CAMOSUN COLLEGE
School of Arts & Science
Department of Mathematics & Statistics

MATH-100-001
Calculus 1
Fall 2019

COURSE OUTLINE

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

Ω *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.*

1. Instructor Information

(a)	**Instructor**	**Chedo Barone**		
(b)	**Office hours**	**Mon - Fri 12:30 - 1:20**		
(c)	**Location**	**E266**		
(d)	**Phone**	**250-370-3504**	**Alternative:**	**n/a**
(e)	**E-mail**	**baronec@camosun.bc.ca**		
(f)	**Website**	**D2L: login at http://online.camosun.ca**		

2. Intended Learning Outcomes
(If any changes are made to this part, then the Approved Course Description must also be changed and sent through the approval process.)

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

Textbook: Ron Larson and Bruce Edwards, *Calculus of a Single Variable,* 11th Edition, Nelson (Cengage), 2018.

Calculator: Sharp EL-531 calculator (or Sharp EL-510R). This is the only calculator that will be permitted for tests and exams.

4. Course Content and Schedule

Note about Credit: Only one of MATH 100 or MATH 108 may be used toward a Camosun credential.

Exit Grade: A grade of at least C (60%) is required when this course is used as a prerequisite for entry into MATH 101, MATH 126, STAT 218 or any other Camosun course.
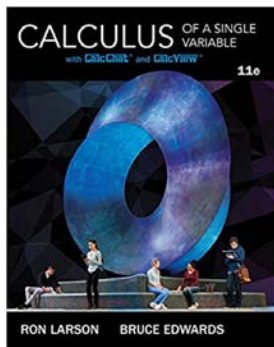
Course Content: **Chapters and Sections**
P.   Preparation for Calculus
    P.1   Graphs and Models
    P.2   Linear Models and Rates of Change
    P.3   Functions and Their Graphs
    P.4   Review of Trigonometric Functions
1.   Limits and Their Properties
    1.1   A Preview of Calculus
    1.2   Finding 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

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.

Calculator Policy: 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 calculator or any other electronic device including cell phones, electronic translators, smartwatches, iPods, etc. is allowed.

Homework: There will be periodic assignments to be handed in for marking, due dates for which will be posted on the course webpage. Collaboration with your classmates is permitted, but you must submit your own work. Don't let collaboration turn into plagiarism. LATE ASSIGNMENTS WILL NOT BE ACCEPTED.

Maple Labs: Maple labs will take place in the computer labs Ewing 115. See the Math 100 Schedule, which is posted on D2L, for the dates of the labs. With the exception of Lab 0, all other labs have a pre-lab component which should be completed **before** coming to the lab.

Tests: There will be three tests for this course (October 3, October 31, November 28). Each of these tests will be written in class, and will have a duration of 50 minutes. You will not be permitted the use of a formula sheet on these tests. The coverage for these test will be announced in class, and posted on D2L the week before the test.

Test Absences: If you miss a test for a legitimate reason such as illness, accident or family affliction, you should notify me *as soon as possible* and provide supporting documentation. There will be no "make-up" tests. In the event of an excused absence for a test, the mark from the relevant portions of the final exam will replace your test mark. If you miss a test are not excused, then a mark of zero will be given for that test or quiz.

Final Exam: A comprehensive, 3-hour final exam will take place during the final exam period of December 9-14, 16-17. The specific date, time, and location will be announced on or about October 18. 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/procedures.html#academic.

5. Basis of Student Assessment (Weighting)

Grade Calculation: The final grade will be calculated according to the following breakdown:

Assignments:	15%*
Maple Labs:	5%
Term Tests:	30% (10% for each term test)
Final Exam:	50%

* Note: The lowest assignment mark will be dropped when calculating the assignment average. This allows you to miss one assignment without penalty.

6. Grading System

| X | Standard Grading System (GPA) |

| | Competency Based Grading System |

7. Recommended Materials to Assist Students to Succeed Throughout the Course

A&S Math Lab:

Ewing 224: This drop-in centre is freely available for your use to work on math homework and to seek help from the instructional assistant. Hours are posted on the door or online at camosun.ca/services/help-centres/#MATH.

Estimated out-of-class time:
To be successful in this course, you should expect to spend about 10 hours per week studying and doing the suggested problems.

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	*Incomplete*: 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	*In progress*: 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	*Compulsory Withdrawal*: 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.