University of Toronto
St. George Campus

Computer Science 238
Fall 1998

CSC 238: DISCRETE MATHEMATICS FOR COMPUTER SCIENCE
Course Information

Instructor: Allan Borodin
Office: SF 2303B   *T*elephone: 978 6416
Office Hours: TR 1:30 – 2:30 pm, or by appointment.
Email: bor@cs.toronto.edu

TAs: Eric Ruppert, Alex Lee, Michael Soltys, Catherine Stinson, Greg Kondrak, Frank Van Bussel

Meeting times:
Lectures: M 10 – 11, F 10 – 11
Tutorials: W 10 – 11 (tutorials are as mandatory as the lectures)

Course requirements:
There will be five homework assignments, a midterm exam and a final exam.

Late homework policy:
Homework assignment will be due at start of tutorial. No late assignments will be accepted (except for medical reasons or other emergencies).

Policy on collaboration in homework assignments:
Limited collaboration in thinking through solutions to homework problems is allowed. No collaboration is allowed in writing up solutions. You may only collaborate with *up to two other people both of whom must be currently taking the course.* Allowed forms of collaboration include brainstorming and discussing general approaches to the problems. After you are done with the talking, however, you must write up your solutions alone. What you hand in must be your own work; if challenged, you must be able to reproduce and explain it by yourself. You may not check your solutions against those of other people, including those you collaborated with. If you realize that a solution you discussed with others is incorrect, you may alert them to that fact but you may not simply tell them what the correct solution is. If you have collaborated with others on a homework, *you must list their names on your homework.* You will not be penalized for doing so; you may be penalized for not doing so.
Violation of these rules constitutes a serious academic offence. In the past such violations have resulted in penalties ranging from receiving zero on the homework to suspension from the university.

Marking scheme:

Homework	40%
Midterm exam	20%
Final exam	40%

To pass this course you *must* get a grade of 35% or better on your final exam. All homeworks will be weighted equally at 8 each

Textbook:

Course notes will be distributed to students at a charge to cover their reproduction cost.

Course goals:

Mathematics is the science of precise reasoning (and not the science of formula manipulation). As such, mathematics provide an indispensable tool for computer science. This course is an introduction to the methodology and techniques of mathematics that are most useful to computer scientists.

Prerequisites:

CSC 148 or equivalent; high-school mathematics.

Tentative Syllabus:

- INDUCTION
  - The principle of mathematical induction and its variants
  - Recursive definitions, structural induction
  - Application of induction to correctness proofs of iterative and recursive algorithms
- RECURRENCES
  - Solution of recurrence equations
  - Application to the time complexity of divide-and-conquer algorithms
- ELEMENTARY LOGIC
  - Introduction to the propositional and predicate calculus
  - Truth tables, tautologies, logical implication and logical equivalence
- FINITE STATE AUTOMATA
  - Regular expressions
  - Finite state automata (FSA)
  - Equivalence of FSA and regular expressions
  - Pumping Lemma and its applications

Course Calendar:

Speak, then, and tell everything. For, it comforts those in pain
To know before hand all the agony they still must bear.

–Aeschylus, Prometheus Bound

Wednesday, September 23	Assignment 1 handed out
Wednesday, October 7	Assignment 1 due and Assignment 2 handed out
Monday, October 12	Thanksgiving — no class
Wednesday, October 21	Assignment 2 due
Week of October 26	Midterm exam (precise day and time, TBA)
Wednesday, October 28	Assignment 3 handed out
Wednesday, November 11	Assignment 3 due and Assignment 4 handed out
Wednesday, November 25	Assignment 4 due and Assignment 5 handed out
Wednesday, December 9	Assignment 5 due