

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:	Wednesdays and Fridays 12:30 – 1:30
(c)	Location:	CBA 147
(d)	Phone:	250-370-4448
(e)	Email:	wielers@camosun.bc.ca
(f)	Website:	https://sites.google.com/site/susiewieler

Additional support is available in the **Math Lab** TEC 142 Monday – Thursday 12:00 – 4:30 pm

2. Intended Learning Outcomes

Upon completion of this course the student will be able to:

1. Read and write mathematics at a level sufficient for entry into applied calculus.
2. Factor polynomials. Simplify rational expressions, complex fractions and radicals. Factor and simplify expressions containing rational exponents.
3. Choose efficient strategies to solve quadratic equations. Solve radical equations and equations involving rational expressions.
4. State the formulas for the slope y-intercept and point slope form of lines and use the formulas to find equations of lines. Graph linear equations and find equations from graphs. Model real-life problems with linear equations.
5. Write the equations of circles and ellipses in standard form and graph these relations.
6. Define the term function. Determine if relations are functions. Find the domains of functions. Define even and odd functions and test functions to determine if they are even, odd or neither. Form and simplify difference quotients and explain their graphical interpretation and significance.
7. Identify the graphs of common algebraic functions. Evaluate and graph piecewise defined functions.
8. Construct algebraic functions to model simple real-life problems.
9. Translate verbal descriptions of transformations to function notation and vice versa. Interpret and graph multiple transformations of functions.
10. Analyze and graph quadratic functions. Solve optimization problems modelled with quadratic functions.
11. Graph polynomial functions using symmetry, end behaviour and behaviour near their x-intercepts. Analyze graphs of polynomial functions and construct possible equations.
12. Determine the domain, intercepts and the equations of horizontal and vertical asymptotes for rational functions.
13. Solve polynomial and rational inequalities.
14. State the Remainder, Factor and Rational Zeros Theorems and use these theorems to factor polynomials and find the real zeros.
15. Compose and decompose functions. Verify that two functions are inverses using the definition of inverse functions. Find inverse functions algebraically and graphically.
16. Explain the relationship between exponential and logarithmic functions. Graph exponential and logarithmic functions and their transformations.
17. Use the properties of logarithms to simplify expressions and solve equations.
18. Solve applied problems involving pH, the Richter scale, decibels, compound interest, exponential growth, exponential decay and logistic growth.
19. Convert between degree and radian measure.

20. Sketch graphs of the sine and cosine functions using their unit circle definitions. Graph transformations of these functions.
21. Define the tangent, cotangent, secant and cosecant functions in terms of the sine and cosine functions. Graph the tangent, cotangent, secant and cosecant functions using the sine and cosine graphs.
22. State the right triangle definitions for the trigonometric functions. Use reference triangles to find exact values of trigonometric functions.
23. Derive the Pythagorean identities and the double angle identities. Use the Pythagorean identities, the sum and difference identities and the double angle identities to simplify expressions and verify other identities.
24. Find exact values for compositions of trigonometric and inverse trigonometric functions.
25. Find exact and approximate solutions of basic trigonometric equations.
26. Identify patterns in sequences and write formulas for the general terms. Write the terms of recursively defined sequences. Express sums using summation notation.
27. Identify arithmetic and geometric sequences and derive formulas for their n th terms. Find the sums of the first n terms of these sequences. Solve word problems involving arithmetic and geometric sequences and series.

3. Required Materials

Textbook: *Algebra & Trigonometry* by Michael Sullivan, Tenth Edition

Calculator: As per department policy, the only calculator permitted for use on tests and the final exam is the **Sharp EL-531** (or EL-510R) scientific calculator.

4. Course Content and Schedule

Chapter R Review

- R.5 Factoring Polynomials
- R.6 Synthetic Division
- R.7 Rational Expressions
- R.8 n th Roots; Rational Exponents

Chapter 1 Equations and Inequalities

- 1.1 Linear Equations
- 1.2 Quadratic Equations
- 1.4 Radical Equations; Equations Quadratic in Form; Factorable Equations
- 1.5 Solving Inequalities

Chapter 2 Graphs

- 2.1 The Distance and Midpoint Formulas
- 2.2 Graphs of Equations in Two Variables; Intercepts; Symmetry
- 2.3 Lines
- 2.4 Circles

Chapter 11 Analytic Geometry

- 11.3 The Ellipse

Chapter 3 Functions and Their Graphs

- 3.1 Functions
- 3.2 The Graph of a Function
- 3.3 Properties of Functions
- 3.4 Library of Functions; Piecewise-defined Functions
- 3.5 Graphing Techniques: Transformations
- 3.6 Mathematical Models: Building Functions

Chapter 4 Linear and Quadratic Functions

- 4.1 Properties of Linear Functions and Linear Models
- 4.3 Quadratic Functions and Their Properties
- 4.4 Build Quadratic Models from Verbal Descriptions and from Data
- 4.5 Inequalities Involving Quadratic Functions

Chapter 5 Polynomial and Rational Functions

- 5.1 Polynomial Functions and Models
- 5.2 Properties of Rational Functions
- 5.3 The Graph of a Rational Function
- 5.4 Polynomial and Rational Inequalities
- 5.5 The Real Zeros of a Polynomial Function

Chapter 6 Exponential and Logarithmic Functions

- 6.1 Composite Functions
- 6.2 One-to-One Functions; Inverse Functions
- 6.3 Exponential Functions
- 6.4 Logarithmic Functions
- 6.5 Properties of Logarithms
- 6.6 Logarithmic and Exponential Equations

- 6.7 Financial Models
- 6.8 Exponential Growth and Decay Models; Newton's Law; Logistic Growth and Decay Models
- Chapter 7 Trigonometric Functions
 - 7.1 Angles and Their Measure
 - 7.2 Right Triangle Trigonometry
 - 7.3 Computing the Values of Trigonometric Functions of Acute Angles
 - 7.4 Trigonometric Functions of Any Angle
 - 7.5 Unit Circle Approach; Properties of the Trigonometric Functions
 - 7.6 Graphs of the Sine and Cosine Functions
 - 7.7 Graphs of the Tangent, Cotangent, Cosecant, and Secant Functions
 - 7.8 Phase Shift; Sinusoidal Curve Fitting
- Chapter 8 Analytic Trigonometry
 - 8.1 The Inverse Sine, Cosine, and Tangent Functions
 - 8.2 The Inverse Trigonometric Functions (Continued)
 - 8.3 Trigonometric Equations
 - 8.4 Trigonometric Identities
 - 8.5 Sum and Difference Formulas
 - 8.6 Double-angle and Half-angle Formulas
- Chapter 13 Sequences; Induction; the Binomial Theorem
 - 13.1 Sequences
 - 13.2 Arithmetic Sequences
 - 13.3 Geometric Sequences; Geometric Series

5. Basis of Student Assessment (Weighting)

Quizzes: 5%

A short quiz will be given at the beginning of class on **Tuesdays**. The two lowest quiz grades will be dropped.

Tests: 45%

Tentative Test Dates: February 10 March 10 April 7

Final Exam: 50%

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.

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	<i>Incomplete:</i> 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	<i>In progress:</i> 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. <i>(For these courses a final grade will be assigned to either the 3rd course attempt or at the point of course completion.)</i>
CW	<i>Compulsory Withdrawal:</i> 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 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.