

# Discrete Mathematics for Computer Science I

**Instructor:** David Casperson, **Office:** Lib 444, **Phone:** 960-6672, **e-mail:** casper@unbc.ca  
**Newsgroup:** unbc.cpsc141

**Prerequisites:** Math 12, or MATH 115, or permission of instructor.

<b>Dates:</b>	Homework:	Weekly	<b>Objectives:</b>	to provide an introduction to the mathematical background for Computer Science and computer programming. This course mainly covers material used directly in later Computer Science courses. More importantly, it stresses how to use mathematical reasoning.
	Midterm Test:	<b>Fri, Oct 06</b>		
	Thanksgiving:	Mon, Oct 09		
	Remembrance Day:	Sat, Nov 11		
	Midterm Test:	Fri, Nov 10		
	Course Evaluation:	Wed, Nov 29		
	Final Exam:	3h in 06-15 Dec		

**Times:** Lectures are MWF 15:30-16:20 in **Room** 7-212. There are no assigned labs or tutorials with this course. Office hours are posted on my door.

**Syllabus:** Most of the material covered comes from Chapters 2-6 of Grimaldi. Topics include:

- The Propositional Calculus. Basic Connectives and Truth Tables. Logical equivalence. Logical Implication. Inverses, converses, and contra-positives. The principle of duality.
- Predicate Calculus. Quantifiers. Negation and simplification of quantified statements.
- Set theory. Sets and subsets. Set operations and the laws of set theory. Set operations in terms of predicate calculus. Counting and Venn diagrams. Power sets.
- Mathematical induction. Well-ordered sets. Strong induction.
- Arithmetic. The division algorithm. Prime numbers. Greatest common divisors and least common multiples. Euclid's algorithm.
- Functions and relations. Cartesian products. Relations. Functions. 1-1 functions. Onto functions. Projections. Counting functions and relations.
- Languages and Finite State Machines.

The list of topics may not be exactly as shown above.

**Homework:** I shall assign approximately eight homework assignments. Homework is due *at the beginning of class* on the day it is due, normally Monday. Homework that isn't stapled and legible, or doesn't have a name and student number in the top right hand corner shall result in marks being deducted.

**Marking Scheme** Homework is worth 20% of your mark. There are two one-hour midterm examinations each worth 20% of your mark. There is one three-hour final examination worth 40% of your mark. *I reserve the right to change the weight of any portion of this marking scheme. If changes are made, your grade will be calculated using the original weighting and the new weighting, and you will be given the higher of the two.*

**Text Book:** *Discrete and Combinatorial Mathematics: An Applied Introduction (4<sup>th</sup> edition)*, by Ralph P. Grimaldi. *The 3<sup>rd</sup> edition is substantially similar, and should be an adequate substitute for the 4<sup>th</sup> edition.*

**Recommended Book:** *Schaum's Outline : Discrete Mathematics (2<sup>nd</sup> edition)*, by Seymour Lipshutz and Marc Lipson.

**Cheating:** First-time offenses result in a grade of -100% on the assignment in question and formal notification of the Dean of the College of Science and Management.