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|  | <p><b>School of Arts &amp; Science</b></p> <p><b>Department of Mathematics &amp; Statistics</b></p> <p><b>MATH 109-005</b></p> <p><b>Finite Mathematics</b></p> <p><b>Fall 2017</b></p> |
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## COURSE OUTLINE

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

**[?]** 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.

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### 1. Instructor Information

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|-----|----------------------|-------------------------------------------------------------------------|
| (a) | <b>Instructor:</b>   | Amanda Malloch                                                          |
| (b) | <b>Office Hours:</b> | Mondays and Wednesdays 2:00 - 3:00pm or by appointment.                 |
| (c) | <b>Location:</b>     | Belmont A111                                                            |
| (d) | <b>Phone:</b>        | 250-686-0072                                                            |
| (e) | <b>Email:</b>        | <a href="mailto:MallochA@camosun.bc.ca">MallochA@camosun.bc.ca</a>      |
| (f) | <b>Website:</b>      | D2L ( <a href="http://online.camosun.ca">http://online.camosun.ca</a> ) |

### 2. Intended Learning Outcomes

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

1. Solve counting problems using sets and/or the multiplication principle, and recognize and solve problems involving permutations and combinations.
2. Apply the basic properties and concepts of probability to solve problems from fields such as medicine and quality control. Determine the probability distributions for random variables and calculate expected values. Where appropriate, evaluate probabilities using the binomial distribution. Explore systems evolving from one state to another using Markov chains.
3. Solve linear systems of equations using techniques, including Gauss-Jordan elimination and inverse matrices.
4. Solve linear programming problems using a graphical approach.
5. Derive simple annuity formulas and use them to solve amortization problems.
6. Translate statements into symbolic form and vice versa. Construct truth tables for propositions, including implications. Use truth tables to verify equivalencies.

### 3. Required Materials

- (a) Texts: *Finite Mathematics*, Custom Edition for Camosun College. The second custom edition has a turquoise cover, while the first custom edition (which is potentially usable) had a green cover. Please ask if you have any questions.
- (b) Other: Non-graphing, non-programmable calculator (preferably Sharp EL-531). No other electronic devices, including cell phones, iPods, electronic translators, etc. are permitted.

#### 4. Course Content and Schedule

##### 1. Linear Equations and Straight Lines

- 1.1: Coordinate Systems and Graphs
- 1.2: Linear Inequalities
- 1.3: The Intersection Point of a Pair of Lines
- 1.4: The Slope of a Straight Line

##### 2. Linear Programming, A Geometric Approach

- 2.1: A Linear Programming Problem
- 2.2: Fundamental Theorem of Linear Programming
- 2.3: Linear Programming

##### 3. Sets and Counting

- 3.1: Sets
- 3.2: A Fundamental Principle of Counting
- 3.3: Venn Diagrams and Counting
- 3.4: The Multiplication Principle
- 3.5: Permutations and Combinations
- 3.6: Further Counting Techniques

##### 4. Probability

- 4.1: Experiments, Outcomes, Sample Spaces, and Events
- 4.2: Assignment of Probabilities
- 4.3: Calculating Probabilities of Events
- 4.4: Conditional Probability and Independence
- 4.5: Tree Diagrams
- 4.6: Bayes' Theorem, Natural Frequencies

##### 5. Random Variables

- 5.1: Random Variable, Probability Distribution, and Expected Value
- 5.2: Bernoulli Trials and Binomial Distribution

##### 6. Matrices

- 6.1: Systems of Linear Equations with Unique Solutions
- 6.2: General Systems of Linear Equations
- 6.3: Arithmetic Operations on Matrices
- 6.4: The Inverse of a Matrix
- 6.5: The Gauss-Jordan Method for Calculating Inverses

##### 7. Markov Chains

- 7.1: Properties of Markov Chains
- 7.2: Regular Markov Chains

##### 8. Mathematics of Finance

- 8.1: Simple Interest
- 8.2: Compound and Continuous Compound Interest
- 8.3: Future Value of an Annuity; Sinking Funds
- 8.4: Present Value of an Annuity; Amortization

##### 9. Logic

- 9.1: Introduction to Logic
- 9.2: Truth Tables
- 9.3: Implications
- 9.4: Logical Implication and Equivalence

## 5. Basis of Student Assessment (Weighting)

(a) Assignments (10%)

(b) Quizzes (40%)

There will be 6 quizzes written in class, tentatively scheduled for Sept 20<sup>th</sup>, Oct 4<sup>th</sup>, Oct 18<sup>th</sup>, Nov 1<sup>st</sup>, Nov 15<sup>th</sup>, Nov 29<sup>th</sup>.

(c) Final Exam (50%).

The final exam will be 3 hours long and cover material from the entire course. It will be scheduled by the College during the final exam period of December 11<sup>th</sup>-19<sup>th</sup>. **You must write the final exam at the scheduled time as per Camosun College's policy on final examinations.**

See [camosun.ca/learn/calendar/current/pdf/academic-policies.pdf](https://camosun.ca/learn/calendar/current/pdf/academic-policies.pdf).

## 6. Grading System

### 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](https://camosun.ca) for information on conversion to final grades, and for additional information on student record and transcript notations.

| Temporary Grade | Description                                                                                                                                                                                                                                                                                                                                 |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I               | <i>Incomplete</i> : 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              | <i>In progress</i> : 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 3 <sup>rd</sup> course attempt or at the point of course completion.) |
| CW              | <i>Compulsory Withdrawal</i> : 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](http://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.

#### Important Dates:

|                  |                                    |
|------------------|------------------------------------|
| Sept 6th:        | First day of class                 |
| Sept 19th:       | Fee deadline                       |
| Oct 9th:         | Thanksgiving Day (no class)        |
| Nov 13th:        | Remembrance Day Closure (no class) |
| Dec 6th:         | Last day of class                  |
| Dec 11th – 19th: | Exam Period                        |