



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:	Nick Marsden		
(b)	Office Hours:	Mon, Tue, Thu, Fri 10:30 to 11:30 + usually also daily 11:30-2:30		
(c)	Location:	Ewing 258		
(d)	Phone:	250-370-3499	Alternative Phone:	
(e)	Email:	nmarsden@camosun.ca		
(f)	Website:			

2. Intended Learning Outcomes

(No changes are to be made to these Intended Learning Outcomes as approved by the Education Council of Camosun College.)

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. Factor polynomials. Simplify rational expressions, complex fractions and radicals. Factor and simplify expressions with rational exponents.
3. Derive the quadratic formula. Choose efficient strategies to solve quadratic equations. Solve radical equations and equations involving rational expressions. Solve equations and inequalities involving absolute value. Solve problems involving direct, inverse and joint variation.
4. State the formulas for the slope – intercept and point – slope form of lines and use these formulas to find equations of lines. Graph linear equations and find equations from graphs. Model real-life problems with linear equations.
5. Recognize the equations of circles, ellipses, hyperbolas and parabolas. Write the equations of circles, ellipses and hyperbolas in standard form and graph these relations. Find the vertices of hyperbolas and ellipses. Find the equations of the asymptotes for hyperbolas. Solve linear and nonlinear systems of equations graphically and algebraically.
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 end behaviour and behaviour near their x-intercepts. Analyze graphs of polynomial functions and construct possible equations.
12. Graph rational functions using symmetry, asymptotes, behaviour near their x-intercepts and tables of signs. Analyze graphs of rational functions and construct possible equations.
13. Solve polynomial and rational inequalities.
14. State the Remainder, Factor and Rational Zeros Theorems and use these theorems to factor polynomials and find their real zeros.
15. Compose and decompose functions. State the definition of an inverse function. Verify that two functions are inverses using the definition. Find inverse functions algebraically and graphically.
16. Explain the relationship between exponential and logarithmic functions. Graph exponential and logarithmic functions and their transformations.

17. Prove the properties of logarithms and use these properties 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. Define a radian and work with radian measure. Convert between degree and radian measure.
20. State the unit circle definitions for the sine and cosine functions. Using the definitions, deduce properties of the sine and cosine functions and sketch their graphs. Graph transformations of these functions. Analyze sinusoidal graphs and construct possible equations. Model cyclical patterns, including temperature variation and height of tides.
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. Solve applied problems involving right triangles.
23. 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.
24. Graph the inverse sine, cosine and tangent functions. Find exact values for compositions of trigonometric and inverse trigonometric functions. Write compositions as algebraic expressions.
25. Find exact and approximate solutions of trigonometric equations, including equations involving identities and multiples of angles.
26. Identify patterns in sequences and write formulas for the general terms. Write the terms of recursively defined sequences. Express sums using summation notation. Simplify and evaluate basic sums of sequences.
27. Identify geometric sequences and series. 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.
28. Expand binomials using Pascal's triangle.

3. Required Materials

- (a) Texts: Sullivan, M. Algebra & Trigonometry, 8th edition
- (b) Other

4. Course Content and Schedule

(This section can include: class hours, lab hours, out of class requirements and/or dates for quizzes, exams, lectures, labs, seminars, practicums, etc.)

CHAPTER R: Review

#	Text	Time	
1	R.4	2	Polynomials; Pascal's triangle
2	R.5	2	Factoring Polynomials
3	R.7	2.5	Rational Expressions
4	R.8	2.5	n th Roots; Rational Exponents
			TAKE-HOME TEST
		2	TEST 1, Lessons 1 to 4

CHAPTER 1: Equations and Inequalities

#	Text	Time	
5	1.2	2	Quadratic Equations
6	1.4	2	Radical Equations; Equations Quadratic in Form; Factorable Equations
7	1.5, 1.6	2	Solving Inequalities
			TAKE-HOME TEST

CHAPTER 2: Graphs

#	Text	Time	
8	2.1	1	The Distance and Midpoint Formulas
9	2.2	1	Graphs of Equations in Two Variables; Intercepts; Symmetry
10	2.3	1	Lines
11	2.4	1	Circles
12	Notes	2	Systems of Equations
			TAKE-HOME TEST
		1	TEST 2, Lessons 5 to 12

CHAPTER 3: Functions and Their Graphs

#	Text	Time	
13	3.1	1	Functions
14	3.2	1	The Graph of a Function
15	3.3	1	Properties of a Function
16	3.4	2	Library of Functions; Piecewise-defined Functions
17	3.5	3	Graphing Techniques: Transformations; Conics

CHAPTER 4: Linear and Quadratic Functions

#	Text	Time	
18	4.3	1	Quadratic Functions and Their Properties
19	4.4	1	Quadratic Models TAKE-HOME TEST

CHAPTER 5: Polynomial and Rational Functions

#	Text	Time	
20	5.1	1	Polynomial Functions of Higher Degree
21	5.2	1	Properties of Rational Functions
22	5.3	1	The Graph of a Rational Function
23	5.4	1	Polynomial and Rational Inequalities
24	5.5	2	The Real Zeros of a Polynomial Function TAKE-HOME TEST
		1	TEST 3, Lessons 13 to 24

CHAPTER 6: Exponential and Logarithmic Functions

#	Text	Time	
25	6.1	1	Composite Functions
26	6.2	1	One-to-One Functions; Inverse Functions
27	6.3	1	Exponential Functions
28	6.4	2	Logarithmic Functions
29	6.5	2	Properties of Logarithms
30	6.6	1	Logarithmic and Exponential Equations
31	6.7	1	Compound Interest TAKE-HOME TEST
32	6.8	2	Exponential Growth and Decay
		1	TEST 4, Lessons 25 to 32

CHAPTER 7: Trigonometric Functions

#	Text	Time	
33	7.1	1	Angles and Their Measure
34	7.2	1	Right Triangle Trigonometry
35	7.4	2	Trigonometric Functions: the Unit Circle Approach
36	7.6, 7.8	2	Graphs of the Sine and Cosine Functions; Sinusoidal Curve Fitting
37	7.7	1	Graphs of the Other Four Trigonometric Functions TAKE-HOME TEST

CHAPTER 8: Analytic Trigonometry

#	Text	Time	
38	8.1, 8.2	2	The Inverse Sine, Cosine and Tangent Functions
39	8.3	2	Trigonometric Identities
		1	TEST 5, Lessons 33 to 39

40	8.4	2	Sum and Difference Formulas
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41	8.5	2	Double-angle and Half-angle Formulas
42	8.7, 8.8	2	Trigonometric Equations
			TAKE-HOME TEST
		1	TEST 6, Lessons 33 to 42

CHAPTER 13: Sequences and Series

#	Text	Time	
43	13.1	1	Sequences
44	13.2	1	Arithmetic Sequences
45	13.3	1	Geometric Sequences
		1	TEST 7, Lessons 43 to 45

INTRODUCTION TO CALCULUS

#	Text	Time	
C1	Notes	1	Limits
C2	Notes	1	The Secant line; Average Velocity
C3	Notes	1	The Tangent line; Instantaneous Velocity
C4	Notes	1	The Derivative Function
C5	Notes	2	Differentiation Rules for Polynomials; Instantaneous Velocity
C6	Notes	1	Graphing Polynomial Functions
C7	Notes	1	Max/Min Problems
		1	TEST 8, Lessons 46 to C7

Review: 4 hours

Final exam

5. Basis of Student Assessment (Weighting)

(This section should be directly linked to the Intended Learning Outcomes.)

(a)	Other (eg, Attendance, Project, Group Work)	See below
(b)	Assignments	See below
(c)	Term tests	50%. Will throw out worse test if class participation and assignments are satisfactory
(d)	Final exam	50%. or 100% if higher than term mark

1. TERM MARK. You will be doing a number of take-home tests. These can be done in consultation with other students in your class, but with the help of nobody else. They will be overdue if not handed in at the beginning of the class on the due date, but can be handed in up to one day late with only a one mark deduction.

The term mark is the average of the scores on your in-class tests. However, if the average of your take-home test scores is at least 70% AND your in-class participation is satisfactory, I will throw out your worst test before I calculate the average.

If you miss an in-class test for ANY reason, you will get a zero. There will be no make-ups. But with decent take-home test scores and class participation, that zero will be tossed out.

2. FINAL EXAM. The final exam for this course is to be written by all students on the day and time scheduled.

3. MARK FOR THE COURSE. Your course mark is the larger of:

- a) The average of your term percentage and your final exam percentage
- b) Your final exam percentage

The Math Department reserves the right to raise your course mark if it is judged that your in-class tests and final exam were more difficult than those in other years or other sections.

6. Grading System

(No changes are to be made to this section unless the Approved Course Description has been forwarded through the Education Council of Camosun College for approval.)

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.

ADDITIONAL COMMENTS AS APPROPRIATE OR AS REQUIRED