CAMOSUN COLLEGE	***School of Arts & Science*** ***MATHEMATICS DEPARTMENT*** **MATH 250B (X01 and X02)** **Intermediate Calculus 2** **2012 Q1**

COURSE OUTLINE

1. Instructor Information

Instructor:	Raymond Lai
Office Hours:	• Monday to Thursday: 10:30 am – 12:20 pm • Drop in • By appointment
Office	CBA 152
Phone:	250-370-4491
Email:	lai@camosun.bc.ca
Website:	http://faculty.camosun.ca/raymondlai/

2. Course Description

This course continues the study of intermediate calculus. Directional derivative, gradient, Lagrange Multipliers, multiple integrals, applications, vector calculus, Green's Theorem, divergence, Stokes' Theorem.

Offered: Quarter 1 and Quarter 3

Credit: 3

In-Class Workload and Format: 5 hours of lecture/week for 11 weeks

Out-of-Class Workload: 5-10 hours/week (more for students with weak background)

Prerequisites: MATH 250A. *Open to Engineering Bridge students only.*

3. Intended Learning Outcomes

Upon completion of this course the student will be able to:

1. Sketch the graph of a function of two variables using contours.
2. Evaluate limits and justify why a limit might not exist.
3. Use differentials to do computations in linear approximation and error analysis.
4. Calculate derivatives using the chain rule for functions of several variables.
5. Calculate partial derivatives implicitly.
6. Solve optimization problems using directional derivatives.
7. Find equations of tangent planes and normal lines to surfaces.
8. Find the relative extrema of a function of several variables.
9. Use the second partials test to determine the nature of relative extrema of a function of two variables.
10. Perform calculations involving the method of least squares.
11. Solve constrained optimization problems using the Lagrange Multiplier method.
12. Evaluate a double integral as an iterated integral.
13. Calculate the area of a plane region and the volume of a solid region using a double integral.
14. Evaluate double integrals in polar coordinates.
15. Calculate the mass, centre of mass and moments of inertia of a planar lamina using double integrals.
16. Find the area of the surface of a solid using a double integral.
17. Find the volume, mass, centre of mass and moments of inertia of a solid region using a triple integral.
18. Evaluate triple integrals in cylindrical or spherical coordinates.
19. Use a Jacobian to change variables in a double or a triple integral.
20. Calculate the curl and the divergence of a vector field.
21. Determine whether a vector field is conservative.
22. Evaluate a line integral, a line integral of a vector field and a line integral in differential form.
23. Perform calculations involving the Fundamental Theorem of line integrals, the concept of independent of path and of conservation of energy.
24. Use Green's Theorem to evaluate a line integral.
25. Represent a surface using a set of parametric equations.
26. Find a normal vector and a tangent plane to a parametric surface and calculate the area of a parametric surface.
27. Evaluate a surface integral as a double integral.
28. Evaluate a surface integral for a parametric surface.
29. Perform calculations using the Divergence Theorem and Stoke Theorem.

4. Required Materials

Text: Edwards and Penney, Calculus Early Transcendentals, Seventh Edition, Pearson Prentice Hall, 2008.

Non-graphing non-programmable scientific calculator (such as Sharp EL531W)

5. Course Content and Tentative Schedule

Section 9.6   Conic Section

Sections 11.7 – 11.8   Geometry of Space

Chapter 12.2 – 12.10   Partial Differentiation

Chapter 13.1 – 13.9   Multiple Integrals

Chapter 14.1 – 14.7   Vector Calculus

Lectures, Reviews, Help Sessions	Tests	Holiday	**Total**
50 hours	3 hours	2 hours	**55 hours**

6. Course Policy

- Students are required to have their mobile phones either set on vibrate or turned off while attending class and writing term tests and final examination.

- Students are responsible for announcements made in class (check with your fellow students if you have to miss a class).

7. Basis of Student Assessment (Weighting)

To get a C or better in the course, you must get 50% or higher in the final exam *and* have an overall average of 60% or higher; your numerical grade will be computed using the following two components, which is then converted to a letter grade using the standard Camosun grade scale (see Grading System (8) below).

- 3 tests (total 50%)

  o Tentatively on 18 October (20%), 13 November (15%), 30 November (15%)

  o Some tests may have a calculator free section that does not allow use of calculator

  o Thorough understanding of the examples discussed in class and the homework exercises will be essential for success on the term tests.

  o Solutions will be posted online at the class's website.

  o There is no makeup for missed test (except for documented medical reasons)

- Comprehensive Final Exam (50%)

  o During the week of 10 December – 14 December.

  o As stated in the college calendar, "Students are expected to write tests and final examinations at the scheduled time and place. … Exceptions, due to emergency circumstances, such as unavoidable employment commitments, health problems, or unavoidable family crisis, require approval of the appropriate instructor. Holidays or scheduled flights are not considered to be emergencies. The student may be required to provide verification of the emergency circumstances."

There is one exception: if your term work is at least 50% *and* you received 60% or higher in the final exam, then you will receive a C in the course *even if* your overall average is under 60%.

8. Grading System

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

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 **camosun.ca** or 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.

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 E-1.5 at **camosun.ca** for information on conversion to final grades, and for additional information on student record and transcript notations.

Note: A course with a "D" or "F" grade cannot be used as a prerequisite.

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

LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College calendar, at Student Services or the College web site at <u>camosun.ca</u>.

STUDENT CONDUCT POLICY

There is a Student Conduct Policy **which includes plagiarism**.
It is the student's responsibility to become familiar with the content of
this policy. The policy is available in each School Administration Office,
at Student Services and on the College web site in the Policy Section.

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

1. Do not skip classes. There will be problem solving techniques discussed in class **not covered** in the assignments.
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 problems yourself.
5. Extra help available from assistant at the Math Lab located at Technologies Centre (TEC) Room 142 (phone: 370-4492). This drop-in centre is freely available for your use to work on math homework and to seek help from the tutor on staff (see hours posted on the door).