Multivariable Calculus - Math 253, Section 102

Fall 2006

- *Instructor: Malabika Pramanik*

- *Office: Mathematics Building, Room 214*

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- *Email: malabika@math.ubc.ca (please use email whenever possible to ensure faster response)*

- *Office hours: Monday 12:30 - 1:30 PM, Wednesday 9:30 - 10:30 AM, or by appointment.*

- **Other resources :** In addition to the office hours of the instructor, please take advantage of the DROP IN TUTORIALS for Math 253. These are located in MSRC Room #3 on Mondays 4-5pm, Wednesdays 3-5pm, Thursdays 4-5pm, and Fridays 3-4pm.

- **Web page :** The instructor-in-charge for this course is Dr. Ailana Fraser. Her web page contains all important announcements, homework assignments and additional information about the course. The url is:

$$\text{http://www.math.ubc.ca/~afraser/253}$$

We will refer to this as the course website.

In addition to the course website, we will have a section website

$$\text{http://www.math.ubc.ca/~malabika/fall06/math253/index.html}$$

where all relevant section information (such as changes to office hours if any, past quizzes and their solutions) will be posted.

- **Text :** *Multivariable Calculus* 5th edition by James Stewart.

- **Course description :** The goal of this course is to generalize the concepts of differentiation and integration from the one-variable setting to functions of several variables. We will cover material from Chapters 13, 15, 16 of the text with some omissions and some additional material. Please see the section on "Topics" at the end of this handout.

- **Lectures :**   Monday, Wednesday, Friday 11 AM - 12 PM in A205 Buchanan.

- **Homework :**   Homework will be assigned but will not be collected or graded. The problems will be announced on the course website each lecture day, and should be completed before the following lecture.

- **Exams:** □ *Quizzes :* There will be seven short quizzes (during the last 15-20 minutes of lecture), which will be strongly based on the homework assignments. There will be one midterm exam (50 minutes). The quizzes and midterm will be in class on the following dates:

Quiz 1:	Wednesday September 20
Quiz 2:	Wednesday September 27
Quiz 3:	Wednesday October 4
Quiz 4:	Wednesday October 11
Quiz 5:	Wednesday October 18
Midterm:	Wednesday October 25
Quiz 6:	Wednesday November 8
Quiz 7:	Wednesday November 15

□ *Final exam :*

○ There will be a common final exam (not scheduled yet).
○ *Do not make any travel plans until the exam schedule has been announced.*
○ *Students will be required to bring ID to all tests and exams.*
○ No calculators or aids of any kind will be allowed in quizzes, midterms, or exams.

- **Grading:**

Quizzes	25%
Midterm	25%
Final exam:	50%

Grades will be scaled to the final exam. No make-up quizzes will be permitted; however, the lowest grade among the quizzes (which will be zero if missed) will be ignored. Missing a midterm normally results in a mark of 0. Exceptions may be granted in two cases: prior consent of the instructor or a medical emergency. In the latter case, the instructor must be notified within 48 hours of the missed test, and presented with a doctor's note immediately upon the student's return to UBC. A physician's note should specifically state that the student was medically unfit to write the missed exam on that day.

Topics

1. Vectors and the Geometry of Space ($\sim$ 1.5 weeks)

Section	Description
13.1	Three dimensional coordinate systems
13.2	Vectors
13.3	The dot product
13.4	The cross product
13.5	Equations of lines and planes
13.6	Cylinders and quadratic surfaces
13.7	Cylindrical and spherical coordinates

3. Partial Derivatives ($\sim$ 5 weeks)

Section	Description
15.1	Functions of several variables
15.2	Limits and continuity
15.3	Partial derivatives
15.4	Tangent planes and linear approximations
15.5	The chain rule
15.6	Directional derivatives and the gradient vector
15.7	Maximum and minimum values
15.8	Lagrange multipliers

4. Multiple Integrals ($\sim$ 4.5 weeks)

Section	Description
16.1	Double integrals over rectangles
16.2	Iterated integrals
16.3	Double integrals over general regions
16.4	Double integrals in polar coordinates
16.5	Applications of double integrals
16.6	Surface area
16.7	Triple integrals
16.8	Triple integrals in cylindrical and spherical coordinates
16.9	Change of variables