COURSE SYLLABUS

COURSE TITLE: MATH-166: Applied Math for Electronics 1

CLASS SECTION: X01

TERM: Fall 2023

COURSE CREDITS: 3

DELIVERY METHOD(S): Lecture

INSTRUCTOR DETAILS

NAME: Susie Wieler

EMAIL: wielers@camosun.ca

OFFICE: CBA 147

HOURS: Mondays, Tuesdays and Thursdays 12:00 – 1:00 PM, or by appointment

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

MATH 166 provides the first half of the applied mathematics necessary to achieve competency in electronics and computer engineering technology. Students will first review exponential, logarithmic and trigonometric functions, and then study complex numbers, an introduction to differential calculus of algebraic functions, applications of the derivative, differentiation of transcendental functions, and an introduction to matrix algebra. Applications to electronics 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. Solve problems involving trigonometric functions, and analyze sine and cosine graphs. Solve equations involving exponential and logarithmic functions.
2. Perform basic operations on complex numbers in rectangular form. Represent complex numbers graphically, and in polar (phasor) and exponential form. Compute products, quotients and powers of complex numbers in polar or exponential form.
3. Evaluate limits of functions. Find derivatives of simple functions using the definition. Calculate the derivative of algebraic functions using the product rule, quotient rule and generalized power rule. Use implicit differentiation. Demonstrate an understanding of the derivative as both the slope of a tangent line and an instantaneous rate of change. Use rates of change to solve problems involving applications to electronics.
4. Find the equation of a line tangent and normal to a curve at a point. Use Newton's Method to find an approximate solution to an equation. Solve related rate problems including applications to electronic circuits and devices.
5. Sketch curves using first and second derivatives. Solve optimization problems including applications to electronic circuits and devices. Find differentials, estimate errors, and linearize functions.
6. Differentiate trigonometric, exponential, and logarithmic functions.
7. Use a variety of matrix methods to solve linear systems, including examples with electric circuits and Kirchhoff's laws.

REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

Coursepack available for printing or tablet use.

SHARP EL-W516 scientific calculator. Graphing calculators are not permitted.

myopenmath.com account
  Course ID : 186245
  Enrollment key: homework

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.

WEEK or DATE RANGE	ACTIVITY or TOPIC	OTHER NOTES
Weeks 1-13	MyOpenMath assignments due Sundays at 11:59 pm	
Friday, Sept 22	Test 1 (Chapters 8, 10, 13)	
Tuesday, Oct 17	Test 2 (Chapters 12, 16)	
Tuesday, Nov 7	Test 3 (Chapter 23)	
Friday, Dec 1	Test 4 (Chapters 24, 27)	
Dec 11-19	Exam Period (schedule to be posted Oct 13)	

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 advance notice is required. Deadlines can be reviewed on the CAL exams page. http://camosun.ca/services/accessible-learning/exams.html

TOPICS:
Precalculus Review
       Trigonometric Functions (8.1-8.3)
       Sine and Cosine Graphs (10.3)
       Exponentials and Logarithms (13.1, 13.2, 13.3, 13.6)
Complex Numbers
       Basic Definitions (12.1)
       Basic Operations with Complex Numbers (12.2)
       Graphical Representation of Complex Numbers (12.3)
       Polar Form of a Complex Number (12.4)
       Exponential Form of a Complex Number (12.5)
       Products, Quotients, and Powers of Complex Numbers (12.6)
Matrices; Systems of Linear Equations
       Definitions and Basic Operations (16.1)
       Multiplication of Matrices (16.2)
       Gaussian Elimination (16.5)
       Determinants and Cramer's rule (16.6)
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)

Applications of the Derivatives
        Tangents and Normals (24.1)
        Newton's Method (24.2)
        Related Rates (24.4)
        Using Derivatives in Curve Sketching (24.5)
        Applied Maximum and Minimum Problems (24.7)
Differentiation of Transcendental Functions
        Derivatives of the Sine and Cosine Functions (27.1)
        Derivatives of the Other Trigonometric Functions (27.2)
        Derivatives of the Logarithmic Function (27.5)
        Derivatives of the Exponential Function (27.6)

EVALUATION OF LEARNING

DESCRIPTION	WEIGHTING
Assignments (13)	10%
Tests (weighted 20%, 15%, 10%, 5% from highest to lowest marks)	50%
Final Exam	40%
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

Policy regarding missed tests:

- If a student misses one (1) test for any reason, their final exam mark will also be used as their mark on the missed test.
- If a student has already missed one test and needs to miss another test, the student is required to contact me before the test. Documentation to verify the reason for the absence may be requested, and alternate arrangements will be made on a case-by-case basis. Students who fail to contact me will receive a mark of zero (0) on the missed test(s).

COURSE GUIDELINES & EXPECTATIONS

The following content is available on D2L:
- Lecture notes will be posted shortly after each class.
- Scans of the Problem Sets from the following textbook are available for extra practice, along with answers and step-by-step solutions: *Basic Technical Mathematics, With Calculus, SI Version, Tenth Edition* by A. Washington and M. Boue.
- Practice Questions for each test, along with their step-by-step solutions.
- Test solutions will be posted shortly after each test.

SCHOOL OR DEPARTMENTAL INFORMATION

Interurban Math Lab
    Services: Individual tutoring and study space
    Location: TEC 142
    Schedule: posted on the door
    Format: Drop in - first-come, first-served

Chair of the Math & Stats Department: Patrick Montgomery
    Phone: 250-370-3502
    Office: Ewing 268, Lansdowne Campus
    Email: montgomeryp@camosun.ca

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.

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.

COLLEGE-WIDE POLICIES, PROCEDURES, REQUIREMENTS, AND STANDARDS

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.