MATH 53: MULTIVARIABLE CALCULUS

1. COURSE INFO

Instructor: James McIvor (mcivor@math.berkeley.edu)
Office Hours: Mon 11-12, Wed 12-2, Thu 10-11, in 818 Evans Hall
Time and Place: MTWTThF 8-10 AM; 2 Evans Hall
Course Webpage: www.math.berkeley.edu/~mcivor/math53su11
Prerequisites: Math 1A and 1B, or equivalent

2. BRIEF DESCRIPTION

In a first calculus course, one studies functions whose domains are intervals on the real line. In this class, we study functions whose domains are curves and surfaces in two- or three-dimensional space. This higher-dimensional calculus is much more interesting because, roughly speaking, there are many directions in which to differentiate, and many types of objects over which to integrate. In addition to the intrinsic beauty of the subject and the deep theorems at the end of the course, there is also some beautiful geometry and some exciting connections to physics along the way. The course divides into three broad topics: curves and surfaces in 2-D and 3-D; calculus of scalar functions; and calculus of vector functions. The course culminates in the famous theorem of Stokes, which relates the various types of integrals to the geometry of the domain.

This is a summer course, and the pace will be fast. Do not enroll if you do not have plenty of time to spend on the material outside lecture. We meet every day for two hours. I will present some of the topics in an order quite different to that of the book, so it is essential to come to class every day. During the first hour I will give a lecture, explaining both theory and examples. Following a short break, the second hour will be more informal - we will go over some problems, and often I will ask you to work together in groups. The class is fairly small, so we will get to know one another quite well. I encourage you all to work in groups, in class and outside of class. The best way to learn something is to explain it to others, so whether you are struggling with the material or are feeling more confident, everyone stands to gain through working on things together.

3. COMPONENTS OF THE GRADE

The five components of your grade are as follows

(1) Final Exam - 30%. Held on the last day of class, Friday August 12th. The final exam will be cumulative, with an emphasis on the final two weeks' material. You must take the final exam to pass the class.

(2) Midterms (2) - 20% each, held on Thursday, July 7th and Tuesday, July 26th. The midterms, too, are mandatory. The only exceptions are documented serious illness or family emergency, in which case the final exam will count for a full 50%.

(3) Quizzes - 15%. There will be a quiz approximately every week. See the schedule for exact dates. Your lowest quiz score will not count (if you are absent for a quiz, this counts as your dropped score).

(4) HW 15%. Homework is due every Friday and Tuesday. I will assign a fairly small number of required problems, but they will be graded very carefully, and you are expected to write them up clearly and carefully as if they were on a quiz or exam. I will also provide extra suggested problems for you to practice with.