



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

MATH-191-DX02
Applied Math for Civil/Mech 1
Fall 2020

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	Susie Wieler
(b) Office hours	Wednesdays 3:30-4:20 pm
(c) Location	online
(d) Phone	Alternative: _____
(e) E-mail	wielers@camosun.bc.ca
(f) Website	D2L

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

Coursepack and Problem Sets: available for printing or tablet use.

Optional Textbook: Allyn J. Washington and Michelle Boué, *Basic Technical Mathematics with Calculus*, SI Version, 10th Ed.

Scientific Calculator (graphing calculators are not permitted). The **SHARP EL-531X** is strongly recommended.

4. Course Content and Schedule

Ch.23 The Derivative

- Limits (23.1)
- The Slope of a Tangent to a Curve (23.2)
- The Derivative (23.3)
- The Derivative as an Instantaneous Rate of Change (23.4)
- Derivatives of Polynomials (23.5)
- Derivatives of Products and Quotients of Functions (23.6)
- The Derivative of a Power of a Function (23.7)
- Differentiation of Implicit Functions (23.8)
- Higher Derivatives (23.9)

Ch.24 Applications of the Derivative

- Tangents and Normals (24.1)
- Newton's Method (24.2)
- Curvilinear Motion (24.3)
- Related Rates (24.4)
- Using Derivatives in Curve Sketching (24.5)
- Applied Maximum and Minimum Problems (24.7)
- Differentials and Linear Approximations (24.8)

Ch.27 Transcendental Functions

- Derivatives of the Sine and Cosine Functions (27.1)
- Derivatives of the Other Trigonometric Functions (27.2)
- Derivatives of the Inverse Trigonometric Functions (27.3)
- Derivatives of the Logarithmic Function (27.5)
- Derivatives of the Exponential Function (27.6)
- Applications (27.8)

Ch.25 Integration

- Antiderivatives (25.1)
- The Indefinite Integral (25.2)
- The Area Under a Curve (25.3)
- The Definite Integral (25.4)
- Numerical Integration: The Trapezoidal Rule (25.5)
- Simpson's Rule (25.6)

Ch.26 Applications of Integration

- Applications of The Definite Integral (26.1)
- Areas by Integration (26.2)
- Volumes by Integration (26.3)
- Centroids (26.4)
- Other Applications (26.6)

Ch.16 Matrices; Systems of Linear Equations

- Definitions and Basic Operations (16.1)
- Multiplication of Matrices (16.2)
- Finding the Inverse of a Matrix (16.3)
- Matrices and Linear Equations (16.4)
- Gaussian Elimination (16.5)
- Higher-Order Determinants (16.6)

5. Basis of Student Assessment (Weighting)

Term Mark: 25% weekly assignments, 75% biweekly tests

Course Mark: Option 1: Term Mark

Option 2: 50% Term Mark, 50% Final Exam

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.

6. Grading System

- Standard Grading System (GPA)
- Competency Based Grading System

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

wolframalpha.com and desmos.com both provide free online graphing calculators

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.