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

MATH-166-DX01
Applied Math for Electronics 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.*

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1. Instructor Information

(a) Instructor	Susie Wieler		
(b) Office hours	Wednesdays 1:30-2:30		
(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. 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.
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.

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-W516XG** is strongly recommended.

4. Course Content and Schedule

Review
- · Review of Basic Trigonometric Functions (sections 8.1-8.3)
- · Review of Sine and Cosine Graphs (sections 10.1-10.3)
- · Review of Exponentials and Logarithms (sections 13.1-13.6)

Complex Numbers
- · Basic Definitions (section 12.1)
- · Basic Operations with Complex Numbers (section 12.2)
- · Graphical Representation of Complex Numbers (section 12.3)
- · Polar Form of a Complex Number (section 12.4)
- · Exponential Form of a Complex Number (section 12.5)
- · Products, Quotients, and Powers of Complex Numbers (section 12.6)

Matrices; Systems of Linear Equations
- · Definitions and Basic Operations (section 16.1)
- · Multiplication of Matrices (section 16.2)
- · Gaussian Elimination (section 16.5)
- · Determinants and Cramer's rule (section 16.6)

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

Applications of the Derivatives
- · Tangents and Normals (section 24.1)
- · Newton's Method (section 24.2)
- · Related Rates (section 24.4)
- · Using Derivatives in Curve Sketching (section 24.5)
- · Applied Maximum and Minimum Problems (section 24.7)

Differentiation of Transcendental Functions
- · Derivatives of the Sine and Cosine Functions (section 27.1)
- · Derivatives of the Other Trigonometric Functions (section 27.2)
- · Derivatives of the Logarithmic Function (section 27.5)
- · Derivatives of the Exponential Function (section 27.6)

5. Basis of Student Assessment (Weighting)

- Weekly assignments 25%
- Biweekly tests 75%

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

[x] 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	*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.