# COURSE SYLLABUS

COURSE TITLE: MATH-115: Precalculus

CLASS SECTION: 001

TERM: F2022

COURSE CREDITS: 4

DELIVERY METHOD(S): LEC

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.

*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

NAME: Laura Shepherd

EMAIL: shepherd@camosun.bc.ca

OFFICE: E258

HOURS: M-F 9:30am-10:20am & M-Th 11:30am-12:20pm

*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

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

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 nth 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

Textbook: Algebra & Trigonometry (11th. Edition) by Sullivan (on-line only)

SHARP EL-531 Calculator

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

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

| WEEK or DATE RANGE | ACTIVITY or TOPIC | OTHER NOTES |
|---|---|---|
| 1 | R.5-2.1 | Q1 |
| 2 | 2.1-3.3 | Q2 |
| 3 | 3.4-4.3 | Q3 |
| 4 | 3.6-4.5 | Q4 |
| 5 | 4.3-4.5 | Q5 & Test 1 |
| 6 | 5.4-6.2 | Q6 |
| 7 | 6.2-6.7 | Q7 |
| 8 | 6.8-7.2 | Q8 & Test 2 |
| 9 | 7.3-7.8 | Q9 |
| 10 | 8.1-8.3 | Q10 |
| 11 | 8.3-8.5 | Q11 |
| 12 | 8.5-8.6 | Q12 & Test 3 |
| 13 | 13.1-13.3 | Q13 |
| 14 | 13.3 | Q14 |
| Dec. 13 -21 | Final Exam | |

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 noticed is required. Deadlines can be reviewed on the CAL exams page. http://camosun.ca/services/accessible-learning/exams.html

## EVALUATION OF LEARNING

| DESCRIPTION | | WEIGHTING |
|---|---|---|
| **In Class Questions:** Once a week, during the first 5 minutes of class, there will be a question based on the previous lectures content | | 5% |
| **Term Tests:** There will be 3 terms tests. There are no make-up tests. | | 55% |
| **Final Exam:** Students must be available to write the exam during the scheduled date, time and place. | | 40% |
| **Minimum consequences for academic dishonesty in this course are as follows:**<br><br>**Weekly Questions:** The student will receive a zero for all of the weekly questions.<br><br>**Term Test:** The student will receive a zero for the term test.<br><br>**Final Exam:** The student will receive a failing grade for the course and a letter to the dean detailing your actions. | TOTAL | 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 policy for more information.

http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf

## COURSE GUIDELINES & EXPECTATIONS

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

The Camosun Math Help Center in 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

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

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

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. To contact the Office of Student Support: 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.