Fall 2006: M384D and CAM384S  
Mathematical Statistics

Instructor: Mary Parker, RLM 13.160 parker@math.utexas.edu  
Office hours: TT 4:30 to 5:00 p.m. and 6:15 to 6:45 p.m.  
http://www.ma.utexas.edu/users/parker/384/


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

Grading:
Midterm Exam: Thursday, October 26, 2006  
Final Exam: Thursday, December 14, 2006  
Course grade of A: A average on the two tests AND at least 90% average on the homework AND reasonable class participation.  
Course grade of B: Reasonable class participation AND at least a B average of three grades, weighted equally: Homework, Midterm Exam, Final Exam. (Students who do poorly on the midterm exam will be offered an opportunity to do makeup work to raise that grade to a B-, so that it will not damage their potential for earning a B in the course.)  
Course grade of below B: Average of the three grades, weighted equally: Homework, Midterm Exam, Final Exam.

Withdrawal dates: See the appropriate year's calendar at http://www.utexas.edu/student/registrar/

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 written by you. Copying solutions from other students in the class, former students, tutors, or any other source is strictly forbidden. Your solutions must be those that you fully understand and 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.

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.

It is particularly important that you do this on test problems. During a test, students sometimes have trouble finishing all the steps that are necessary to completely solve the problem. If I can see that you knew what steps you should be doing, then I can give you more credit than if you just can’t carry out the steps and so don’t tell me anything. So a clearly written plan of your solution method will help you earn a good test grade.

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. Explain what you are doing as if you are teaching it to someone. People who write journal articles often leave out most of the easy steps and just show the hardest steps. That is fine for journal articles, but it is not appropriate for a classroom situation where you need to be convincing the instructor that you understand the reasons for all the steps you are doing.

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.) When you get help, be sure that you are thinking through the logic of what the other person is telling you, that you fully understand it, and that you could modify that logic to solve similar problems. If you don’t understand it, or don’t agree with it, you should not use it in a solution.
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 notes during exams.

Notes may include: definitions and theorems, copied by hand, from the text. For each, include the theorem/definition number from our text. They may include very brief verbal descriptions of proofs, but not the full proof or even most of the proof. (Include no more than 1/3 of the equations or formulas from the proof and no more than 1/3 of the verbal discussion from the proof as given in the book.) For the various techniques covered in the course, you may also include a verbal description of a general method of doing that type of problem.

Notes may not include: examples from the text, problems from the homework, or examples or problems from any other source. That means don’t include the statement, the result, or the worked-out solution to any example or problem. When you write your verbal descriptions of general methods, you must be careful not to turn those into examples.

Examples are great – you should study them and learn from them. But don’t include them on the notes.

These notes should be
• Handwritten
• On 8½” by 11” paper
• On one side only
• About 2-3 pages per week
• Can include several pages of handwritten calculus notes in addition to the number of pages listed above.

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.