CPSC 141—Discrete Mathematics for Computer Science I, Fall/97

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

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

Objectives: 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.

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

- The Propositional Calculus. Basic Connectivevs 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.

Grading Scheme:

Homework:	20%	Weekly
Midterm Test:	20%	**Friday, 10 October**
Midterm Test:	20%	Friday, 14 November
Final Exam:	40%	3h in 08–16 Dec

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.

Lecture times: M W F 9:30–10:20. **Room** 7-238. There are no assigned lab or tutorial times.

Text Book: *Discrete and Combinatorial Mathematics: An Applied Introduction (3^{rd} edition)*, by Ralph P. Grimaldi.

References: *Discrete Mathematics (3^{rd} edition),* by Ross & Wright.

Discrete Mathematics by Biggs.