



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

MATH-191-X04
Applied Math for Civil/Mech 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	Raymond Lai				
(b) Office hours	Monday	Tuesday	Wednesday	Thursday	Friday
	Noon – 12:50	Noon – 12:50	12:05 – 12:30	2:30 – 3:20	10:30 – 11:00
(c) Location	CBA 152				
(d) Phone	250-370-4491	Alternative: _____			
(e) E-mail	lai@camosun.bc.ca				
(f) Website	http://sites.camosun.ca/raymondlai/				

2. Intended Learning Outcomes

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

1. Evaluate limits of functions. Using the limit definition, find derivatives of simple algebraic functions. Use derivatives to determine the slope of the tangent line to a curve, velocity, acceleration, and rates of change.
2. Use the power, product, quotient and chain rules to differentiate algebraic, trigonometric, logarithmic and exponential functions. Use implicit differentiation.
3. Find tangents and normals to given functions. Use Newton's Method to find an approximate solution to an equation. Solve problems involving related rates, curve sketching, maxima and minima, and parametrically defined curves. Find differentials, estimate errors, and linearize functions.
4. Find antiderivatives of functions and evaluate both indefinite and definite integrals. Use the trapezoidal rule and Simpson's Rule to approximate a definite integral.
5. Use integration to solve applications problems including the area between curves, volumes of solids of revolution, and centroids.
6. Calculate determinants of 2x2 and 3x3 matrices. Add, subtract and multiply matrices. Calculate the inverse of a matrix. Solve 2x2 and 3x3 linear systems using Gauss-Jordan elimination, augmented matrices and inverse matrices.

3. Required Materials

- (a) Reference: Allyn J. Washington, Basic Technical Mathematics with Calculus, SI Version, 10th Ed.
- (b) Scientific Calculator (Graphing Calculators are not permitted).

4. Course Content and Schedule

Section 1	Limits (Reference section 23.1)
Section 2	Slope of a Tangent to a Curve (Reference section 23.2)
Section 3	The Derivative (Reference section 23.3)
Section 4	Derivatives of Polynomials (Reference section 23.5)
Section 5	Derivatives as an Instantaneous Rate of Change (Reference section 23.4)
Section 6	Higher Derivatives (Reference section 23.9)
Section 7	Derivatives of Products and Quotients (Reference section 23.6)
Section 8	Derivatives of Powers of Functions & Chain Rule (Reference section 23.7)
Section 9	Derivatives of Implicit Functions (Reference section 23.8)
Section 10	Tangents and Normals (Reference section 24.1)
Section 11	Newton's Method for Solving Equations (Reference section 24.2)
Section 12	Curvilinear Motion (Reference section 24.3)
Section 13	Related Rates (Reference section 24.4)
Section 14	Using Derivatives in Curve Sketching (Reference sections 24.5)
Section 15	Applied Max/Min Problems (Reference section 24.7)
Section 16	Linear Approximations (Reference section 24.8)
Section 17	Derivatives of Sine and Cosine Functions (Reference section 27.1)
Section 18	Derivatives of the Other Trigonometric Functions (Reference section 27.2)
Section 19	Derivatives of the Inverse Trigonometric Functions (Reference section 27.3)
Section 20	Derivatives of the Logarithmic Functions (Reference sections 27.5)
Section 21	Derivatives of Exponential Functions (Reference section 27.6)
Section 22	Applications (Reference section 27.4 and section 27.8)
Section 23	Antiderivatives (Reference section 25.1)
Section 24	Indefinite Integral (Reference section 25.2)
Section 25	Area Under a Curve (Reference section 25.3)
Section 26	Definite Integral (Reference section 25.4)
Section 27	Numerical Integration: Trapezoidal Rule (Reference section 25.5)
Section 28	Numerical Integration: Simpson's Rule (Reference section 25.6)
Section 29	Applications of the Indefinite Integral (Reference section 26.1)
Section 30	Areas by Integration (Reference section 26.2)
Section 31	Volumes by Integration (Reference section 26.3)
Section 32	Centroids (2-dimensional only) (Reference section 26.4)
Section 33	Other Applications (Reference section 26.6)
Section 34	Introduction to Matrices: Definitions and Basic Operations (Reference section 16.1)
Section 35	Matrix Multiplication (Reference section 16.2)
Section 36	Matrix Inverses (Reference section 16.2 and section 16.3)
Section 37	Matrices and Linear Equations (Reference section 16.4)
Section 38	Gaussian Elimination and Gauss Jordan Elimination (Reference section 16.5)

Tentative Assessment Schedule				
Term Tests: (50%)	Test 1 (14%)	Test 2 (14%)	Test 3 (14%)	Test 4 (8%)
	Oct 2 nd (Wed)	Oct 30 th (Wed)	Nov 20 th (Wed)	Dec 4 th (Wed)
Comprehensive Final Exam: (50%)	December 9 – December 17			

5. Basis of Student Assessment (Weighting)

4 Term Tests for a total of 50%
Final Exam for 50%

Requests for makeup term tests and final exam due to illness must be supported by your physician's note.

If your term grade is at least 50% **and** your final exam grade is higher than your term grade, then your final exam grade will count as 100% of the course grade.

6. Grading System

Standard Grading System (GPA)

Competency Based Grading System

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

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.