

	<p><b>School of Arts &amp; Science</b>  <b>MATHEMATICS DEPARTMENT</b></p> <p><b>MATH 108-003</b>  <b>Applied Calculus</b>  <b>2010F</b></p>
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## COURSE OUTLINE

The Approved Course Description is available on the web @ \_\_\_\_\_

Ω Please note: this outline will be electronically stored for five (5) years only.  
It is strongly recommended students keep this outline for your records.

### 1. Instructor Information

(a)	Instructor:	Laura Shepherd		
(b)	Office Hours:	Monday-Thursday 8:30-9:00, 12:00-12:30, 2:30-3:00		
(c)	Location:	Ewing 258		
(d)	Phone:	370-3504	Alternative Phone:	
(e)	Email:	shepherd@camosun.bc.ca		
(f)	Website:	See math department page.		

### 2. Intended Learning Outcomes

(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.)

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)	Texts	Calculus with Applications Seventh, Eighth, or Ninth Edition Author - Lial, Greenwell and Ritchey
(b)	Other	

### 4. Course Content and Schedule

*(Can include: class hours, lab hours, out of class requirements and/or dates for quizzes, exams, lectures, labs, seminars, practicums, etc.)*

#### CHAPTER 1: LINEAR FUNCTIONS

#	Text	Time	
1	1.1	1	Slopes and Equations of Lines
2	1.2	2	Linear Functions and Applications

#### CHAPTER 2: NONLINEAR FUNCTIONS

#	Text	Time	
3	2.1	1	Properties of Functions
4	2.2	3	Quadratic Functions; Translation and Reflection
5	2.3	2	Polynomial and Rational Functions

#### CHAPTER 3: THE DERIVATIVE

#	Text	Time	
6	3.1,3.2	1	Limits and Continuity
7	3.3	1	Rates of Change
8	3.4	1	Definition of the Derivative
9	3.5	1	Graphical Differentiation

#### CHAPTER 4: CALCULATING THE DERIVATIVE

#	Text	Time	
10	4.1	2	Techniques for Finding Derivatives
11	4.2	1	Derivatives of Products and Quotients
12	4.3	1	The Chain Rule
		1	TEST 1, Lessons 1 to 12

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#### CHAPTER 5: GRAPHS AND THE DERIVATIVE

#	Text	Time	
13	5.1	1	Increasing and Decreasing Functions
14	5.2	1	Relative Extrema
15	5.3	2	Higher Derivatives; Concavity; The Second Derivative Test
16	5.4	2	Asymptotes and Curve Sketching

CHAPTER 6+12: APPLICATIONS OF THE DERIVATIVE

#	Text	Time	
17	6.1	1	Absolute Extrema
18	6.2	2	Applications of Extrema
19	6.3	1	A Further Applications from Business: Economic Lot Size
20	6.4	1	Implicit Differentiation
21	6.5	2	Related Rates
22	12.6	1	Newton's Method for Solving Equations
23	6.6	1	Differentials: Linear Approximation
		1	TEST 2, Lessons 13 to 22

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EXPONENTIAL AND LOGARITHMIC FUNCTIONS

#	Text	Time	
24	2.4	1	Exponential Functions
25	2.5	2	Logarithmic Functions
26	2.6	2	Applications: Growth and Decay; Finance
27	4.4	.5	Derivatives of Exponential Functions
28	4.5	.5	Derivatives of Logarithmic Functions

CHAPTER 7: INTEGRATION

#	Text	Time	
29	7.1	1	Antiderivatives
30	7.2	1	Integration by Substitution
31	Notes	1	Area
32	7.4	1.5	The Fundamental Theorem of Calculus
33	7.5	1.5	The Area Between Two Curves
		1	TEST 3, Lessons 23 to 32

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MORE INTEGRATION

#	Text	Time	
34	8.1	2	Integration by Parts; Tables of Integrals
35	10.1	1	Solutions of Elementary and Separable Differential Equations

CHAPTER 13: THE TRIGONOMETRIC FUNCTIONS

#	Text	Time	
36	13.1	2	Definitions of the Trigonometric Functions
37	13.2-13.3	2	Calculus with Trigonometric Functions
		1	TEST 4, Lessons 33 to 36

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

*(Should be linked directly to learning outcomes.)*

(a)	Term tests	50%. Four in-class tests.
(b)	Final exam	50% or 100% if higher than term mark

Your final grade will be determined on the basis of Term Work worth 50% and a comprehensive Final Exam worth 50%. The term work consists of 6 in-class Quizzes (50%). The final exam is 3 hours long and will be written during the week following the end of classes, the time and place will be scheduled by the College. Your final exam mark may count for 100% replacing your in-class tests provided that

you have written all of your in-class tests and attained at least a 50% average (collectively) on these tests.

ATTENDANCE: Attendance is not mandatory, however as this is an intense course it is highly recommended. If you must miss a lecture let me know and I can inform you of what was covered. If you must miss a test due to illness, it is very important that you contact me as soon as possible. There are no makeup test.

## 6. Grading System

*(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.)*

### 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 at [camosun.ca](http://camosun.ca) or 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.

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.

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 on the College web site in the Policy Section.