

COURSE SYLLABUS



COURSE TITLE: MATH-156: Math and Stats for Computing

CLASS SECTION: X02

TERM: Winter 2024

COURSE CREDITS: 3

DELIVERY METHOD(S): In-person Lecture

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](#).

INSTRUCTOR DETAILS

NAME: Patricia (Pat) Wrean

EMAIL: wrean@camosun.ca

OFFICE: CBA 153

HOURS: Tuesday 11:30 am – 12:20 pm, Thursday 12:30 pm to 1:20 pm

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

Restricted to students in Information and Computer Systems or Interactive Media Developer. Students will learn mathematical and statistical concepts relevant to introductory computer programming for development of programming and data interpretation skills. Students will study binary numbers, logic, Boolean algebra, sequences and series, and asymptotic (Big-O) notation, counting techniques, introductory probability, descriptive statistics, and confidence intervals.

PREREQUISITE(S):

One of:

C in Math 12 ; C+ in Pre-calculus 11; C in MATH 097; C in MATH 107; C in MATH 115; C in MATH 139; C+ in MATH 073; C+ in MATH 077

CO-REQUISITE(S):

Not Applicable

EXCLUSION(S):

Not Applicable

COURSE LEARNING OUTCOMES / OBJECTIVES

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

1. Show fluency with the numbering systems commonly used in computer science.
 - a. Count using binary, octal, and hexadecimal bases.
 - b. Convert decimal numbers to and from binary, octal, and hexadecimal bases.
 - c. Convert real numbers between binary, octal, and hexadecimal bases.

2. Use correct terminology, notation, and symbolic processes in logic and Boolean algebra to facilitate proper programming skills and logical thinking.
 - a. Use truth tables to define the logical connectives “and”, “or”, and “not.”
 - b. Complete truth tables and use the laws of logic to simplify logical and Boolean expressions and prove equivalence.
 - c. Use the conditional and related logical forms to translate English expressions into logical symbols and analyze conditional and biconditional propositions.

3. Use sequences and series to solve applied problems used in programming.
 - a. Solve problems involving general and recursive forms for sequences, including the arithmetic and geometric cases.
 - b. Evaluate sums for arithmetic and geometric series.

4. Use asymptotic (Big-O) notation to describe the response of various types of computer algorithms to changes in input size.
 - a. Sketch graphs of linear, polynomial, exponential and logarithmic functions.
 - b. Rank computer algorithms for efficiency based on their Big-O complexity.

5. Use probability theory to solve applied problems.
 - a. Use counting techniques to solve applied problems.
 - b. Calculate probabilities using simple events, counting techniques, and the properties of probability.
 - c. Perform calculations involving the Normal distribution.

6. Organize, summarize, display, and interpret data in a meaningful way using descriptive statistical techniques.
 - a. Describe a data set numerically by way of the mean, median, and standard deviation.
 - b. Interpret histograms and other graphical displays of data sets.
 - c. Make predictions about the distribution of a data set using the Empirical Rule and Tchebyshev's Theorem.

7. Use inferential statistical techniques to make predictions about populations.
 - a. Discuss issues associated with collecting and interpreting data from sample surveys.
 - b. For large samples, calculate and interpret confidence intervals for population means.
 - c. Determine appropriate sample sizes.

8. Identify and articulate issues regarding the use and misuse of statistics in society, to gain an awareness of proper uses of statistics in the workplace.

REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

Calculator - Only ordinary scientific calculators (non-graphing, non-programmable) are permitted. The use of other electronic devices such as cell phones, MP3 players, iPods, electronic translators, etc., during exams is not allowed. During exams, you cannot share calculators between students.

Texts - All course materials are online and available on the course websites.

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 |
|--------------------|--|-------------|
| Weeks 1 to 2 | Chapter 1: Binary, Octal, and Hexadecimal | |
| Weeks 2 to 5 | Chapter 2: Logic | |
| Weeks 5 to 6 | Chapter 3: Sequences and Series | |
| Week 8 | Chapter 4: Big O Notation and Algorithmic Complexity | |
| Weeks 8 to 9 | Chapter 5: Describing Data with Graphs | |
| Weeks 9 to 10 | Chapter 6: Describing Data with Numbers | |
| Weeks 10 to 11 | Chapter 7: Producing Data | |
| Weeks 11 to 12 | Chapter 8: Intro to Probability | |
| Weeks 12 to 13 | Chapter 9: Sampling Distributions | |
| Weeks 13 to 14 | Chapter 10: Confidence Intervals | |

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

| DESCRIPTION | WEIGHTING |
|---|--------------|
| Best 3 out of 4 tests (each test is 20% each) | 60% |
| Online WeBWork homework assignments | 5% |
| Final exam | 35% |
| | 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

Tests: There will be four term tests. The first time a student misses a test for any reason, then that will be your “drop” test. No documentation is required for the first absence. Further absences will be treated on a case-by-case basis, and it is the student’s responsibility to contact the instructor within a reasonable amount of time to explain the further absence. ***If*** that further absence is excused, the weight of the missed test will be transferred to the final exam. The tentative test dates may be found at http://wrean.ca/math156/math156_tests.htm .

Weekly WeBWork Assignments: The lowest assignment grade will be dropped when calculating the average of your WeBWork assignments. This allows a student to miss one assignment for any reason, including illness, without penalty. Each student can also ask for a week’s extension on one assignment for any reason, no questions asked. Otherwise, late submissions will not be accepted. ***In order to get a full understanding of the course materials, the online assignments will not be enough. Please also work through the practice tests and/or textbook questions.***

Final Exam: The final exam will cover the entire course and will be 3 hours long. As stated in the current college calendar, “students are expected to write tests and final examinations at the scheduled time” Exceptions will only be considered due to emergency circumstances as outlined in the calendar. Holidays or scheduled flights are not considered to be emergencies.

Collaboration: Student are encouraged to collaborate (work together) on assignments and to consult the Math Lab tutor and/or the instructor when stuck. However, you must be prepared to answer similar questions on your own for the tests, so it is vital that you yourself understand all of the assigned questions and work that you turn in.

Academic Integrity: The Department of Mathematics and Statistics has prepared a handout called Student Guidelines for Academic Integrity to help you interpret college policies involving student conduct, academic dishonesty, plagiarism, etc. The course website has a link to the handout on the About page. It is your responsibility to become familiar with the contents of the document and the college policies it references.

SCHOOL OR DEPARTMENTAL INFORMATION

Interurban Math Lab (TEC 142)

Services: Individual free tutoring and study space

Schedule: posted on the door

Format: Drop in –first-come first-served

Chair of the Math & Stats Department: Patrick Montgomery

Phone: 250-370-3502

Office: Ewing 268, Lansdowne Campus

Email: montgomeryp@camosun.ca

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 |

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|--------------------|---|
| 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.