COURSE SYLLABUS

COURSE TITLE: MATH-250B: Intermediate Calculus 2

CLASS SECTION: X01 and X02

TERM: 2023 Winter

COURSE CREDITS: 3

DELIVERY METHOD(S):   Interurban Campus

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   OFFICE: CBA 152   EMAIL: lai@camosun.ca   PHONE: 250-370-4491

HOURS: Tuesday 11:30am – 12:20pm, Wednesday 1:30pm – 4:20pm, 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 multivariable calculus includes evaluating partial derivatives, computing directional derivative and gradient, solving optimization problems using Lagrange Multipliers, setting up and evaluating multiple integrals for various applications in engineering, vector calculus, evaluating line integral using Green's Theorem, evaluating surface integral using divergence theorem, and evaluating line integral using Stokes' Theorem.

PREREQUISITE(S):	CO-REQUISITE(S):	EXCLUSION(S):
All of: • C in MATH 250A	Not Applicable	Not Applicable

COURSE LEARNING OUTCOMES / OBJECTIVES

Upon completion of this course students will be able to:

1. Differentiate functions of many variables and use chain rules to differentiate composite functions.
2. Compute gradients and directional derivatives.
3. Solve constrained optimization problems using Lagrange multipliers.
4. Set up and evaluate multiple integrals to find areas, volumes, masses, centres of mass, and moments of inertia.
5. Change variables in multiple integrals to cylindrical, spherical, or general coordinates.
6. Compute the divergence and the curl of a vector field, and find the potential function for conservative fields.
7. Set up and evaluate line and surface integrals.
8. Use Green's theorem to evaluate line integrals.
9. Use Stokes' theorem and the divergence theorem to evaluate line and surface integrals.

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)	Topic	
Weeks 1 – 2 (Jan 9 – Jan 20)	Section 1.1 Partial Derivatives of Functions of Several Variables and Critical Points of Functions of Two Variables (5 – 10 hrs)	Partial Differentiation
	Section 1.2 The Multivariable Chain Rule (1 – 2 hrs)	
Weeks 3 – 4 (Jan 23 – Feb 3)	Study Sessions to prepare for Test 1 (tentatively on 1/26): sections 1.1 – 1.2	
	Section 1.3 Gradient Vector and Directional Derivatives (1 – 2 hrs)	
	Section 1.4 Lagrange Multipliers and Constrained Optimization (3 hrs)	
Weeks 5 – 6 (Feb 6 – Feb 17)	Section 2.1 Area and Volume by Double Integration (2 hrs)	Multiple Integrals
	Section 2.2 Mass, Centre of Mass, and Moment of Inertia by Double Integration (1 hr)	
	Section 2.3 Change of Variables in Double Integrals (3 hrs)	
	Study Sessions to prepare for Test 2 (tentatively on 2/16): sections 1.3 – 2.2	
Week 7 (Feb 20 – Feb 24)	Family Day and Reading Break (College Closed)	
Week 8 (Feb 27 – Mar 3)	Section 2.4 Triple Integrals in Rectangular Coordinates (2 hrs)	
	Section 2.5 Change of Variables in Triple Integrals (1 hr)	
Week 9 (Mar 6 – Mar 10)	Section 2.6 Triple Integrals in Cylindrical and Spherical Coordinates (3 hrs)	
	Section 3.1 Line Integrals (1 hr)	Vector Calculus
Weeks 10 – 11 (Mar 13 – Mar 24)	Section 3.2 Potential Function for Conservative Fields and The Fundamental Theorem of Line Integrals (2 hrs)	
	Section 3.3 Green's Theorem (1 hr)	
	Section 3.4 Surface Integrals (3 hrs)	
	Study Sessions to prepare for Test 3 (tentatively on 3/23): sections 2.3 – 3.2	
Weeks 12 – 13 (Mar 27 – Apr 7)	Section 3.4 (Continued)	
	Section 3.5 Divergence Theorem (1 hr)	
	Section 3.6 Stokes' Theorem (1 hr)	
	Study Sessions to prepare for Test 4 (tentatively on 4/6): sections 3.3 – 3.6	
	Good Friday (College Closed)	
Week 14 (Apr 10 – Apr 14)	Easter Monday (College Closed)	
	Study Sessions to prepare Comprehensive Final Exam	
Apr 17 – Apr 25	Final Exam (Plan your travel and book your flights wisely)	

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 scan be reviewed on the CAL exams page. http://camosun.ca/services/accessible-learning/exams.html

EVALUATION OF LEARNING

DESCRIPTION	WEIGHTING				
	(a) No Final Exam [only if you get at least 50% in each term test]		(b) With Final Exam		
Term Test 1	24%	100% Term Tests	14.4%	60% Term Tests	
Term Test 2	32%		19.2%		
Term Test 3	26%		15.6%		
Term Test 4	18%		10.8%		
Final Exam			40% Final Exam		
TOTAL	100%				

If your performance on each term test is at least 50%, 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 – details to be released in D2L after test 4) and your course grade will then be calculated using weighting (b).
- Once you submit your final decision of 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) 95%	$0.6(80\%) + 0.4(95\%) = 86\%$ (A)
Student 3	80% (A-)	(Opt in to write) 75%	78% (B+)
Student 4	55% (D)	(Opt in to write) 70%	61% (C)
Student 5	55% (D)	(Opt in to write) 50%	53% (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 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.