UNIVERSITY OF THE FRASER VALLEY

**OFFICIAL UNDERGRADUATE COURSE OUTLINE (page 1)**

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|---|---|
| COURSE IMPLEMENTATION DATE: | September 2008 |
| COURSE REVISED IMPLEMENTATION DATE: | January 2011 |
| COURSE TO BE REVIEWED: | May 2012 |
| *(four years after UPAC approval)* | *(month, year)* |

## OFFICIAL UNDERGRADUATE COURSE OUTLINE INFORMATION

Students are advised to keep course outlines in personal files for future use.

Shaded headings are subject to change at the discretion of the department – see course syllabus available from instructor

| MATH 124 | Science/Mathematics and Statistics | 4 |
|---|---|---|
| COURSE NAME/NUMBER | FACULTY/DEPARTMENT | UFV CREDITS |

Finite Math with Applications in the Information Sciences
COURSE DESCRIPTIVE TITLE

**CALENDAR DESCRIPTION:**

This class is intended to reinforce skills in algebra, graphing, and problem solving, and to provide a first introduction to some finite mathematical structures, algorithms, and techniques which are important in discrete math, statistics, and computer science. Topics include algebra and equations; power, polynomial, exponential, logarithmic, and root functions; graphing functions and inequalities; solving linear systems of equations; matrices and basic matrix arithmetic and algebra; use of linear programming to model problems; graphical solution methods for linear programming problems; sets and Venn diagrams; basic principles of probability; and basic counting techniques including combinations and permutations. Whenever possible, concepts will be motivated by applications in the information sciences.

PREREQUISITES: One of the following: C or better in one of Precalculus 11, Foundations of Mathematics 11, Principles of Math 11, or MATH 085; or one of Principles of Math 12, Foundations of Mathematics 12, Precalculus 12, or MATH 094.

COREQUISITES:

PRE or COREQUISITES:

**SYNONYMOUS COURSE(S):**

(a) Replaces:

(b) Cross-listed with:

(c) Cannot take: for further credit.

**SERVICE COURSE TO:** *(department/program)*
CIS

**TOTAL HOURS PER TERM:** 60

STRUCTURE OF HOURS:

| | | |
|---|---|---|
| Lectures: | 60 | Hrs |
| Seminar: | | Hrs |
| Laboratory: | | Hrs |
| Field experience: | | Hrs |
| Student directed learning: | | Hrs |
| Other (specify): | | Hrs |

TRAINING DAY-BASED INSTRUCTION:
Length of course:
Hours per day:

**OTHER:**
Maximum enrolment: **36**
Expected frequency of course offerings: Annually
*(every semester, annually, every other year, etc.)*

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|---|---|---|
| WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only) | ☒ Yes | ☐ No |
| WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department) | ☐ Yes | ☐ No |
| TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE: | ☐ Yes | ☐ No |

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|---|---|---|---|
| Course designer(s): | **Ian Affleck/Cynthia Loten** | | |
| Department Head: | **Greg Schlitt** | Date approved: | **September 1, 2010** |
| Supporting area consultation (Pre-UPAC) | | Date of meeting: | **September 17, 2010** |
| Curriculum Committee chair: | **Norm Taylor** | Date approved: | **September 24, 2010** |
| Dean/Associate VP: | **Ora Steyn** | Date approved: | **October 21, 2010** |
| Undergraduate Program Advisory Committee (UPAC) approval | | Date of meeting: | **October 29, 2010** |

## LEARNING OUTCOMES:

Upon successful completion of this course, students will be able to:

- solve basic algebraic equations in one variable
- determine and compare asymptotic behaviour of power, polynomial, exponential, root, and logarithmic functions, and solve equations and inequalities involving such functions with the aid of graphing technology
- solve linear inequalities in two variables and interpret the solution set graphically
- construct systems of linear equations from a variety of applications
- apply row reduction algorithms to solve small linear systems by hand
- perform basic arithmetic operations with matrices
- use technology to compute the inverse of a matrix
- formulate linear programming restriction sets in a variety of applications
- solve small linear programming problems by graphical methods
- apply Venn diagrams and basic principles of counting to solve elementary counting problems, including problems involving combinations and permutations
- apply basic principles of probability and counting to calculate the probabilities of events in simple applications

## METHODS: *(Guest lecturers, presentations, online instruction, field trips, etc.)*

Lectures may be interspersed with problem sessions. Graphing calculators will be used. In addition, mathematical software may be used.

## METHODS OF OBTAINING PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

☒ Examination(s) ☐ Portfolio assessment ☐ Interview(s)

☐ Other (specify): Please check online at http://www.ufv.ca/math/challenge.htm for the departmental challenge policy

☐ PLAR cannot be awarded for this course for the following reason(s):

## TEXTBOOKS, REFERENCES, MATERIALS: *[Textbook selection varies by instructor. Examples for this course might be:]*

Lial, Hungerford, and Holcomb, Finite Mathematics with Applications, 9th edition, Pearson 2006
Lial, Greenway, and Ritchey, Finite Mathematics, 9th edition, Pearson 2008
Goldstein, Schneider, and Siegel, Finite Mathematics & its Applications, 9th edition, Pearson 2007

## SUPPLIES / MATERIALS:

A graphing calculator will be required.

## STUDENT EVALUATION: *[An example of student evaluation for this course might be:]*

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|---|---|
| Quizzes and assignments | 20% |
| Midterm exams | 40% |
| Final exam | 40% |

## COURSE CONTENT: *[Course content varies by instructor. An example of course content might be:]*

1. Algebra and Equations:
   The real numbers; polynomials and factoring; rational expressions; exponents and radicals; linear and quadratic equations

2. Functions and Graphs:
   Linear, quadratic, polynomial, exponential, and logarithmic functions; graphs, end behaviour and applications of the above functions; running time of algorithms

3. Linear Algebra:
   Systems of linear equations; solutions by row reduction (by hand and using technology); matrix arithmetic and multiplication; matrix inverses; applications in information sciences

4. Linear Programming:
   Graphing linear inequalities in two variables; solutions by graphical methods; applications

5. Introduction to Set Theory:
   Sets; union, intersection and complement; Venn diagrams

6. Introduction to Counting and Probability:
   The multiplication principle; permutations and combinations; probability and odds; basic rules of probability