



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

MATH-191-X02
Applied Math for Civil/Mech 1
Fall 2018

COURSE OUTLINE

1. Instructor Information

(a) Instructor	Gilles Cazelais
(b) Office hours	http://pages.pacificcoast.net/~cazelais/schedule.html
(c) Location	CBA 158
(d) Phone	250-370-4495
(e) E-mail	Cazelais@camosun.bc.ca
(f) Website	http://pages.pacificcoast.net/~cazelais/191.html

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 2×2 and 3×3 matrices. Add, subtract and multiply matrices. Calculate the inverse of a matrix. Solve 2×2 and 3×3 linear systems using Gauss-Jordan elimination, augmented matrices and inverse matrices.

3. Required Materials

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

Note: the exercises and solutions from this textbook are posted on D2L, and are available for printing at the Satellite Printshop in the CBA main floor Atrium

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

5. Basis of Student Assessment (Weighting)

- Four tests: 50%
- Comprehensive Final Exam: 50%

6. Grading System

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

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

Interurban Math Lab

Services Individual tutoring and study space

Location TEC 142

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.