

# COURSE SYLLABUS



**COURSE TITLE:** MATH-097: College Preparatory - Mathematics 2

**CLASS SECTION:** 002

**TERM:** Winter 2023

**COURSE CREDITS:** 3

**DELIVERY METHOD(S):** Face-to-face

Camosun College campuses are located on the traditional territories of the Lək̓ʷəŋən and W̱SÁNEĆ peoples. We acknowledge their welcome and graciousness to the students who seek knowledge here.

Learn more about Camosun's [Territorial Acknowledgement](#).

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For COVID-19 information please visit <https://legacy.camosun.ca/covid19/index.html>.

*Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable explanation in advance, you will be removed from the course and the space offered to the next waitlisted student.*

## INSTRUCTOR DETAILS

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**NAME:** Chedo Barone

**EMAIL:** [baronec@camosun.ca](mailto:baronec@camosun.ca)

**OFFICE:** Ewing 266

**HOURS:** Monday and Wednesday 12:30 – 2:20, Thursday 3:30-4:20 or by appointment

*As your course instructor, I endeavour to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me. Camosun College is committed to identifying and removing institutional and social barriers that prevent access and impede success.*

## CALENDAR DESCRIPTION

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Students will build the knowledge and skills in algebra and trigonometry necessary for entry into technical, vocational and career programs that require Math 12 equivalency as a prerequisite and for future study in higher-level math courses at college/university. Students will improve their knowledge of functions and graphs, expanding knowledge of exponential and trigonometric functions to enable analysis of applied problems.

### PREREQUISITE(S):

One of:

C in Pre-calculus 11; C in MATH 073; C in MATH 077; C in MATH 137; C in MATH 139

### CO-REQUISITE(S):

Not Applicable

### EXCLUSION(S):

Not Applicable

## COURSE LEARNING OUTCOMES / OBJECTIVES

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The learning outcomes in this course meet the required learning outcomes in ABE Mathematics: Provincial Algebra and Trigonometry outlined in the BC ABE Articulation Handbook 2018/19 Edition.

Upon successful completion of this course a student will be able to:

1. Employ advanced graphing techniques for relations and functions, including discontinuous applications. In particular, students will be able to:

- a. Find the distance between two points in the plane and find the midpoint of a segment,
- b. Apply the distance formula and midpoint formula to solve problems,
- c. Recognize graphs of common functions: linear, constant, quadratic, cubic, square root, absolute value, reciprocal,
- d. Use the vertical line test to identify functions,
- e. Graph functions and analyze graphs of functions, identifying: domain and range; intervals on which the function is increasing, decreasing or constant,
- f. Write formulas of functions to model real life applications,
- g. Determine whether a graph is symmetric with respect to the x-axis, y-axis, and the origin,
- h. Identify even or odd functions and recognize their symmetries,
- i. Graph transformations of functions: translations, reflections, stretchings and shrinkings,
- j. Graph functions defined piecewise,
- k. Find the sum, difference, product and quotient of two functions and determine their domains,
- l. Find the composition of two functions  $f$  and  $g$ , finding formulas for  $f(g(x))$  and  $g(f(x))$ , identifying the domain of the composition and evaluating the composite function,
- m. Given an equation defining a relation, write an equation of the inverse relation,
- n. Given a graph of a relation or function, sketch a graph of its inverse,
- o. Use the horizontal line test to determine if a function is one-to-one and therefore has an inverse that is a function,
- p. Find a formula for the inverse of a function, and
- q. Find  $f^{-1}(f(x))$  and  $f(f^{-1}(x))$  for an number  $x$  in the domains of the functions when the inverse of a function is also a function.

2. Apply the algebraic and visual properties of polynomial and rational functions to modelling of continuous and discontinuous phenomena. In particular, students will be able to:

- a. Graph quadratic functions and analyze graphs of quadratic functions identifying the vertex, line of symmetry, maximum/minimum values, and intercepts,
- b. Solve applied problems involving maximum and minimum function values,
- c. Determine the behavior of the graphs of polynomial functions of higher degree using the leading coefficient test,
- d. Determine whether a function has a real zero between two real numbers,
- e. Recognize characteristics of the graphs of polynomial functions including real zeros, y-intercept, relative maxima and minima, domain and range,
- f. Divide polynomials using long division,
- g. Use synthetic division to divide a polynomial by  $x-r$ ,

- h. Use the remainder and factor theorems to find function values and factors of a polynomial,
- i. List the possible rational zeros for a polynomial function with integer coefficients,
- j. Factor polynomial functions and find the zeros,
- k. Find a polynomial with specified zeros, and
- l. Solve polynomial and rational inequalities.

3. Apply the fundamental algebraic and visual properties of exponential and logarithmic functions to simple examples. In particular, students will be able to:

- a. Evaluate exponential functions including functions with base  $e$ ,
- b. Recognize the inverse relationship between exponential and logarithmic functions,
- c. Graph exponential and logarithmic functions including transformations and analyze the graphs in terms of:  $x$ - or  $y$ - intercepts, asymptotes, increasing or decreasing, domain and range,
- d. Convert between exponential and logarithmic equations
- e. Find common and natural logarithms using a calculator
- f. Use basic and inverse properties of logarithms:  $\log_b b = 1$ ,  $\log_b 1 = 0$ ,  $\log_b b^x = x$ ,  $b^{\log_b x} = x$ ,
- g. Use the product rule, quotient rule and power rule to expand or condense logarithmic expressions,
- h. Use the change of base property to find a logarithm with base other than 10 or  $e$ ,
- i. Solve exponential and logarithmic equations, and
- j. Use exponential and logarithmic equations to model and solve real-life applications including exponential growth and decay.

4. Apply the fundamental algebraic and visual properties of trigonometric functions to simple examples of periodic phenomena. In particular, students will be able to:

- a. Identify angles in standard position, positive and negative angles, coterminal angles and reference angles,
- b. Convert between degree and radian measures of angles,
- c. Find the length of an arc, radian measure of central angle, or radius of a circle using the formula  $s=r\theta$ ,
- d. Identify special angles on a unit circle,
- e. Determine the six trigonometric functions of an angle in standard position given a point on its terminal side,
- f. Find the exact values of the trigonometric functions of special acute angles  $30^\circ$  ( $\pi/6$ ),  $45^\circ$  ( $\pi/4$ ), and  $60^\circ$  ( $\pi/3$ ) or any angles that are multiples of these special angles,
- g. Graph the six trigonometric functions and state their properties,
- h. Graph transformations of the sine and cosine functions and determine period, amplitude, and phase shift,
- i. Recognize and use the reciprocal, quotient and Pythagorean identities,
- j. Apply the sum or difference formulas and double angle formulas to find exact values and to verify trigonometric identities,
- k. Recognize and use inverse trigonometric function notation,
- l. Use a calculator to evaluate inverse trigonometric functions,
- m. Find exact values of composite functions with inverse trigonometric functions,
- n. Solve trigonometric equations over the interval  $(0, 2\pi)$ , and
- o. Use trigonometric functions to model and solve real-life problems.

5. Apply the fundamental algebraic properties of sequences and series to describe geometric growth patterns.

In particular, students will be able to:

- a. Find terms of sequences given the general or  $n$ th term,
- b. Find a formula for the general or  $n$ th term of a given sequence,

- c. Use summation notation to write a series and evaluate a series designated in summation notation,
- d. Construct the terms of a sequence defined by a recursive formula,
- e. Recognize and write terms of arithmetic and geometric sequences,
- f. Use  $n$ th term formulas for arithmetic and geometric sequences to find a specified term, or to find  $n$  when an  $n$ th term is given,
- g. Find the sum of the first  $n$  terms of arithmetic and geometric sequences,
- h. Find the sum of an infinite geometric series, if it exists, and
- i. Use sequences and series to model and solve real-life problems.

## REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

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### Texts/Notes:

Algebra and Trigonometry, Jay Abramson (senior author), OpenStax: Texas. The textbook can be downloaded at this link: <https://openstax.org/details/books/algebra-and-trigonometry>

Course Notes will be posted on the course D2L page.

### Other:

A Sharp-EL 531 calculator (any of the EL-531 models are acceptable, for example EL-531X, EL-531XT, EL-531XBGR).

## COURSE SCHEDULE, TOPICS, AND ASSOCIATED PREPARATION / ACTIVITY / EVALUATION

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The following schedule and course components are subject to change with reasonable advance notice, as deemed appropriate by the instructor.

**Class times and locations:** Monday, Tuesday, and Wednesday from 2:30PM to 3:20PM in Young 317. Thursdays from 2:30PM to 4:20PM in Fisher 202.

**Content:** We will cover Chapters 1,2,3,5,6,7,8,9, and 13 of the textbook.

**Tests:** There will be four term tests, each with a writing time of 50 minutes. The coverage for each test will be announced during the previous week's class and will also be posted on D2L. The tests will all be written during the second half of our Thursday classes on the following dates:

- Thursday January 26 (Week 3)
- Thursday February 16 (Week 6)
- Thursday March 16 (Week 10)
- Thursday April 6 (Week 13)

**WeBWork Online Practice Assignments:** Every week, a selection of practice problems will be assigned through the WeBWork platform, due to be completed by the following week. The link to our WeBWork page can be found on our D2L page. You will be allowed to attempt the assignment questions as many times as you would like. Each assignment will remain open after its due date for *half of the original marks*, until the day of the final exam. You can find the link to WeBWork on our D2L page.

**Final Exam:** There will be a comprehensive three-hour final exam scheduled during the Final Exam Period (April 17 to 25).

**Class cancellations:** There will be no classes during Week 7 (February 20 to 24). The College will also be closed, and there will be no classes on February 20 (Family Day), February 24 (College Conversations Day), April 7 (Good Friday), and April 10 (Easter Monday).

Students registered with the Centre for Accessible Learning (CAL) who complete quizzes, tests, and exams with academic accommodations have booking procedures and deadlines with CAL where advanced notice is required. Deadlines can be reviewed on the [CAL exams page](http://camosun.ca/services/accessible-learning/exams.html). <http://camosun.ca/services/accessible-learning/exams.html>

## EVALUATION OF LEARNING

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DESCRIPTION	WEIGHTING
WeBWork Online Practice Assignments (weekly)	8%
Test 1 (January 26)	10%
Test 2 (February 16)	14%
Test 3 (March 16)	14%
Test 4 (April 6)	14%
Final Exam (Date to be announced)	40%
	<b>TOTAL</b>
	100%

If you have a concern about a grade you have received for an evaluation, please come and see me as soon as possible. Refer to the [Grade Review and Appeals](http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf) policy for more information. <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf>

## COURSE GUIDELINES & EXPECTATIONS

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Your success in this course will depend heavily on your commitment to **regularly** working on practice problems. For each week of the course, you should expect to spend between 7 and 12 hours a week working on practice problems.

Being able to “do math” is a skill, and like any skill, it needs regular practice to flourish. As the gap between a student’s practice sessions increases, the amount of practice time needed in order to make progress will also increase. For maximum efficiency with your learning, you should aim to practice, even just a little bit, every day.

## SCHOOL OR DEPARTMENTAL INFORMATION

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## Math Lab (Help Centre)

The Math Labs are staffed with instructional assistants available for **free** help. Hours of operation and other details can be viewed at <https://camosun.ca/services/academic-supports/help-centres/math-help>

## STUDENT RESPONSIBILITY

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Enrolment at Camosun assumes that the student will become a responsible member of the College community. As such, each student will display a positive work ethic, assist in the preservation of College property, and assume responsibility for their education by researching academic requirements and policies; demonstrating courtesy and respect toward others; and respecting expectations concerning attendance, assignments, deadlines, and appointments.

## SUPPORTS AND SERVICES FOR STUDENTS

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Camosun College offers a number of services to help you succeed in and out of the classroom. For a detailed overview of the supports and services visit <http://camosun.ca/students/>.

Academic Advising	<a href="http://camosun.ca/advising">http://camosun.ca/advising</a>
Accessible Learning	<a href="http://camosun.ca/accessible-learning">http://camosun.ca/accessible-learning</a>
Counselling	<a href="http://camosun.ca/counselling">http://camosun.ca/counselling</a>
Career Services	<a href="http://camosun.ca/coop">http://camosun.ca/coop</a>
Financial Aid and Awards	<a href="http://camosun.ca/financialaid">http://camosun.ca/financialaid</a>
Help Centres (Math/English/Science)	<a href="http://camosun.ca/help-centres">http://camosun.ca/help-centres</a>
Indigenous Student Support	<a href="http://camosun.ca/indigenous">http://camosun.ca/indigenous</a>
International Student Support	<a href="http://camosun.ca/international/">http://camosun.ca/international/</a>
Learning Skills	<a href="http://camosun.ca/learningskills">http://camosun.ca/learningskills</a>
Library	<a href="http://camosun.ca/services/library/">http://camosun.ca/services/library/</a>
Office of Student Support	<a href="http://camosun.ca/oss">http://camosun.ca/oss</a>
Ombudsperson	<a href="http://camosun.ca/ombuds">http://camosun.ca/ombuds</a>
Registration	<a href="http://camosun.ca/registration">http://camosun.ca/registration</a>
Technology Support	<a href="http://camosun.ca/its">http://camosun.ca/its</a>
Writing Centre	<a href="http://camosun.ca/writing-centre">http://camosun.ca/writing-centre</a>

**If you have a mental health concern**, please contact Counselling to arrange an appointment as soon as possible. Counselling sessions are available at both campuses during business hours. If you need urgent support after-hours, please contact the Vancouver Island Crisis Line at 1-888-494-3888 or call 911.

### Academic Accommodations for Students with Disabilities

The College is committed to providing appropriate and reasonable academic accommodations to students with disabilities (i.e. physical, depression, learning, etc). If you have a disability, the [Centre for Accessible Learning](#) (CAL) can help you document your needs, and where disability-related barriers to access in your courses exist, create an accommodation plan. By making a plan through CAL, you can ensure you have the appropriate academic accommodations you need without disclosing your diagnosis or condition to course instructors. Please visit the CAL website for contacts and to learn how to get started:

<http://camosun.ca/services/accessible-learning/>

### Academic Integrity

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.13.pdf> for policy regarding academic expectations and details for addressing and resolving matters of academic misconduct.

### Academic Progress

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.1.pdf> for further details on how Camosun College monitors students' academic progress and what steps can be taken if a student is at risk of not meeting the College's academic progress standards.

### Course Withdrawals Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.2.pdf> for further details about course withdrawals. For deadline for fees, course drop dates, and tuition refund, please visit <http://camosun.ca/learn/fees/#deadlines>.

### Grading Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf> for further details about grading.

### Grade Review and Appeals

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf> for policy relating to requests for review and appeal of grades.

### Mandatory Attendance for First Class Meeting of Each Course

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable reason in advance, you will be removed from the course and the space offered to the next waitlisted student. For more information, please see the "Attendance" section under "Registration Policies and Procedures"

(<http://camosun.ca/learn/calendar/current/procedures.html>) and the Grading Policy at <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf>.

### Medical / Compassionate Withdrawals

Students who are incapacitated and unable to complete or succeed in their studies by virtue of serious and demonstrated exceptional circumstances may be eligible for a medical/compassionate withdrawal. Please visit <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.8.pdf> to learn more about the process involved in a medical/compassionate withdrawal.

### Sexual Violence and Misconduct

Camosun is committed to creating a campus culture of safety, respect, and consent. Camosun's Office of Student Support is responsible for offering support to students impacted by sexual violence. Regardless of when or where the sexual violence or misconduct occurred, students can access support at Camosun. The Office of Student Support will make sure students have a safe and private place to talk and will help them understand what supports are available and their options for next steps. The Office of Student Support respects a student's right to choose what is right for them. For more information see Camosun's Sexualized Violence and Misconduct Policy: <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.9.pdf> and [camosun.ca/sexual-violence](http://camosun.ca/sexual-violence). To contact the Office of Student Support: [oss@camosun.ca](mailto:oss@camosun.ca) or by phone: 250-370-3046 or 250-3703841

### Student Misconduct (Non-Academic)

Camosun College is committed to building the academic competency of all students, seeks to empower students to become agents of their own learning, and promotes academic belonging for everyone. Camosun also expects that all students to conduct themselves in a manner that contributes to a positive, supportive, and safe learning environment. Please review Camosun College's Student Misconduct Policy at <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.5.pdf> to understand the College's expectations of academic integrity and student behavioural conduct.

**Changes to this syllabus:** Every effort has been made to ensure that information in this syllabus is accurate at the time of publication. The College reserves the right to change courses if it becomes necessary so that course content remains relevant. In such cases, the instructor will give the students clear and timely notice of the changes.