CAMOSUN COLLEGE
School of Arts & Science
Department of Mathematics & Statistics

MATH-250B-DX01
Intermediate Calculus 2
Winter 2021

COURSE OUTLINE

The course description is online @ http://camosun.ca/learn/calendar/current/web/math.html

Ω *Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.*

1. Instructor Information

(a)	Instructor:	Raymond Lai	
(b)	Virtual Office Hours (using Blackboard Collaborate Ultra in D2L):	Monday	Thursday
		8:30am – 9:20am 9:30am – 10:20am,	12:30 pm – 1:20pm 1:30 pm – 2:20pm
		Also by email appointment (preferably 24 hours in advance and first come first booked) – check the module "Email Appointment Confirmation" in the D2L Content Page for time available	
(c)	Office Location:	Blackboard Collaborate Ultra in D2L	
(d)	Office Phone:	250-370-4491	
(e)	Email:	lai@camosun.bc.ca	
(f)	Website:	https://sites.camosun.ca/raymondlai/	

2. Intended Learning Outcomes

Upon completion of this course the student 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.

3. Required Materials

(a) Course notes (accessible from the course D2L site)
(b) Texts: (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) Other: Non-graphing non-programmable scientific calculator.

4. Course Content and Schedule

Chapter 1: Partial Differentiation ·

Section 1.1 [~ 5 to 10 hours] Partial Derivatives of Functions of Several Variables and Critical Points of Functions of Two Variables
Section 1.2 [~ 1 to 2 hours] The Multivariable Chain Rule
Section 1.3 [~ 1 to 2 hours] Gradient Vector and Directional Derivatives
Section 1.4 [~ 3 hours] Lagrange Multipliers and Constrained Optimization

Chapter 2: Multiple Integrals ·

Section 2.1 [~ 2 hours] Area and Volume by Double Integration
Section 2.2 [~ 1 hour] Mass, Centre of Mass, and Moment of Inertia by Double Integration
Section 2.3 [~ 3 hours] Change of Variables in Double Integrals
Section 2.4 [~ 2 hours] Triple Integrals in Rectangular Coordinates
Section 2.5 [~ 1 hour] Change of Variables in Triple Integrals
Section 2.6 [~ 3 hours] Triple Integrals in Cylindrical and Spherical Coordinates

Chapter 3: Vector Calculus ·

Section 3.1 [~ 1 hour] Line Integrals
Section 3.2 [~ 2 hours] Potential Function for Conservative Fields and The Fundamental Theorem of Line Integrals
Section 3.3 [~ 3 hours] Surface Integrals
Section 3.4 [~ 1 hour] Green's Theorem
Section 3.5 [~ 1 hour] Divergence Theorem
Section 3.6 [~ 1 hour] Stokes' Theorem

Lectures, Reviews, Study Sessions	Tests	Holidays and Reading Break	Total
45 hours	4 hours	7 hour	56 hours

	Test 1	Test 2	Test 3	Test 4
Tentative Date (Victoria local time)	Feb 8th (Mon)	Mar 8th (Mon)	Mar 29th (Mon)	Apr 12th (Mon)
Sections Covered	1.1 to 1.3	1.4 to 2.3	2.4 to 3.2	3.3 to 3.6

5. Basis of Student Assessment (Weighting)

Your course grade will be determined by using one of the following two methods:

(a) If your performance on each of the four term tests is at least 30%, your course grade can be determined 100% by your performances on the term tests using the following weighting – Table 1 (you do not need to write the comprehensive final exam but you can opt in if you want to – see Table 2 below):

Table 1	Test 1	Test 2	Test 3	Test 4
Weight	27%	27%	27%	19%

(b) If you fall short of getting at least 30% in any of the term tests, you will need to write the comprehensive final exam. and your course grade will then be determined using the following weighting – Table 2:

Table 2	Test 1	Test 2	Test 3	Test 4	Comprehensive Final Exam.
Weight	13.5%	13.5%	13.5%	9.5%	50%
	(Term tests together count for 50%)				

The final examination will take place during the period of Apr 19th to Apr 27th

Note:

- Thorough understanding of the examples discussed in class and the assignments/practices will be essential for success on the term tests.
- There is no makeup for missed test (except for documented medical reasons).
  Requests for makeup tests due to illness must be supported by your physician's note.
- Regardless of what your term mark is, you can opt in to write the comprehensive final examination (by notifying the instructor with email during the last week of classes and receiving confirmation from the instructor).
- Once you opt in writing the final examination, you cannot go back to use 100% term work for your course grade.
- 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 Test Minimum	**Weighted Term Tests**	**Final Exam**	**Course**
Student 1	40%	80%	Do not write	80%
Student 2	40%	80%	(Opt in to write) 90%	85%
Student 3	40%	80%	(Opt in to write) 60%	70%
Student 4	40%	55%	(Opt in to write) 75%	65%
Student 5	40%	55%	(Opt in to write) 45%	50%
Student 6	20%	80%	(Need to write) 90%	85%
Student 7	20%	80%	(Need to write) 60%	70%
Student 8	20%	55%	(Need to write) 75%	65%
Student 9	20%	55%	(Need to write) 45%	50%

Instructions on writing Online Tests:

- 1. Download and print out this test from the course D2L site.
  2. Complete the test in ink (or using pencil), please make sure it is dark enough for scan to be legible).
  3. Scan the finished test and save it as one single pdf file.
  4. Submit your pdf file before the due time.
- You have 50 minutes to write each term test. Taking into consideration of the work before and after writing the test (such as printing and scanning), the start time of the 50-minute test is 15 minutes before the class start time and the end time (also the due time of submission) of the test is 15 minutes after the class end time.
  If your submission is late, your grade may be adjusted with the late factor:

$$\text{Late Factor} = \frac{\text{Time Allowed}}{\text{Time Allowed} + \text{Your Overtime}}$$

  If you make multiple submissions and your last submission is late, the late factor (with overtime computed using the time of your last submission) will be applied to the whole test (not only to the portion of the test you submitted late).

- The tests are individual and closed book. The only materials you can use are our course formula sheet and non-graphing non-programmable scientific calculators.
- You earn credits by using **only** the method(s) used in the examples in class and/or in the notes. Other methods of solutions are not accepted.
- For full marks, show all your work (with details comparable to the examples discussed in class and/or shown in the course notes) and simplify all your answers to the best of your ability.
- Check your scan contains all pages of your solutions before submission.

6. Grading System

[X] Standard Grading System (GPA)

[ ] Competency Based Grading System

7. Recommended Materials or Services to Assist Students to Succeed Throughout the Course

How to do well in the course and where to get help

1. Do not skip classes.
2. Start working on the exercises as soon as we finish a section.
3. It is important to understand the principles involved rather than to memorize a method of solution – try variations of questions.
4. Studying in groups is an efficient way to learn mathematics; however, make sure you can solve the problems yourself.
5. Need extra help? Check out the module "Where can I get help?" under My Tools/Content on the D2L course site.

8. College Supports, Services and Policies

Immediate, Urgent, or Emergency Support

If you or someone you know requires immediate, urgent, or emergency support (e.g. illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts @ http://camosun.ca/about/mental-health/emergency.html or http://camosun.ca/services/sexual-violence/get-support.html#urgent

College Services

Camosun offers a variety of health and academic support services, including counselling, dental, disability resource centre, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit the **STUDENT SERVICES** link on the College website at http://camosun.ca/

College Policies

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies. Policies are available on the College website at http://camosun.ca/about/policies/. Education and academic policies include, but are not limited to, Academic Progress, Admission, Course Withdrawals, Standards for Awarding Credentials, Involuntary Health and Safety Leave of Absence, Prior Learning Assessment, Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, Student Appeals, Student Conduct, and Student Penalties and Fines.

A. ***GRADING SYSTEMS*** http://camosun.ca/about/policies/index.html

The following two grading systems are used at Camosun College:

1. Standard Grading System (GPA)

Percentage	***Grade***	***Description***	***Grade Point Equivalency***
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D		1
0-49	F	Minimum level has not been achieved.	0

2. Competency Based Grading System (Non GPA)

This grading system is based on satisfactory acquisition of defined skills or successful completion of the course learning outcomes

Grade	***Description***
COM	***The student has met the goals, criteria, or competencies established for this course, practicum or field placement.***
DST	***The student has met and exceeded, above and beyond expectation, the goals, criteria, or competencies established for this course, practicum or field placement.***
NC	***The student has not met the goals, criteria or competencies established for this course, practicum or field placement.***

B. Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy at http://camosun.ca/about/policies/index.html for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	***Description***
I	*Incomplete*: A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	*In progress*: A temporary grade assigned for courses that are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
CW	**Compulsory Withdrawal*: A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.***

Week	Math-250B-DX01	Course Notes Materials to Study this Week	Monday Class
1	Jan 11 - 15	Section 1.1: (a) to (k), examples 1 to 9	**No Class**
2	Jan 18 - 22	Section 1.1: (l) to (t), examples 10 to 22	Study Session
3	Jan 25 - 29	Section 1.1: (u) to (β), examples 23 to 27 Section 1.2: (a), examples 1 and 2	Study Session
4	Feb 1 - 5	Section 1.2: (b), examples 3 to 5 Section 1.3	Study Session
5	Feb 8 - 12	Section 1.4	**Test 1 (Feb 8)**
6	Feb 15 - 19	**Reading Break**	**Reading Break**
7	Feb 22 - 26	Section 2.1, Section 2.2	Study Session
8	Mar 1 - 5	Section 2.3	Study Session
9	Mar 8 - 12	Sections 2.4, Section 2.5	**Test 2 (Mar 8)**
10	Mar 15 - 19	Section 2.6	Study Session
11	Mar 22 - 26	Section 3.1, Section 3.2	Study Session
12	Mar 29 - Apr 2	Section 3.3	**Test 3 (Mar 29)**
13	Apr 5 - 9	Section 3.4, Section 3.5, Section 3.6	**Easter Monday (No Class)**
14	Apr 12 - 16	Review (if you need to take Final Exam)	**Test 4 (Apr 12)**
Final Exam Period Apr 19 - 27			