

# COURSE SYLLABUS



COURSE TITLE: MATH-115: Precalculus

CLASS SECTION: 001

TERM: W2023

COURSE CREDITS: 4

DELIVERY METHOD(S): LEC

Camosun College campuses are located on the traditional territories of the Lək'wəḡən 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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*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 of the first class, you will be removed from the course and the space offered to the next waitlisted student.*

## INSTRUCTOR DETAILS

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NAME: Laura Shepherd

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

OFFICE: E258

HOURS: M-F 10:30-11:20, Tu-F 12:30-1:20

## CALENDAR DESCRIPTION

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This course provides excellent preparation for MATH 100 - Calculus 1. If your prerequisite is more than two years old, consider refreshing your skills with MATH 077 before taking 115. Topics: polynomial, rational, exponential, logarithmic, trigonometric and inverse trigonometric functions; sequences and series; a brief introduction to calculus.

### PREREQUISITE(S):

One of:

B in Pre-calculus 11; C in Pre-calculus 12; B in MATH 073; B in MATH 077; C in MATH 097; C in MATH 107; B in MATH 137

### CO-REQUISITE(S):

Not Applicable

### EXCLUSION(S):

Notes: Only one of MATH 107 or MATH 115 may be used towards a Camosun College credential.

## COURSE LEARNING OUTCOMES / OBJECTIVES

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Upon completion of this course a 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.

#### REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

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Textbook: Algebra & Trigonometry (11th. Edition) by Sullivan  
Calculator: SHARP EL-531 Scientific Calculator

## EVALUATION OF LEARNING

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DESCRIPTION	WEIGHTING
<b>In Class Questions:</b> Once a week, during the first 5 minutes of class, there will be a question based on the previous lectures content.	5%
<b>Term Tests:</b> There will be 4 terms tests. There are no make-up tests. (Trig Proof Test is worth 5%)	55%
<b>Final Exam:</b> Students must be available to write the exam during the scheduled date, time and place.	40%
<b>TOTAL</b>	100%

## COURSE GUIDELINES & EXPECTATIONS

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MATH 115 is a difficult course. It is important that you have a solid back-ground in algebra. Success in the course will require a lot of your time, approximately 4 hours of studying each and every day. Besides learning the course material through the lessons, its important that you work diligently through numerous homework problems so as to reinforce your understanding, not to mention prepare yourself for the in class questions, tests and the final exam. Be sure to keep up with the course material and do not let yourself fall behind.

## SCHOOL OR DEPARTMENTAL INFORMATION

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The Camosun Math Help Center is located in E224. This is a drop in centre where you can get help with your homework. The hours will be posted on door.

## 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>

### 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.

### 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.