



## 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:	Raymond Lai
(b)	Office Hours:	Monday, Tuesday, Thursday and Friday 11:30am – 12:20pm Wednesday 10:30am – 11:20am
(c)	Location:	CBA 152
(d)	Phone:	250-370-4491
(e)	Email:	<a href="mailto:lai@camosun.bc.ca">lai@camosun.bc.ca</a>
(f)	Website:	<a href="http://faculty.camosun.ca/raymondlai/">http://faculty.camosun.ca/raymondlai/</a>

### 2. Intended Learning Outcomes

Upon completion of this course, using a calculator as necessary, the student will be able to:

1. Solve separable and linear first-order differential equations.
2. Use the numerical methods of Euler and Runge-Kutta to find approximate solutions to first-order differential questions.
3. Solve second-order linear homogeneous and non-homogeneous differential equations with constant coefficients.
4. Solve application problems involving first and second-order differential equations, including mass-spring systems.
5. Calculate probabilities using the following: basic properties, simple events, counting techniques, conditional probability, independence, and Bayes' theorem.
6. Graph a data set using a variety of presentations. Calculate the mean, median, and standard deviation of a data set and interpret the results.
7. Solve problems involving discrete probability distributions such as binomial, Poisson, and hyper-geometric, and continuous probability distributions such as the normal distribution. Calculate point estimates and confidence intervals for both large and small samples.
8. For a bivariate data set, calculate the linear regression line using the method of least squares, either using a scientific calculator or using appropriate software (Excel, Matlab, etc.). Calculate and interpret the coefficients of correlation and determination.

### 3. Required Materials

- (a) Reference Text:
  - Allyn J. Washington, Basic Technical Mathematics with Calculus, SI Version, 10th Ed.
  - Schaum's Outline: Beginning Statistics (2nd edition) by Larry J. Stephens, McGraw-Hill (2006)
- (b) Scientific Calculator (Graphing Calculators are not permitted.)

#### 4. Course Content and Schedule

Differential Equations (Reference: Washington)

- Section 1 Solutions of Differential Equations (Ref: Section 31.1)
- Section 2 Separation of Variables (Ref: Section 31.2)
- Section 3 First Order Linear Differential Equations (Ref: Section 31.4)
- Section 4 Numerical Solution: Euler's Method and Runge-Kutta (RK4) Method (Ref: Section 31.5)
- Section 5 Applications of First Order Differential Equations (Ref: Section 31.6)
- Section 6 Higher Order Homogeneous Linear Differential Equations (Ref: Sections 31.7, 31.8)
- Section 7 Higher Order Nonhomogeneous Linear Differential Equations (Ref: Section 31.9)
- Section 8 Applications of Higher Order Linear Differential Equations (Ref: Section 31.10)

Statistics and Probability (Reference: Stephens)

- Section 9 Counting Techniques (Ref: Chapter 4)
- Section 10 Introduction to Probability (Ref: Chapter 4)
- Section 11 Bayes' Theorem (Ref: Chapter 4)
- Section 12 Introduction to Statistics (Ref: Chapter 2)
- Section 13 Pictures of Data (Ref: Chapter 2)
- Section 14 Measures of Central Tendency (Ref: Chapters 1, 3 and 5)
- Section 15 Measures of Variation (Ref: Chapter 3 and 5)
- Section 16 Interpretation of Standard Deviation (Ref: Chapter 3)
- Section 17 Binomial Distribution (Ref: Chapter 5)
- Section 18 Hypergeometric Distribution (Ref: Chapter 5)
- Section 19 Poisson Distribution (Ref: Chapter 5)
- Section 20 Continuous Probability Density Functions (Ref: Chapters 5 and 6)
- Section 21 Normal Distribution (Ref: Chapters 3 and 6)
- Section 22 Estimate of Population Mean (Ref: Chapters 7 and 8)
- Section 23 Estimate of Population Variance (Ref: Chapter 11)
- Section 24 Linear Regression (Ref: Chapter 13)

#### 5. Basis of Student Assessment (Weighting)

To get a C or better in the course, you must get 50% or higher in the final exam \*and\* have an overall average of 60% or higher; your numerical grade will be computed using the following two components:

- 3 Term Tests (total 50%)
  - Tentatively scheduled on Friday 15th April (test 1: 10%), Friday 6th May (test 2: 20%), Friday 27th May (test 3: 20%)
  - Thorough understanding of the examples discussed in class and the assignment problems will be essential for success on the term tests.
  - Requests for makeup term tests due to illness must be supported by your physician's note.
- Comprehensive Final Exam (50%)
  - During the week of 20 – 24 June.
  - As stated in the college calendar, "Students are expected to write tests and final examinations at the scheduled time and place. ... Exceptions, due to emergency circumstances, such as unavoidable employment commitments, health problems, or unavoidable family crisis, require approval of the appropriate instructor. Holidays or scheduled flights are not considered to be emergencies. The student may be required to provide verification of the emergency circumstances."

which is then converted to a letter grade using the standard Camosun grade scale (see Grading System (6) below).

There is one exception: if your term work is at least 50% \*and\* you received 60% or higher in the final exam, then you will receive a C in the course \*even if\* your overall average is under 60%.

## 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](http://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. ( <i>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.</i> )
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.