



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:	Dr. Michelle Edwards
(b)	Office Hours:	Monday/Tuesday/Wednesday 2:30pm-3:30pm, Friday 10:30am-12:30pm
(c)	Location:	Ewing 246
(d)	Phone:	250-370-3471
(e)	Email:	medwards@camosun.bc.ca
(f)	Website:	D2L

Additional support is available in the **Math Lab** Ewing 224 Monday–Friday 9am–4:30pm.

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 first-year calculus.
2. Write equations of circles and ellipses in standard form and graph these relations. Expand binomials using Pascal's triangle. Factor and simplify expressions with rational exponents. Solve polynomial and rational inequalities. State the Remainder, Factor and Rational Zeros Theorems and use these theorems to factor polynomials and find their real zeros.
3. Define the term function. Find the domain of functions. Compose and decompose functions. Construct algebraic functions to model simple real-life problems. Solve optimization problems modelled with quadratic functions.
4. Identify the graphs of common algebraic functions. Evaluate and graph piecewise defined functions. Interpret and graph multiple transformations of functions. Analyze and graph polynomial and rational functions.
5. Find inverse functions algebraically and graphically. Explain the relationship between exponential and logarithmic functions. Graph exponential and logarithmic functions and their transformations. Prove the properties of logarithms and use these properties to simplify expressions and solve equations. Solve applied problems involving pH, the Richter scale, decibels, compound interest, exponential growth, exponential decay and logistic growth.
6. State the right triangle definitions for the trigonometric functions. Use reference triangles to find exact values of trigonometric functions of special angles. Define a radian and work with radian measure. State the unit circle definitions for the sine and cosine functions. Graph the six trigonometric functions and transformations of these functions. Analyze sinusoidal graphs and construct possible equations. Graph the inverse sine, cosine and tangent functions. Find exact values for compositions of trigonometric and inverse trigonometric functions. Write compositions as algebraic expressions.
7. Derive the Pythagorean identities, the sum and difference identities, the double angle identities, the power reducing identities, and the half angle identities. Use these identities to simplify expressions and verify other identities. Find exact and approximate solutions of trigonometric equations, including equations involving identities and multiples of angles.
8. Identify patterns in sequences and write formulas for the general terms. Simplify and evaluate basic sums of sequences. Derive formulas for the n th terms of arithmetic and geometric sequences and for the sums of the first n terms of these sequences. Solve word problems involving arithmetic and geometric sequences and series.
9. Evaluate limits graphically, numerically and algebraically. Use the definition of a derivative to differentiate basic polynomial, rational and radical functions. Differentiate polynomials using standard rules. Demonstrate an understanding of both the geometrical and physical interpretations of derivatives.

3. Required Materials

(a) **Text:** *Algebra and Trigonometry*, Sullivan, 10th edition.

(b) **Calculus supplement:** See website.

(c) **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. No other electronic devices are permitted, such as cell phones, smart watches, electronic translators, etc.

4. Course Content and Schedule

Chapter R: Algebra Reference – for review

Chapter 1: Equations and Inequalities

1.1 Linear Equations

1.2 Quadratic Equations

1.4 Radical Equations; Equations in Quadratic 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

11.4 The Hyperbola

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 Equations

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 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
 - 13.1 Sequences
 - 13.2 Arithmetic Sequences
 - 13.3 Geometric Sequences; Geometric Series
- Calculus Supplement
 - Calc 1.1 Introduction
 - Calc 1.2 Secant and Tangent Lines
 - Calc 1.3 Limits
 - Calc 1.4 The Derivative
 - Calc 1.5 Applications of Derivatives

5. Basis of Student Assessment (Weighting)

In Class Assignments: 6%

Starting in the second week of class, there will be a weekly in class assignment at the half-way point of lecture every **Thursday** (that is a non-midterm Thursday). The two lowest in class assignment marks will be dropped from your final course grade. There will be no make-up assignments, even if a student is absent.

Take Home Assignments: 14%

There will be some take home assignments due periodically throughout the semester. All take home assignment marks will be included in your final grade. There will be no make-up assignments. Assignments will not be accepted after the solution key has been posted. (i.e. Late assignments will not be accepted for marks!)

Midterm Tests: 30% (10% each)

Midterm Test Dates: Thursday February 2nd, Thursday March 9th, Thursday April 6th

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. A copy of this document has been posted on the course D2L page.