Course Name: Discrete Mathematics

Department Head/Coordinator: Costa Karavas   Effective Date: September 2015

School or Centre: School of Arts and Science
Department: Mathematics

Course History:
New Course
Name of Replacing Course
(if applicable):

1st Year Post-secondary
Course Number: MATH 1120
Number of Credits: 3.0

Course Pre-requisites (if applicable):
Precalculus 12 with a C; or MATH 1020 with a C; or VCC Math Precalculus Assessment Test (MPT) with a 72%.

Course Co-requisites (if applicable):

PLAR (Prior Learning Assessment & Recognition)  No  Yes (details below):

Course Description:
This course introduces students to mathematical logic, mathematical induction, relations and functions, basic counting techniques, probability, graphs and trees, with an emphasis on applications in computer science.
**Course Learning Outcomes:**

Upon successful completion, students will be able to:

- Recognize/apply main proof strategies within all subdomains of the course.
- Compute the number of outcomes/arrangements using various combinatorial tools.
- Create, interpret, manipulate, and determine the truth values for propositional and quantified formulas.
- Construct and manipulate sets, both finite and infinite, and apply the Inclusion-Exclusion Principle to counting problems.
- Write inductive proofs on structures, including summations and properties of recurrences.
- Manipulate functions and relations, and determine their common properties.
- Use the pigeonhole principle.
- Solve problems and prove theorems related to divisibility, primality, and greatest common divisor.
- Solve basic problems using modular arithmetic.
- Explain basic terminology and traversals of rooted trees.

**Program Learning Outcomes:**

If this course is taken as a requirement or an elective in the following first year, University Transfer Certificate programs, the learning outcomes are found in the relevant Program Content Guides available at the Counselling and Advising Service areas.

University Transfer Computing Science and Software Systems Certificate
Components and Weighting of the Assessment/Evaluation Plan:

<table>
<thead>
<tr>
<th>Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>30</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>35</td>
</tr>
<tr>
<td>Final Exam</td>
<td>35</td>
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</tbody>
</table>

Total 100

Resource Material(s):

Resources are items in addition to tuition that the student is responsible for purchasing. Course resource information will be supplied by the department/instructor.
Course Topics and Sequence Covered:

- Counting
- Logic and Quantifiers
- Set Theory
- Formal Reasoning and Induction
- Functions and Relations
- Number Theory
- Trees

VCC Education and Education Support Policies

There are a number of Education and Education Support policies that govern your educational experience at VCC, please familiarize yourself with them.

The policies are located on the VCC web site at:

http://www.vcc.ca/about/governance--policies/policies/

To find out how this course transfers, visit the BC Transfer Guide at www.bctransferguide.ca.

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| Date Approved by Education Council: | Date Approved by VCC Board (if applicable): |