

COURSE SYLLABUS



COURSE TITLE: MATH-250A: Intermediate Calculus 1

CLASS SECTION: X01 and X02

TERM: 2021 Fall

COURSE CREDITS: 4

DELIVERY METHOD(S): Interurban Campus

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](#).

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

NAME: Raymond Lai

EMAIL: lai@camosun.bc.ca

PHONE: 250-370-4491

OFFICE: CBA 152

HOURS: Monday 1:30 pm – 2:20 pm, Tuesday 12:30pm – 3:20pm, and 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

Restricted to students in Engineering Bridge This course in single variable calculus includes integrating using various techniques, evaluating limits in indeterminate forms, testing convergence and approximating value of infinite series, integrating in polar coordinates, and calculus of vector-valued functions.

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|-------------------------------------|----------------------------|---------------|----------------|
| PREREQUISITE(S) or CO-REQUISITE(S): | All of: • C in MATH 251 | EXCLUSION(S): | Not Applicable |
|-------------------------------------|----------------------------|---------------|----------------|

COURSE LEARNING OUTCOMES / OBJECTIVES

Upon completion of this course students will be able to:

1. Differentiate inverse trig functions.
2. Integrate polynomials, trigonometric and inverse trigonometric functions, and exponential and logarithmic functions.

3. Evaluate limits of indeterminate forms, and calculate improper integrals.
4. Use integration to find area, volume, arc length, surface area of revolution, work, moments and centroids.
5. Integrate using substitution, parts, trigonometric integrals, trigonometric substitution, and partial fractions.
6. Test a sequence for convergence and explain the difference between convergence of a sequence and convergence of a series.
7. Test series for convergence using the integral test, p-test, comparison tests, alternating series test and ratio test and explain the difference between convergence and absolute convergence.
8. Estimate the error in approximating a series using improper integrals and the alternating series remainder.
9. Calculate Taylor polynomials, power series, Taylor series, and Maclaurin series and estimate the error in an approximation using Taylor's Theorem.
10. Determine the interval of convergence of a power series.
11. Graph and analyze parametric and polar curves and find their first and second derivatives.
12. Perform integration computations with parametric and polar curves to compute area, arc-length, volume and surface area.
13. Sketch, differentiate, and integrate vector-valued functions to find velocities, accelerations, tangents, and normals.

REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

- (a) Course Notes (accessible from the course D2L site)
- (b) Text (Optional Reference): Gilbert Strang, Edwin "Jed" Herman, Calculus: Volume 1, 2, and 3, OpenStax, 2016 [all available for free at BCCampus Open Education <https://open.bccampus.ca/>]
- (c) Non-graphing non-programmable scientific 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 & DATE RANGE | ACTIVITY or TOPIC |
|----------------------|--|
| Week 1 (9/7 – 9/10) | Section 1.1 Basic Differentiation Rules; Tangent Line and Normal Line [~2 hours] |
| | Section 1.2 Derivatives of Inverse Trigonometric Functions [~1 hour] |
| | Section 2.1 Integration Rules and General Power Rule [~1 hour] |
| Week 2 (9/13 – 9/17) | Section 2.2 Integration by Substitution [~1 hour] |
| | Section 2.3 Applications of Integrals [~4 hours] |
| Week 3 (9/20 – 9/24) | Section 2.4 Integration of Exponential Functions [~1 hour] |
| | Section 2.5 Inverse Trigonometric Functions [~2 hours] |
| | Section 2.6 Integration by Parts (Tabular Method) [~2 hours] |
| Week 4 (9/27, 9/28) | Help Session (for preparation of test 1 covering sections 1.1 – 2.6 on Wednesday 9/29) |

| WEEK & DATE RANGE | ACTIVITY or TOPIC |
|---|---|
| Week 4 (10/1) Week 5 (10/4 – 10/8) Week 6 (10/11 – 10/15) | Section 2.7 Trigonometric Integrals [~3 hours] |
| | Section 2.8 Integration of Rational Functions by using Partial Fractions [~2 hours] |
| | Section 2.9 Trigonometric Substitutions [~2 hours] |
| | Section 3.1 Basic Indeterminate Forms ($0/0$ and ∞/∞) and L'Hôpital's Rule [~1 hour] |
| | Section 3.2 Other Indeterminate Forms ($0 \cdot \infty$, $\infty - \infty$, 1^∞ , ∞^0 , and 0^0) [~2 hours] |
| Week 7 (10/18 – 10/22) | Section 3.3 Improper Integrals: Infinite Limits and Infinite Discontinuities [~2 hours] |
| | Section 4.1 Parametric Curves, First and Second Derivatives [~1 hour] |
| | Section 4.2 Applications of Parametric Curves [~2 hours] |
| Week 8 (10/25, 10/26) | Help Session (for preparation of test 2 covering sections 2.7 – 4.2 on Wednesday 10/27) |
| Week 8 (10/28, 10/29) | Section 5.1 Polar Coordinates, Polar Graphs, First Derivative [~2 hours] |
| Week 9 (11/1 – 11/5) | Section 5.2 Applications of Polar Curves [~3 hours] |
| | Section 6.1 Sequence Convergence [~1 hour] |
| | Section 6.2 Series Convergence: Geometric Series and nth Term Divergence Test [~1 hour] |
| Week 10 (11/8 – 11/12) Week 11 (11/15 – 11/17) | Section 6.3 The Integral Test [~2 hours] |
| | Section 6.4 The p-series Test [~1 hour] |
| | Section 6.5 Direct Comparison Test and Limit Comparison Test [~2 hours] |
| | Section 6.6 The Alternating Series Test and Absolute Convergence [~1 hour] |
| | Section 6.7 The Ratio Test [~1 hour] |
| Week 11 (11/19) Week 12 (11/22) | Help Session (for preparation of test 3 covering sections 5.1 – 6.7 on Tuesday 11/23) |
| Week 11 (11/18) Week 12 (11/24) | Section 6.8 Taylor Polynomials and Taylor's Remainder Theorem [~2 hours] |
| Week 12 (11/25 – 11/26) Week 13 (11/29 – 12/2) | Section 6.9 Maclaurin Series and Taylor Series [~1 hour] |
| | Section 6.10 Power Series: Interval of Convergence and their Operations [~2 hours] |
| | Section 7.1 Vector-Valued Functions for Velocity and Acceleration [~2 hours] |
| | Section 7.2 Tangential and Normal Components of Acceleration [~1 hour] |
| Week 13 (12/3) Week 14 (12/6) | Help Session (for preparation of test 4 covering sections 6.8 – 7.2 on Tuesday 12/7) |

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 | |
|---|-------------------|---------------------|
| | (a) No Final Exam | (b) With Final Exam |
| Test 1: sections 1.1 – 2.6 (Tentative Date: Wednesday Sept 29 th) | 27% | 13.5% |
| Test 2: sections 2.7 – 4.2 (Tentative Date Wednesday Oct 27 th) | 27% | 13.5% |
| Test 3: sections 5.1 – 6.7 (Tentative Date Tuesday Nov 23 rd) | 27% | 13.5% |
| Test 4: sections 6.8 – 7.2 (Tentative Date Tuesday Dec 7 th) | 19% | 9.5% |
| Final Exam (This will take place during the period of Dec 13 th to Dec 21 st) | | 50% |
| TOTAL | 100% | |

If your performance on each term test is at least 30%, you do not need to write the comprehensive final exam and your course grade can be determined 100% by your performances on the term tests using weighting (a); otherwise your course grade will be calculated using weighting (b).

Note:

- There is no makeup for missed test (except for documented medical reasons).
- Regardless of what your term mark is, you can opt in to write the comprehensive final examination (by signing up in the “Opt in” quiz in D2L between Dec 6th and Dec 10th) and your course grade will then be calculated using weighting (b).
- Once you opt in writing the final examination, your course grade will be calculated using weighting (b), and you cannot go back to use 100% term work using weighting (a).
- You can get a better grade or a worse course grade depending on whether your performance in the final examination is better or worse than that in the term.

For instance:

| | Term Tests | Final Exam | Course |
|-----------|------------|-----------------------|----------|
| Student 1 | 80% (A-) | Do Not Write | 80% (A-) |
| Student 2 | 80% (A-) | (Opt in to write) 90% | 85% (A) |
| Student 3 | 80% (A-) | (Opt in to write) 60% | 70% (B-) |
| Student 4 | 55% (D) | (Opt in to write) 75% | 65% (C+) |
| Student 5 | 55% (D) | (Opt in to write) 45% | 50% (D) |

- According to the requirements of the Engineering Bridge Programs, you need to get 60% (letter grade C) if you are a first-timer and 65% (letter grade C+) if you are repeating the course.

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>

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

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.