Fall 2005: M384C and CAM384R
Mathematical Statistics

Instructor: Mary Parker, RLM 13.160, parker@math.utexas.edu http://courses.utexas.edu/
Office hours: TT 4:30 to 5:00 p.m. (in 13.160) and 6:15 to 6:45 p.m. (in 12.166)

Syllabus -- M384C: Selected topics from chapters 1 -- 6, with some additional material.
Syllabus -- M384D: Selected topics from chapters 6 -- 10, with some additional material.

Prerequisite: M362K and M378K or equivalent.

Grading:
Midterm Exam: Thursday, Oct. 27
Final Exam: Thursday, Dec. 15
Course grade of A: Regular class participation, A average on the two tests, AND at least 90% average on the homework
Course grade of B: Regular class participation, at least a B average on the two tests, and at least 80% average on the homework. (Students who do poorly on the midterm exam may talk with me about possible makeup work to raise that grade as high as a B-, so that it will not damage their potential for earning a B in the course. Whether that is allowed will also depend on the homework and possibly an oral exam.)
Course grade of C or D: Same rules as for B, but with appropriately lower scores. (C average on tests and 70% on homework for C. D average on tests and 60% on homework for D.)

Withdrawal dates: See the calendar at http://www.utexas.edu/student/registrar/04-05long.html
You are expected to do all homework assignments. No homework will be accepted for grading later than the end of class on the day it is due. The two lowest grades (out of seven) will be dropped.

Little of the class time will be devoted to traditional lectures. You are expected to read the textbook and to pay appropriate attention to the definitions, theorems, and proofs. Class time will be devoted to answering questions from the reading, lecture/discussion of an overview of the material and the details of the theory that are hard to understand from reading alone, and problem solving.

I strongly suggest that you arrange to work with a study partner(s). You should meet at least once a week to discuss the course. Typically, you will each review your class notes, do the reading, and attempt the homework independently before meeting with your study partner(s). You are encouraged to discuss homework; however, all written homework must be prepared by you. Copying solutions from any source is strictly forbidden.
Your solutions must be those that you fully understand, can produce again, and solve similar problems without help. The ideal model to follow is first to work independently, then to discuss issues with your fellow students, and then to prepare the final write-up on your own. Sometimes students focus so much on carrying out the techniques that they don’t pay enough attention to the first step of how to determine what technique to use. Be sure to give that an appropriate amount of attention as you do the homework. Also, you should not read anyone else’s write-up before you prepare your own. It is only by thinking through how to present the details that you will learn to do this independently. Reading someone else’s solution is NOT the same experience at all.

Exams must be done individually, of course.

Software: You are expected to be able to use some statistical software (any one of SPlus, SAS, MINITAB, etc.) to do relatively straightforward statistical computations and simulations. In addition, you should be able to use some mathematical software to solve equations numerically, sketch graphs. A simple spreadsheet is adequate if you have not used Mathematica or MatLab or some similar program. Information will be provided for individual students as needed about how to use MINITAB and Excel for these purposes. (These are easy to use and widely available.)

The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471-6259, 471-4641 TTY.
Homework Guidelines

There are three stages in preparing the solution to a problem in this class.

1. Outline the steps.
2. Identify the mathematical techniques needed to carry out those steps.
3. Carry out the mathematical techniques correctly.

Stages 1 and 2: It is not particularly surprising that, in a math course, students spend the most time on Stage 3. However, in this course, the main content of the course concerns Stage 1 and both Stage 1 and Stage 2 need careful attention. In the beginning of M384C, some of the problems are short enough that it may seem artificial to split each homework solution into three stages. By the end of M384C and certainly by the beginning of M384D, the problems are long and involved enough that this will not seem at all artificial and, indeed, will be helpful. Starting no later than the second homework assignment in M384C, for each homework problem, I expect you to write something for each of the first two stages. We will do this for the problems we work in class to provide examples. You will also be expected to do this on test problems.

Stage 3: As a professional in a quantitative field, you will be expected to be mathematically sophisticated enough to know whether or not you are carrying out a mathematical technique correctly. I expect you to practice that sophistication in all material submitted in this course. For example, don’t ever turn in a problem requiring an integration that you didn’t know how to do completely, so you just did it as far as you could and then wrote the answer you knew it should have, hoping the instructor or grader wouldn’t notice that the solution wasn’t complete. Instead, find the help you need to fully carry out the solution correctly before you submit the paper, as you will do in your professional activities.

Also, you must show all of your steps in carrying out the mathematical techniques.

Prepare for exams: While the homework problems are important in themselves, keep in mind that you are preparing to do similar work under test-like conditions. Start early on each homework assignment and organize your time and efforts so that you can get the help you need to do all the problems thoroughly and correctly BEFORE the homework is due. Write notes about what you needed to understand to do these problems. (See Exam Guidelines for more about notes.)

Exam Guidelines

Exam problems will cover the material from the course – from lectures, discussions, examples in class, specific assigned reading, homework, and similar problems.

Throughout the course, including on tests, you’ll be expected to use standard statistical tables and a scientific calculator. During tests you’ll also have available the basic facts about the various distributions on pages 621-626 in the back of the text.

In order to help you focus more on understanding than on memorization, you will be able to use some self-prepared notes during the tests. Work on these notes at least once every two weeks. They should include general outlines of the material, definitions, and theorems. They may NOT include worked-out problems from the homework, examples from the text, or problems from any other source. They may include brief descriptions of proofs, but not entire proofs. (As a general rule, include no more than 1/3 of a proof as given in the book.) These notes should be written on 8 ½” by 11” paper, on one side only. I expect you to have about 2 or 3 pages for every two weeks of class. We will discuss the content and amount of these notes as often in the course as you ask about them. I expect you to write them by hand, although if you want to type their notes we can discuss it individually (before you spend any energy typing them.) It is absolutely crucial that you write/type them yourself because preparation of these notes is a major part of your work in the class. I will collect them along with the tests and, of course, I will return them to you after each test. The material in this two-semester course is cumulative; you will be able to use all of these notes from the beginning of the course on each test. By the end of M384D, you’ll have your own 30- to 40-page summary of the material.