



**MATH-100-D01**  
**Calculus 1**  
**Winter 2021**

**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	Laura Shepherd
(b) Office hours	By email: Monday – Friday 10:30 – 11:20am
(c) Location	N/A
(d) Phone	N/A
(e) E-mail	shepherd@camosun.bc.ca
(f) Website	https://online.camosun.ca/d2l/home

**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. Define continuity.
3. Find the derivative of simple functions using the definition.
4. Find the derivative of functions (polynomial, trigonometric, logarithmic and exponential functions) using the product, quotient and chain rule.
5. Find the derivative using implicit differentiation.
6. Solve problems involving rates of change.
7. Find relative and absolute extrema of functions.
8. 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.
9. Solve problems that involve maximizing or minimizing some variable associated with the problem.
10. Solve equations using Newton's method.
11. Find the area under a curve using the limit of the area of a set of approximating rectangles.
12. Evaluate a definite and an indefinite integral of polynomial, trigonometric, logarithmic and exponential functions using the Fundamental theorem of Calculus.
13. Use the Mean Value Theorem of integrals to find the mean value of a continuous function.
14. Evaluate integrals using the method of substitution.
15. Evaluate definite integrals using the trapezoidal rule and Simpson's rule.
16. Solve elementary differential equations using the method of separation of variables.

### 3. Required Materials

*Calculus, 11<sup>th</sup> edition, Larson, Hostetler & Edwards*

### 4. Course Content and Schedule

We will be covering the following sections from the textbook:

#### Chapters and Sections

- P. Preparation for Calculus
  - P.1 Graphs and Models
  - P.2 Linear Models and Rates of Change
  - P.3 Functions and Their Graphs
  - P.4 Review of Trigonometric Functions
- 1. Limits and Their Properties
  - 1.1 A Preview of Calculus
  - 1.2 Finding Limits Graphically and Numerically
  - 1.3 Evaluating Limits Analytically
  - 1.4 Continuity and One-Sided Limits
  - 1.5 Infinite Limits
- 2. Differentiation
  - 2.1 The Derivative and the Tangent Line Problem
  - 2.2 Basic Differentiation Rules and Rates of Change
  - 2.3 Product and Quotient Rules and Higher-Order Derivatives
  - 2.4 The Chain Rule
  - 2.5 Implicit Differentiation
  - 2.6 Related Rates
- 3. Applications of Differentiation
  - 3.1 Extrema on an Interval
  - 3.2 Rolle's Theorem and the Mean Value Theorem
  - 3.3 Increasing and Decreasing Functions and the First Derivative Test
  - 3.4 Concavity and the Second Derivative Test
  - 3.5 Limits at Infinity
  - 3.6 A Summary of Curve Sketching
  - 3.7 Optimization Problems
  - 3.8 Newton's Method
  - 3.9 Differentials
- 4. Integration
  - 4.1 Antiderivatives and Indefinite Integration
  - 4.2 Area
  - 4.3 Riemann Sums and Definite Integrals
  - 4.4 The Fundamental Theorem of Calculus
  - 4.5 Integration by Substitution
- 5. Logarithmic, Exponential, and Other Transcendental Functions
  - 5.1 The Natural Logarithmic Function: Differentiation
  - 5.2 The Natural Logarithmic Function: Integration
  - 5.3 Inverse Functions
  - 5.4 Exponential Functions: Differentiation and Integration
  - 5.5 Bases Other Than  $e$  and Applications
- 6. Differential Equations
  - 6.2 Growth and Decay
  - 6.3 Separation of Variables and the Logistic Equation
- 8. Integration Techniques and Improper Integrals
  - 8.6 Numerical Integration (*covered after sec 4.5*)

## 5. Basis of Student Assessment (Weighting)

**Your internet connection and technology problems are your responsibility and are not a valid excuse to miss an assignment, quiz or exam.**

### (a) Assignments (10%)

Assignments are due no later than midnight of the due date. Late assignments will not be accepted.

**Practice Assignment:** (no marks) Due Friday January 22nd

**Assignment One:** Due Friday January 5th

**Assignment Two:** Due Friday February 26th

**Assignment Three:** Due Friday March 19th

**Assignment Four:** Due Friday April 16th

### (b) Quizzes (40%)

There are no make-up quizzes. If you are going to miss a quiz for any reason please let me know BEFORE the quiz takes place.

**Quiz One:** (During scheduled class time.) Tuesday January 26th

**Quiz Two:** (During scheduled class time.) Tuesday February 9th

**Quiz Three:** (During scheduled class time.) Tuesday March 9<sup>th</sup>

**Quiz Four:** (During scheduled class time.) Tuesday March 23<sup>th</sup>

**Quiz Five:** (During scheduled class time.) Thursday April 8<sup>th</sup>

### (c) Final Exam (50%)

Students MUST be available to write the exam at the scheduled time.

**Final Exam Period: April 19 - 27**

## Academic Integrity:

The Department of Mathematics and Statistics has prepared a handout called "Student Guidelines for Academic Integrity" to help you interpret college policies involving student conduct, academic dishonesty, plagiarism, etc. It is your responsibility to become familiar with the contents of the document and the college policies it references. This document can be found in the "Course Documents" module of D2L.

The School of Arts and Science has prepared its own set of Academic Honesty Guidelines, which you should also review. It can be found under the heading "Academic Resources" on the school webpage [camosun.ca/learn/school/arts-science/archives/index.html](https://camosun.ca/learn/school/arts-science/archives/index.html).

The move to online learning and assessment brings with it some new challenges. With regard to academic integrity, the key point to remember is

*The work you submit must be your own!*

When writing quizzes, you may not seek or obtain help from anyone else. That includes family, friends, classmates, tutors, websites, etc. You may use a basic scientific calculator, such as the Sharp EL-531, or other similar calculator or similarly capable program or app, but you may not use more advanced tools like Maple, Wolfram|Alpha, graphing calculators, etc.

You are expected to be able to write quizzes without reference to any books, notes, or other materials. Nevertheless, you are permitted to refer to your course notes and/or the textbook, but no other resources. Keep in mind that if you find yourself having to look something up in your notes or the textbook, you will likely not finish your quiz on time.

With regard to assignments, your work must again be your own. Collaboration with other students is permitted so long as it does not turn into plagiarism. Needless to say, you may not use "homework cheat" websites such as Chegg, Slader, Course Hero, etc.

***Minimum consequences for academic dishonesty in this course are as follows:***

***Assignments:*** The student will receive a zero for all of the assignment.

***Quizzes:*** The student will receive a zero for the quiz.

***Final Exam:*** The student will receive a zero on the exam and an infraction report will be issued to the school of Arts and Science.

## 6. Grading System

Standard Grading System (GPA)

Competency Based Grading System

## 7. Recommended Materials 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).

*Note: No electronic devices of any sort (e.g., cell phones, ipods, translators) other than the Sharp EL 531W are allowed on tests.*

## 8. 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.