



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:	George Ballinger		
(b)	Office Hours:	See below		
(c)	Location:	E256		
(d)	Phone:	250-370-3116	Alternative Phone:	N/A
(e)	Email:	ballinger@camosun.bc.ca		
(f)	Website:	georgeballinger.ca		

2. Intended Learning Outcomes

(No changes are to be made to these Intended Learning Outcomes as approved by the Education Council of Camosun College.)

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

- (a) Texts
- (b) Other

SEE BELOW

4. Course Content and Schedule

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

SEE BELOW

5. Basis of Student Assessment (Weighting)

(This section should be directly linked to the Intended Learning Outcomes.)

- (a) Assignments
- (b) Quizzes
- (c) Exams
- (d) Other (e.g., Attendance, Project, Group Work)

SEE BELOW

6. Grading System

(No changes are to be made to this section unless the Approved Course Description has been forwarded through the Education Council of Camosun College 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 E-1.5 at 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 3rd 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.

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.



Mathematics 100 Calculus 1 Fall, 2017

Instructor: George Ballinger
Office: Ewing 256
E-mail: ballinger@camosun.bc.ca
Website: georgeballinger.ca (click the [MATH 100](#) link for course information)
Telephone: 250-370-3116
Timetable:

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8:30 am - 9:20 am					
9:30 am - 10:20 am	MATH 100-004 Room Y217	MATH 100-004 Room Y217	MATH 100-004 Room Y217	MATH 100-004 Room Y217	MATH 100-004 Room Y217
10:30 am - 11:20 am	MATH 100-003 Room Y217	MATH 100-003 Room Y217	MATH 100-003 Room Y217	MATH 100-003 Room Y217	MATH 100-003 Room Y217
11:30 am - 12:20 pm	Office Hour E256	Office Hour E256	Office Hour E256	Office Hour E256	Office Hour E256
12:30 pm - 1:20 pm					
1:30 pm - 2:20 pm					
2:30 pm - 3:20 pm		A&S Chairs Meeting			
3:30 pm - 4:20 pm					

Important Dates:

September 5	First day of class
September 19	Fee deadline
October 9	Thanksgiving Day (no class)
October 19	"ShakeOut" earthquake preparedness drill at 10:19am
November 7	Withdrawal deadline
November 13	Remembrance Day observed (no class)
December 8	Last day of class
December 11-16, 18-19	Final exam period

Calendar Description: For mathematics and science students. Topics include limits, derivatives of algebraic, trigonometric, logarithmic and exponential functions, applications of differentiation and the Fundamental Theorem of Calculus. Students will complete some assignments using Maple. [4 Credits]

(Source: Camosun College Calendar
camosun.ca/learn/calendar/current/web/math.html#MATH100)

Prerequisites: B in Pre-calculus 12, Principles of Math 12, or MATH 115; or A in MATH 107; or assessment.

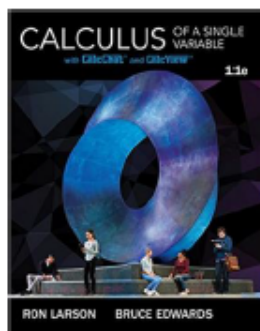
Note about Credit: Credit may be obtained for only one of MATH 100 and MATH 108.

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.

Textbook:

Ron Larson and Bruce Edwards, *Calculus of a Single Variable*, 11th Edition, Brooks/Cole, 2018.

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

Learning Outcomes:	<p>The Intended Learning Outcomes for this course, as approved by the Education Council, are as follows. Upon completion of this course the student will be able to:</p> <ol style="list-style-type: none"> 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.
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 (see hours posted on door or online at camosun.ca/services/help-centres/math.html#mathlabs).
Support and Services:	There are a variety of services available that can assist you throughout your learning. For more information please see camosun.ca/services .
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. are allowed.
Homework:	There will be periodic assignments to be handed in for marking. Collaboration with your classmates is permitted, but you must submit your own work. LATE ASSIGNMENTS WILL NOT BE ACCEPTED.
Maple Labs:	Maple labs will take place in the computer lab Ewing 115 on the following Thursdays: Sep 14, Sep 28, Oct 12, Oct 26, Nov 9, and Nov 23.
Tests:	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, the mark from your final exam or relevant subset thereof will replace your test mark.

Final Exam: A comprehensive, 3-hour final exam will take place during the final exam period of December 11-16, 18-19. The specific date, time, and location will be announced on or about October 20. 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.

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

Assignments: 15%*
Maple Labs: 5%
Term Tests: 30%
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.

Grade Scale: Final letter grades are assigned as follows:

0-49	50-59	60-64	65-69	70-72	73-76	77-79	80-84	85-89	90-100
F	D	C	C+	B-	B	B+	A-	A	A+

For information on Camosun College's grading policy, see policy E-1.5 on the webpage camosun.ca/about/policies/policies.html#education.