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

MATH-191 DX01
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 <u>not</u> 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**	Leah Howard
(b)	**Office hours**	Tuesdays and Fridays 1:30-2:20
(c)	**Location**	Online. Link will be sent to students by email before each office hour.
(d)	**Phone**	Please use email **Alternative:**
(e)	**E-mail**	HowardL@camosun.ca
(f)	**Website**	www.leahhoward.com

Free math help is also available in the MATH LAB. Email Duncan at mcdougalld@camosun.ca to request an invitation. You can then access the Math Lab by signing into Microsoft Teams.

Tips for Success:
1) Watch lecture videos during each scheduled lecture to stay on track
2) Videos will be less than 50 minutes long, so you will have extra time to drop into office hours

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. 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
* Scientific calculator. (Graphing calculators are not permitted.)
The Sharp EL-531 is recommended; you can buy this at the Camosun Bookstore (they will mail it to you) or Walmart, Staples etc. Or you may use an online calculator such as www.calculator.net/scientific-calculator.html

* No required textbook. Suggested homework problems and answers are on D2L.

* An optional textbook is *Basic Technical Mathematics with Calculus*, SI Version (10th Ed) by Washington and Boue. You can order this from the Camosun Bookstore and they will mail it to you.

4. Course Content
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

Assignments 1-7	10% of final grade total	(1 or 2 questions per assignment)
Tests 1-4	72% of final grade (18% each)	
Assignment 8	18% of final grade	

You will have approximately 50 minutes to write each test. A thorough understanding of the course material will be required to complete the test during the time limit.

Tests will take place during scheduled class time on Sept 23, Oct 14, Nov 4, Nov 25
If you miss a test for any reason, you must write a make-up test.

There will be an optional final exam. If you choose to write this, your final grade will be determined as follows: 50% Term Mark and 50% Exam Mark. The exam will be three hours long and will take place during the official exam period (December 14-22).

Academic Integrity

Academic dishonesty is NOT tolerated and the consequences can be severe.

Academic Integrity Guidelines for Assignments, Tests and Exam
You MAY use your own notes and any resources on the course website: notes, videos, formula sheet etc
You may NOT copy from other people (including classmates, friends/family, tutors, homework sites like Chegg)

Possible disciplinary actions include:
* You receive zero on the assignment or test
* An Academic Infraction Report is added to your academic record.

6. Grading System
(If any changes are made to this part, then the Approved Course description must also be changed and sent through the approval process.)
(Mark with "X" in box below to show appropriate approved grading system – see last page of this template.)

X	Standard Grading System (GPA)

	Competency Based Grading System

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.

7. Recommended Materials to Assist Student Success Throughout the Term

Tips for Success:
1) Watch lecture videos during each scheduled lecture to stay on track
2) Videos will be less than 50 minutes long, so you will also have time to attend office hours
3) Do your Suggested Homework Problems each time we finish a section
4) Use the Math Lab (instructions on first page of this document)

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.