CAMOSUN	**School of Arts & Science** **Department of Mathematics & Statistics** **MATH 166** **Applied Math for Electronics 1** **Fall 2017**

COURSE OUTLINE

The course description is online @ http://camosun.ca/learn/calendar/current/web/math.html

Ω *Please note: the College electronically stores this outline for five (5) years only.*
*It is **strongly recommended** you keep a copy of this outline with your academic records.*
You will need this outline for any future application/s for transfer credit/s to other colleges/universities.

1. Instructor Information

(a)	Instructor:	Susie Wieler		
(b)	Office Hours:	*TBA*		
(c)	Location:	CBA 147		
(d)	Phone:	250-370-4448	Alternative Phone:	
(e)	Email:	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. 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.

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

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)

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)
- · Differentials and Linear Approximations (section 24.8)

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)

Matrices; Systems of Linear Equations
- · Definitions and Basic Operations (section 16.1)
- · Multiplication of Matrices (section 16.2)
- · Finding the Inverse of a Matrix (section 16.3)
- · Matrices and Linear Equations (section 16.4)
- · Determinants and Cramer's rule (section 16.6)

5. Basis of Student Assessment (Weighting)

- Term Work (Quizzes and Tests): 50%
- Comprehensive Final Exam: 50%

If a student's final exam grade is higher than his/her term grade AND the term work is complete and 50% or higher, then the final exam grade will count as 100% of the overall course grade.

Tentative Test Dates:

September 29 October 20 November 10 December 1

Quizzes: A short quiz will be given at the beginning of class on Wednesdays. The two lowest quiz grades will be dropped. There are no make-up quizzes, even if a student is absent.

6. Grading System

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	Minimum level of achievement for which credit is granted; a course with a "D" grade cannot be used as a prerequisite.	1
0-49	F	Minimum level has not been achieved.	0

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 E-1.5 at **camosun.ca** 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, due to design may require a further enrollment in the same course. No more than two IP grades will be assigned for the same course. *(For these courses a final grade will be assigned to either the 3rd course attempt or at the point of course completion.)*
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 or Services to Assist Students to Succeed Throughout the Course

LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College calendar, at Student Services, or the College web site at camosun.ca.

STUDENT CONDUCT POLICY

There is a Student Conduct Policy **which includes plagiarism**.
It is the student's responsibility to become familiar with the content of this policy.
The policy is available in each School Administration Office, at Student Services, and the College web site in the Policy Section.

The final exam will cover the entire course and will be 3 hours long. As stated in the current college calendar, "students are expected to write tests and final examinations at the scheduled time and place." Exceptions will only be considered due to **emergency** circumstances as outlined in the calendar. Holidays or scheduled flights are not considered to be emergencies.

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.