from the course is November. 16, 2009.

Academic Accommodation
You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:
Pregnancy obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: http://carleton.ca/equity/accommodation/student_guide.htm
Religious obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: http://carleton.ca/equity/accommodation/student_guide.htm
Students with disabilities requiring academic accommodations: in this course must register with the Paul Menton Centre for Students with Disabilities (PMC) for a formal evaluation of disability-related needs. Documented disabilities could include but are not limited to mobility/physical impairments, specific Learning Disabilities (LD), psychiatric/psychological disabilities, sensory disabilities, Attention Deficit Hyperactivity Disorder (ADHD), and chronic medical conditions. Registered PMC students are required to contact the PMC, 613-520-6608, every term to ensure that I receive your Letter of Accommodation, no later than two weeks before the first assignment is due or the first in-class test/midterm requiring accommodations. If you only require accommodations for your formally scheduled exam(s) in this course, please submit your request for accommodations to PMC by the last official day to withdraw from classes in each term. For more details visit the PMC website: http://www.carleton.ca/pmc/students/acad_accom.html

Math3101 Tentative lecture schedule–subject to change

Week	Dates	Sections	Topics
1	Sep. 10	1.1-1.3;	Sets, mappings
2	Sep. 14-18	1.4-1.7, 2.1-2.4	Binary operations, Relations, integers, divisibility, primes and gcd; congruences
3	Sep. 21-25	2.5-2.8	Congruence classes, public-key cryptography (RSA)
4	Sep. 28 - Oct. 2	notes	Monoids and applications;
5	Oct. 5-9	3.1-3.3;	Groups; examples; properties; subgroups **Test #1 (Oct. 7)**
6	Oct. 12-16	3.4-3.6	Cyclic groups, Isomorphism; homomorphisms;
7	Oct. 19-23	4.1-4.3	Permutation groups and Cayley's Theorem **Test # 2 (Oct. 21)**
8	Oct. 26-30	4.4-4.5	Normal subgroups and quotients groups;
9	Nov. 2 -6	5.1-5.3	Rings, integral domains, fields; **Test # 3 (Nov. 4)**
10	Nov. 9-13	6.1.-6.2	quotient Ideals and quotient rings; Ring homomorphisms
11	Nov. 16-20	6.4, 7	maximal ideals, complex numbers **Test # 4 (Nov. 18)**
12	Nov. 23-27	8.1-8.4	Polynomials
13	Nov. 30 -Dec. 4	8.6, notes	Algebraic extensions of a field, Algebraic coding theory; course review.