Math 53, Fall 2016

Text. James Stewart,*Multivariable Calculus, early transcendentals UC Berkeley*, 8th edition, ISBN number 978-1-305-75645-8.

Instructor. John R. Steel, 717 Evans Hall.

Office Hours. Mon., Wed. 1–2:30pm.

Class meeting times. MWF 11:00–12:00, 2050 VLSB.

Prerequisites Math 1A and 1B, or the equivalent.

Course Plan

- **Chapter 10** Parametric equations and polar coordinates. Approximately 1 week. (Omit 10.6.)
- **Chapters 12, 13** Vectors in 2-space and 3-space (12.1–12.5). Quadric surfaces (12.6). Vector- valued functions of one variable. (13.1, 13.2, and 13.4, pp. 838–841. We omit the rest of Chapter 13.) Approximately 2 weeks.
- **Chapter 14** Functions of several variable: partial derivatives. Approximately 3 1/2 weeks.
- **Chapter 15** Functions of several variables: multiple integrals. Approximately 3 1/2 weeks.
- **Chapter 16** Vector Analysis; Stokes' Theorem and the Divergence Theorem. Approximately 4 weeks.

We may move even more quickly through Chapters 10, 12, and 13. Because of the way the holidays work out this semester, we have less than the usual number of lectures. So the lectures will be more condensed than usual, and it is important to read carefully on your own! Chapters 14, 15, and 16 are the heart of the course. In chapter 14 we learn how to generalize the operation of differentiation to functions of several variables, and in chapter 15 we learn about integrating them. Chapter 16 contains various theorems connecting differentiation and integration, just as the fundamental theorem of calculus connects these operations in case of functions of one variable.

Homework. Homework will be assigned weekly. The assignments will announced on Sundays, and posted on the web at

`http://math.berkeley.edu/~steel/courses/Courses.html`

Homework will be collected during the Thursday discussion section 11 days after it has been assigned.

Some of the homework assignments will be accompanied with "suggested exercises", ones I recommend you do, but don't want you to hand in. In general, I recommend that you do as many as you can. In particular, the assigned homework will go lightly on the more routine exercises at the beginning of each set. You really ought to do a bunch of these before moving on to the homework to be handed in.

Lectures. In my lectures I will attempt to hit the central points, and keep the examples on the simpler side. There really isn't time to do more. Students should use their own reading, the discussion sections, and the homework to go into greater depth, and to tackle more complicated problems.

The lectures will inevitably stress the more theoretical aspects of the course. Theory is important! Without it, you have just a collection of problem-solving recipes which are easily forgotten, and whose applicability to new situations is impossible to determine. In short, if you don't understand the rationale for the recipes, you won't get much from the course in the long run.

Students should balance the more theoretical emphasis of the lectures by attending discussion sections, doing homework, and doing as many additional exercises as they can on their own.

Exam schedule. The first midterm will be held on Wed. Oct. 5, 11:00-12:00, in 2050 VLSB. The most likely date for the second midterm is Friday Nov. 4. I will confirm this date immediately after the first midterm. The final exam will be held Monday. Dec. 12, 11:30–2:30. (Exam group 2.)

Grading. There will be two midterms and a final. Each midterm is worth 17%, and the final exam is worth 40%. The remaining 26% will be determined by your GSI on the basis quizzes given at discussion section (at least 15%),homework, and class participation.

Enrollment For general information on enrollment see http://math.berkeley.edu/courses/enrollment-scheduling. For enrollment matters, see Jennifer Pinney. Her office is on the 9th floor of Evans Hall, and students can see her most days 9-12 and 1-4. Students must attend the discussion sections they are registered for.

Course web site. Course information and homework assignments will be available online at

`http://math.berkeley.edu/~steel/courses/Courses.html`