

# COURSE SYLLABUS



COURSE TITLE: Math097 | College Prep – Mathematics II

CLASS SECTION: D01

TERM: Summer 2021

DELIVERY METHOD(S): Online

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

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

The COVID-19 pandemic has presented many challenges, and Camosun College is committed to helping you safely complete your education. Following guidelines from the Provincial Health Officer, WorkSafe BC, and the B.C. Government to ensure the health and wellbeing of students and employees, Camosun College is providing you with every possible protection to keep you safe. Our measures include COVID Training for students and employees, health checks, infection control protocols including sanitization of spaces, PPE and ensuring physical distancing. For details on these precautions please follow this link: <http://camosun.ca/covid19/faq/covid-faqs-students.html>. However, if you're at all uncomfortable being on campus, please share your concerns with your Instructor. If needed, alternatives will be discussed.

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*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: Dr. Muhammad Awais

EMAIL: [awaism@camosun.bc.ca](mailto:awaism@camosun.bc.ca)

CLASS TIME: Monday to Friday | 8:30 - 10:20 AM | Zoom Link: <https://uvic.zoom.us/j/88612987718>

OFFICE HOURS: 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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The Calendar description is available on the Web @: <http://camosun.ca/learn/calendar/current/web/math.html>

## REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

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- a) **Textbook:** 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>
- b) **Calculator:** The Sharp-EL 531 is the model I will be using.

## 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 2019/20 Edition. We will cover Chapters 1, 2, 3, 5, 6, 7, 8, 9, and 13 and 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, stretching and shrinking,
  - 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 functions,
  - 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 any 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 equations,

- 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:  $\log_b b = 1$ ,  $\log_b 1 = 0$ ,  $\log_b (b^x)$ , and so on.
  - 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.

## COURSE SCHEDULE for 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.

ACTIVITY	Tentative Dates
Homework - 1	July 14
Midterm Exam - 1	July 16
Homework - 2	July 28
Midterm Exam - 2	July 30
Homework - 3	August 11
Midterm Exam – 3	August 13

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
CheckPoint Quizzes	10 %
Assignments	20 %
Midterm Tests	30 %
Final Exam	40 %
	<b>TOTAL</b> 100%

If you have a concern about a grade you have received for an evaluation, please email me as soon as possible [no later than 7 calendar days]. 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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### Final Exam

The final exam will cover the entire course and will be 2 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. The calendar specifically states that “holidays or scheduled flights are not considered to be emergencies.” The final exam schedule is generally posted by the end of July for July-August courses.

## CheckPoint Quizzes

The CheckPoint quizzes are to be taken every day after the lecture, and assess your understanding of the taught material. They are due at 11:00 PM every day of the lecture.

## Assignments

There will be three homework assignments which you will do on the dates mentioned above. Assignment solutions will be posted on D2L and are due most Wednesday nights at 11:00 PM. All homework will have two stages. There is a portion tested on D2L as a multiple choice quiz (25% of the homework grade), graded by the computer, followed by a portion that you write out by hand and scan in (75% of the homework grade).

## Midterm Tests

There will be three in-class (synchronous) term tests. No make-up tests will be given; if you have an emergency, please talk to me as soon as possible. Otherwise, you will receive a grade of 0 for any missed test.

Regardless of the reason, **there will be no make-up midterm tests**. If you miss a midterm test due to illness, accident, or family affliction, you should very quickly notify the instructor, and provide a written request to be excused as well as supporting documentation. In such cases, your performance on the rest of the term's work, not including the final exam, will be used to compute a numerical score for the missed midterm.

Tests will also have two stages. There is a portion tested on D2L as a multiple choice quiz (25% of the midterm grade), graded by the computer, followed by a portion that you write out by hand and scan in (75% of the midterm grade). Tests are open book, are timed, and are individual.

## 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/>.

Support Service	Website
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>

Support Service	Website
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.

## COLLEGE-WIDE POLICIES, PROCEDURES, REQUIREMENTS, AND STANDARDS

### 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.*