CAMOSUN COLLEGE	**School of Arts & Science** **MATHEMATICS DEPARTMENT** **MATH 222** **Discrete Mathematics** **Quarter 1 2010**

COURSE OUTLINE

The course description is online @ http://camosun.ca/learn/calendar/current/web/math.html

Ω *Please note: the College electronically stores this outline for five (5) years only.*
*It is **strongly recommended** you keep a copy of this outline with your academic records.*
You will need this outline for any future application/s for transfer credit/s to other colleges/universities.

1. Instructor Information

(a)	Instructor:	Leah Howard		
(b)	Office Hours:	11:30-12:30 daily and by appointment		
(c)	Location:	CBA 147		
(d)	Phone:	370-4448	Alternative Phone:	
(e)	Email:	howardl@camosun.bc.ca		
(f)	Website:	www.leahhoward.com		

2. Intended Learning Outcomes

(No changes are to be made to these Intended Learning Outcomes as approved by the Education Council of Camosun College.)

Upon completion of this course the student will be able to:

1. Use truth tables to establish the equivalence/non-equivalence of compound propositions involving negation, conjunction, disjunction, exclusion or implication, converse, contrapositive, inverse, and biconditional.
2. Solve logic puzzles (including determination of consistency of system specifications).
3. Create propositions from predicates with the use of quantifiers.
4. Prove or disprove theorems by using various methods (direct proofs, proofs by contradiction, mathematical induction; counterexamples).
5. Prove set equivalences using membership, basic set identities and logical equivalences.
6. Describe the growth of functions using big-O, big Omega and big-Theta notation.
7. Show how functions and sequences can be defined recursively.
8. Use the fundamental concepts of number theory to solve problems concerning divisibility, prime factorization and congruences.
9. Use permutations and combinations to solve counting problems (including those in which repetition is allowed).
10. Use recurrence relations to solve counting problems.
11. Construct Euler circuit/path and Hamilton circuit/path.
12. Solve a shortest-path problem.
13. Apply various tree applications (binary tree, Huffman prefix codes, decision tree, game tree).
14. Minimize circuits by using Karnaugh maps and Boolean algebra.

3. Required Materials

(a) *Discrete Mathematics & its Applications* (6th edition) by Kenneth H. Rosen

(b) Scientific Calculator

4. Course Content and Schedule

Propositional Logic (1.1)
Logical Equivalence (1.2)
Quantifiers (1.3)
Nested Quantifiers (1.4)
Rules of Inference (1.5)
Intro to Proofs (1.6)
Proof Methods (1.7)

Sets and Relations (2.1)
Set Operations (2.2)
Functions (2.3)

Algorithms (3.1)
Growth of Functions (3.2)
Complexity (3.3)
The Integers and Division (3.4)
Greatest Common Divisors (3.5)
Integers and Algorithms (3.6)
Applications of Number Theory (3.7)

Mathematical Induction (4.1)
Recursive Definitions (4.3)
Recursive Algorithms (4.4)

Review Counting (5.1, 5.3)
The Pigeonhole Principle (5.2)
Binomial Coefficients (5.4)
Selection with Repetition (5.5)

Recurrence Relations (6.1)
Solving Recurrence Relations (6.2)

Introduction to Graphs (8.1, 8.2)
Representing Graphs (8.3)
Shortest Path Problems (8.6)
Introduction to Trees (9.1)
Applications of Trees (9.2)

Boolean Functions (10.1)
Representing Boolean Functions (10.2)
Logic Gates (10.3)
Minimization of Circuits (10.4)

5. Basis of Student Assessment (Weighting)

(This section should be directly linked to the Intended Learning Outcomes.)

(a) 4 Assignments, worth 10% total

(b) 2 Tests, worth 40% total

(c) Final Exam, worth 50%

Final Exam Policy for all Engineering Bridge Courses
In order to pass the course, you must have a final exam mark of 50% or better. A final exam mark of less than 50% (regardless of term mark) will result in a final grade of F.

6. Grading System

(No changes are to be made to this section unless the Approved Course Description has been forwarded through the Education Council of Camosun College for approval.)

Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D	Minimum level of achievement for which credit is granted; a course with a "D" grade cannot be used as a prerequisite.	1

0-49	F	Minimum level has not been achieved.	0

Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy E-1.5 at **camosun.ca** for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	*Incomplete*: A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	*In progress*: A temporary grade assigned for courses that, due to design may require a further enrollment in the same course. No more than two IP grades will be assigned for the same course. *(For these courses a final grade will be assigned to either the 3rd course attempt or at the point of course completion.)*
CW	*Compulsory Withdrawal:* A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.

7. Recommended Materials or Services to Assist Students to Succeed Throughout the Course

LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College calendar, at Student Services, or the College web site at camosun.ca.

STUDENT CONDUCT POLICY

There is a Student Conduct Policy **which includes plagiarism**.
It is the student's responsibility to become familiar with the content of this policy.
The policy is available in each School Administration Office, at Student Services, and the College web site in the Policy Section.