



**MATH-108-002**  
**Applied Calculus**  
**Summer 2019**

**COURSE OUTLINE**

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

\* Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.

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**1. Instructor Information**

(a) Instructor	Amanda Malloch
(b) Office hours	Mondays – Thursdays 1:00-2:00 pm, or by appointment
(c) Location	Ewing 254
(d) Phone	250-686-0072 <b>Alternative:</b> _____
(e) E-mail	MallochA@camosun.bc.ca
(f) Website	D2L available through www.camosun.ca

**2. Intended Learning Outcomes**

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

1. Find the limit of elementary functions as the independent variable approaches some finite value or approaches infinity.
2. Find the derivative of simple functions using the definition of the derivative.
3. Find the derivative of functions (polynomial, trigonometric, logarithmic and exponential functions) using the product, quotient and chain rule.
4. Find the derivative using implicit differentiation.
5. Solve problems involving rates of change.
6. Find relative and absolute extrema of functions.
7. Sketch graphs of functions identifying such features as relative extrema, intervals where the function is increasing and decreasing, points of inflection, intervals where the function is concave up and concave down, and asymptotes.
8. Solve problems that involve maximizing or minimizing some variable associated with the problem.
9. Find the approximate area under a curve using the area of a set of approximating rectangles.
10. Evaluate a definite and an indefinite integral of polynomial, trigonometric, logarithmic and exponential functions using the Fundamental theorem of Calculus.
11. Evaluate integrals using the method of substitution.
12. Use integration to find the area between two curves.
13. Evaluate a definite and indefinite integral by the method of integration by parts.
14. Solve elementary differential equations using the method of separation of variables.
15. Solve problems using differential and integral calculus that involve applications from business and/or biological sciences.

### 3. Required Materials

- (a) Text: RN Greenwell, Np Ritchey and ML Lial, *Calculus with Applications for the Life Sciences*, Custom Third Edition for Camosun College, Pearson.
- (b) Calculator: As per department policy, the only calculator permitted for use on tests and the final exam is the Sharp EL-531 (or EL-510R) scientific calculator. No other make/model of calculator is permitted, nor are other electronic devices such as cell phones, iPods, electronic translators, etc

### 4. Course Content and Schedule

#### Chapter 1:

- 1.1 – Lines and Linear Functions
- 1.3 – Properties of Functions
- 1.4 – Quadratic Functions; Translations and Reflections
- 1.5 – Polynomial and Rational Functions

#### Chapter 2:

- 2.1 – Exponential Functions
- 2.2 – Logarithmic Functions
- 2.3 – Applications: Growth and Decay
- 2.4 – Trigonometric Functions

#### Chapter 3:

- 3.1 – Limits
- 3.2 – Continuity
- 3.3 – Rates of Change
- 3.4 – Definition of Derivative
- 3.5 – Graphical Differentiation

#### Chapter 4:

- 4.1 – Techniques for Finding Derivatives
- 4.2 – Derivatives of Products and Quotients
- 4.3 – The Chain Rule
- 4.4 – Derivatives of Exponential Functions
- 4.5 – Derivatives of Logarithmic Functions
- 4.6 – Derivatives of Trigonometric Functions

#### Chapter 5:

- 5.1 – Increasing and Decreasing Functions
- 5.2 – Relative Extrema
- 5.3 – Higher Derivatives, Concavity and the Second Derivative Test
- 5.4 – Curve Sketching

#### Chapter 6:

- 6.1 – Absolute Extrema
- 6.2 – Applications of Extrema
- 6.3 – Implicit Differentiation
- 6.4 – Related Rates
- 6.5 – Differentials: Linear Approximation

#### Chapter 7:

- 7.1 – Antiderivatives
- 7.2 – Substitution Method of Integration
- 7.3 – Area and the Definite Integral
- 7.4 – Fundamental Theorem of Calculus
- 7.5 – Area Between Two Curves

#### Chapter 8:

- 8.2 – Integration by Parts

#### Chapter 11:

- 11.1 – Differential Equations

## 5. Basis of Student Assessment (Weighting)

- (a) Assignments 10%  
We will have regular in-class and online homework assignments (using WebWork).
- (b) Tests 40% (10% each)  
Tentatively scheduled for:  
Wednesday, May 29<sup>th</sup>  
Wednesday, June 19<sup>th</sup>  
Wednesday, July 10<sup>th</sup>  
Wednesday, July 31<sup>st</sup>
- (c) Exam 50%  
The final exam is scheduled by Camosun College and will occur sometime between August 12<sup>th</sup> and August 20<sup>th</sup>.

## 6. Grading System

- Standard Grading System (GPA)
- Competency Based Grading System

## 7. College Supports, Services and Policies



### Immediate, Urgent, or Emergency Support

If you or someone you know requires immediate, urgent, or emergency support (e.g. illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts @ <http://camosun.ca/about/mental-health/emergency.html> or <http://camosun.ca/services/sexual-violence/get-support.html#urgent>

### College Services

Camosun offers a variety of health and academic support services, including counselling, dental, disability resource centre, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit the **STUDENT SERVICES** link on the College website at <http://camosun.ca/>

### College Policies

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies. Policies are available on the College website at <http://camosun.ca/about/policies/>. Education and academic policies include, but are not limited to, Academic Progress, Admission, Course Withdrawals, Standards for Awarding Credentials, Involuntary Health and Safety Leave of Absence, Prior Learning Assessment, Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, Student Appeals, Student Conduct, and Student Penalties and Fines.

## A. GRADING SYSTEMS <http://camosun.ca/about/policies/index.html>

The following two grading systems are used at Camosun College:

### 1. 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		1
0-49	F	Minimum level has not been achieved.	0

### 2. Competency Based Grading System (Non GPA)

This grading system is based on satisfactory acquisition of defined skills or successful completion of the course learning outcomes

Grade	Description
COM	The student has met the goals, criteria, or competencies established for this course, practicum or field placement.
DST	The student has met and exceeded, above and beyond expectation, the goals, criteria, or competencies established for this course, practicum or field placement.
NC	The student has not met the goals, criteria or competencies established for this course, practicum or field placement.

## B. 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 at <http://camosun.ca/about/policies/index.html> 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 are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
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.

## 9. Important Dates

May 6th:	First day of class
May 20th:	Victoria Day (no class)
May 21st:	Drop date and Fee deadline
July 1st:	Canada Day (no class)
July 10th:	Last day to drop without academic penalty
Aug 5th:	BC Day (no class)
Aug 10th:	Last day of class
Aug 12th – 20th:	Exam Period