COURSE SYLLABUS

CAMOSUN
COLLEGE

COURSE TITLE: MATH-191: Applied Math for Civil/Mech 1

CLASS SECTION: X03

TERM: Fall 2022

COURSE CREDITS: 3

DELIVERY METHOD(S):   Face-to-Face

Camosun College campuses are located on the traditional territories of the Lək̓ʷəŋən and W̱SÁNEĆ peoples. We acknowledge their welcome and graciousness to the students who seek knowledge here. Learn more about Camosun's [Territorial Acknowledgement](.).

For COVID-19 information please visit https://legacy.camosun.ca/covid19/index.html

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable explanation in advance, you will be removed from the course and the space offered to the next waitlisted student.

INSTRUCTOR DETAILS

NAME: Leah Howard

EMAIL: HowardL@camosun.ca

OFFICE: CBA 151

HOURS: Monday to Friday 11:30-12:20

WEBSITE: www.leahhoward.com

As your course instructor, I endeavour to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me. Camosun College is committed to identifying and removing institutional and social barriers that prevent access and impede success.

CALENDAR DESCRIPTION

Students will be introduced to the topics in introductory calculus and matrix algebra necessary to achieve competency in civil and mechanical engineering technology. In calculus, students will study limits; differentiation of algebraic, trigonometric, logarithmic and exponential functions; applications of derivatives; indefinite and definite integrals; and applications of integrals. Students will also learn about matrix operations, matrix inverses, and solving 2x2 and 3x3 linear systems using a variety of methods. Applications to civil and mechanical engineering are included throughout the course.

PREREQUISITE(S):
One of:
• C+ in Pre-calculus 12
• C+ in MATH 097
• C in MATH 107
• C in MATH 115
CO-REQUISITE(S): Not Applicable
EXCLUSION(S):   Not Applicable

COURSE LEARNING OUTCOMES / OBJECTIVES

Upon completion of this course a 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.

REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

* Scientific calculator. (Graphing calculators are not permitted.)
The Sharp EL-W516 is recommended; available at the Camosun Bookstore or Walmart, Staples etc.

* 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.

COURSE SCHEDULE, TOPICS, AND ASSOCIATED PREPARATION / ACTIVITY / EVALUATION

The following schedule and course components are subject to change with reasonable advance notice, as deemed appropriate by the instructor.

A detailed pacing schedule can be found on the last page of this outline.

Course Topics:
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)

Students registered with the Centre for Accessible Learning (CAL) who complete quizzes, tests, and exams with academic accommodations have booking procedures and deadlines with CAL where advanced noticed is required. Deadlines scan be reviewed on the [CAL exams page](http://camosun.ca/services/accessible-learning/exams.html).
http://camosun.ca/services/accessible-learning/exams.html

EVALUATION OF LEARNING

DESCRIPTION		WEIGHTING
Weekly Quizzes End of class on Tuesdays, starting in Week 2. Each quiz will be approximately ten minutes long. Your two lowest quiz grades will be dropped.		25% total
Test 1 (see pacing schedule for coverage)		25%
Test 2 (see pacing schedule for coverage)		25%
Test 3 (see pacing schedule for coverage)		25%
There is an optional final exam. It's three hours long and covers the entire course. If you choose to write it then your evaluation weighting will be: Weekly Quizzes 15% total Test 1 15% Test 2 15% Test 3 15% Final Exam 40% The final exam period is Dec 12-20.		
	TOTAL	100%

If you have a concern about a grade you have received for an evaluation, please come and see me as soon as possible. Refer to the Grade Review and Appeals policy for more information.
http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf

COURSE GUIDELINES & EXPECTATIONS

Academic Integrity

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

Possible disciplinary actions include:

* You receive zero on the test

* An Academic Infraction Report is added to your academic record.

SCHOOL OR DEPARTMENTAL INFORMATION

Free math help is available in the MATH LAB in TEC 142.

STUDENT RESPONSIBILITY

Enrolment at Camosun assumes that the student will become a responsible member of the College community. As such, each student will display a positive work ethic, assist in the preservation of College property, and assume responsibility for their education by researching academic requirements and policies; demonstrating courtesy and respect toward others; and respecting expectations concerning attendance, assignments, deadlines, and appointments.

SUPPORTS AND SERVICES FOR STUDENTS

Camosun College offers a number of services to help you succeed in and out of the classroom. For a detailed overview of the supports and services visit http://camosun.ca/students/.

Academic Advising	http://camosun.ca/advising
Accessible Learning	http://camosun.ca/accessible-learning
Counselling	http://camosun.ca/counselling
Career Services	http://camosun.ca/coop
Financial Aid and Awards	http://camosun.ca/financialaid
Help Centres (Math/English/Science)	http://camosun.ca/help-centres
Indigenous Student Support	http://camosun.ca/indigenous
International Student Support	http://camosun.ca/international/
Learning Skills	http://camosun.ca/learningskills
Library	http://camosun.ca/services/library/
Office of Student Support	http://camosun.ca/oss
Ombudsperson	http://camosun.ca/ombuds
Registration	http://camosun.ca/registration
Technology Support	http://camosun.ca/its
Writing Centre	http://camosun.ca/writing-centre

If you have a mental health concern, please contact Counselling to arrange an appointment as soon as possible. Counselling sessions are available at both campuses during business hours. If you need urgent support after-hours, please contact the Vancouver Island Crisis Line at 1-888-494-3888 or call 911.

Academic Accommodations for Students with Disabilities

The College is committed to providing appropriate and reasonable academic accommodations to students with disabilities (i.e. physical, depression, learning, etc). If you have a disability, the Centre for Accessible Learning (CAL) can help you document your needs, and where disability-related barriers to access in your courses exist, create an accommodation plan. By making a plan through CAL, you can ensure you have the appropriate academic accommodations you need without disclosing your diagnosis or condition to course instructors. Please visit the CAL website for contacts and to learn how to get started: http://camosun.ca/services/accessible-learning/

Academic Integrity

Please visit http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.13.pdf for policy regarding academic expectations and details for addressing and resolving matters of academic misconduct.

Academic Progress

Please visit http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.1.pdf for further details on how Camosun College monitors students' academic progress and what steps can be taken if a student is at risk of not meeting the College's academic progress standards.

Course Withdrawals Policy

Please visit http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.2.pdf for further details about course withdrawals. For deadline for fees, course drop dates, and tuition refund, please visit http://camosun.ca/learn/fees/#deadlines.

Grading Policy

Please visit http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf for further details about grading.

Grade Review and Appeals

Please visit http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf for policy relating to requests for review and appeal of grades.

Mandatory Attendance for First Class Meeting of Each Course

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable reason in advance, you will be removed from the course and the space offered to the next waitlisted student. For more information, please see the "Attendance" section under "Registration Policies and Procedures" (http://camosun.ca/learn/calendar/current/procedures.html) and the Grading Policy at http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf.

Medical / Compassionate Withdrawals

Students who are incapacitated and unable to complete or succeed in their studies by virtue of serious and demonstrated exceptional circumstances may be eligible for a medical/compassionate withdrawal.

Please visit http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.8.pdf to learn more about the process involved in a medical/compassionate withdrawal.

Sexual Violence and Misconduct

Camosun is committed to creating a campus culture of safety, respect, and consent. Camosun's Office of Student Support is responsible for offering support to students impacted by sexual violence. Regardless of when or where the sexual violence or misconduct occurred, students can access support at Camosun. The Office of Student Support will make sure students have a safe and private place to talk and will help them understand what supports are available and their options for next steps. The Office of Student Support respects a student's right to choose what is right for them. For more information see Camosun's Sexualized Violence and Misconduct Policy: http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.9.pdf and camosun.ca/sexual-violence. To contact the Office of Student Support: oss@camosun.ca or by phone: 250-370-3046 or 250-3703841

Student Misconduct (Non-Academic)

Camosun College is committed to building the academic competency of all students, seeks to empower students to become agents of their own learning, and promotes academic belonging for everyone. Camosun also expects that all students to conduct themselves in a manner that contributes to a positive, supportive, and safe learning environment. Please review Camosun College's Student Misconduct Policy at http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.5.pdf to understand the College's expectations of academic integrity and student behavioural conduct.

Changes to this syllabus: Every effort has been made to ensure that information in this syllabus is accurate at the time of publication. The College reserves the right to change courses if it becomes necessary so that course content remains relevant. In such cases, the instructor will give the students clear and timely notice of the changes.

Math 191-X03 Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday
Sept 5-9	**Holiday**	23.1	23.1	23.1	23.2
Sept 12-16	23.3	23.3	23.5	23.4/23.9	23.6
Sept 19-23	23.7	23.7	23.8	23.8	24.1
Sept 26-30	24.2	24.3	24.3	**Test**	**Holiday**
Oct 3-7	24.4	24.4	24.5	24.5	24.7
Oct 10-14	**Holiday**	24.7	24.8	24.8	24.8
Oct 17-21	27.1	27.1	27.2	27.3	27.3
Oct 24-28	27.5	27.5	27.6	**Test**	27.8
Oct 31- Nov 4	25.1	25.2	25.2	25.2	25.3
Nov 7-11	25.4	25.5	25.6	26.1	**Holiday**
Nov 14-18	26.2	26.2	26.3	26.3	26.4
Nov 21-25	26.4	26.6	26.6	**Test**	16.1
Nov 28-Dec 2	16.2	16.2	16.3	16.3	16.4
Dec 5-9	16.5	16.5	16.5	Review	Review

The weekly quiz is at the end of class on Tuesdays, starting in Week 2.

Tentative Test Coverage
Test 1: All of Ch 23
Test 2: All of Ch 24, 27.1, 27.2
Test 3: 27.3, 27.5, 27.6, all of Ch 25, 26.1, 26.2