

Introduction to Applied Statistics
MATH 160A
Fall 2008
MF 8:00–8:50 Thompson 381
TT 8:30–9:20 Thompson 381

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Course Overview This course provides an introduction to the use of statistics. Broad goals for this course are

- to help you become a better consumer of statistics and
- to lay a foundation for you to become a producer of statistics

After successfully completing this course, you should be able to

- give appropriate descriptions of data distributions;
- distinguish between an observational study and an experimental study;
- articulate the basic reasoning of inferential statistics, specifically with regard to confidence intervals and significance tests;
- select and use appropriate statistical tools to make an inference about a population using data from a sample; and
- make reasonable judgments about the validity and applicability of claims based on statistical evidence.

The course should also help you sharpen critical thinking, logical reasoning, and communication skills.

Class sessions In class, we will discuss new material, handle questions from reading the text, and work through assigned problems on which there are difficulties. When we discuss new material, the focus will be on “the big picture.” That is, we will look at new ideas in their simplest form and how these ideas fit together. Often, we will not consider details and variations in depth during a first pass through new material. Your mastery of the details will begin outside of class with a careful reading of the text and work on the assigned problems. We will address the details by responding to questions on the reading and problems that you bring to class. You are expected to participate in class by being present (and alert), by responding to questions I pose, and by asking the questions that you have. I will often ask for ideas on how to proceed in a given problem or in developing a new concept. You should develop the habit of contributing ideas even if you are not confident your idea will work out.

Text The text for this course is *Introduction to the Practice of Statistics*, 5th ed., David S. Moore and George P. McCabe, (Freeman, 2006). We will cover the material in Chapters 1 through 8 and parts of Chapter 9 and 10. Outside of class, you should read the relevant sections of the text carefully. This will generally include working through the reasoning of arguments and filling in steps that are omitted in calculations. You should keep a list of specific questions from the reading and find answers to those questions either in class, with me outside of class, with study partners, or with a tutor.

Homework The text is also a source of problems that are essential in building understanding and skill. I will assign homework problems from the textbook on which I expect you to spend considerable time and effort. We’ll begin most class sessions by addressing questions from assigned homework and reading.

Homework quizzes To assess your understanding of assigned homework, we will have a homework quiz in most weeks. A typical quiz will consist of problems closely related to recent assigned homework. Quiz problems will focus on understanding and interpretation rather than computation.

Exams In order to assess your learning, we will have four exams. Exams will be scheduled on a Tuesday or Thursday in order to take advantage of the 80 minute time block that should be available. I design exams so that approximately three-fourths of each exam is “straightforward” and the remainder involves more challenging problems. By this, I intend that a well-prepared student can do the “straightforward” problems without hesitation. These problems may be similar to assigned homework problems. The more challenging problems will involve applying, generalizing, or synthesizing relevant ideas. For the challenging problems, I give some credit for identifying ideas that might reasonably be useful and for reasonable approaches even if not complete.

News report analyses As practice in applying ideas from this course, you will have two assignments in which you analyze a news report. For each, you will find a suitable news report and then write a summary and critique of the statistics content in that report. More details on this will be provided later in the semester.

Course project The course project will give you the opportunity to apply the ideas from this course to a question of your own choice. For the project, you will choose a question of interest, collect relevant data, and use statistical analysis to extract information that is relevant to your question. You will submit a series of proposals and progress reports throughout the semester and a final report at the time scheduled for the course final exam (Friday, December 19 at 10 am). The course project final report will take the place of a final exam. More details and a tentative schedule will be available on a separate handout.

Course grades To determine course grades, I will drop your lowest two quiz scores and then calculate a total course score with homework quizzes weighted at 10%, the news report analysis weighted at 10%, the course project weighted at 20%, and exams weighted at 60%. I assign a preliminary course grade based on an objective standard (93.3-100% for an A, 90.0-93.2% for an A–, 86.7-89.9% for a B+, 83.3-86.6% for a B, etc.). I then look at each student’s performance subjectively. Occasionally I will assign a course grade that is higher than the objective standard. For example, if a student has a grade of B according to the objective standard but has shown steady improvement, I might assign a course grade of B+.

Computing technology We will make use of *Minitab* for various aspects of these course. *Minitab* is software designed specifically for learning statistical analysis. It is available for your use in many computer labs on campus. You will also need a calculator capable of basic arithmetic operations. If you have a calculator with statistics capabilities, I might ask you to not use certain features for particular exams.

Course web site A web site for this course is located at

www.math.ups.edu/~martinj/courses/fall2008/m160/m160.html

or go to www.math.ups.edu/~martinj and follow the obvious links. The web site will have a list of assignments and due dates. I will also post announcements and comments about questions or issues that come up in class. You should check the web site for new announcements several times each week.

Office hours and appointments I am generally available in my office for help several hours each day. I am often in my office during the day in hours at which I do not have a scheduled class, meeting, or other activity. You can see my weekly schedule at

www.math.ups.edu/~martinj/schedule.html

Feel free to come look for me. To be (almost) guaranteed that I will be in, come during one of the hours labeled as an “office hour.” You can also call, send e-mail, or stop me after class to schedule an appointment for a specific time.

A few tips Things you can do to prepare well for quizzes and exams include

- attend class and participate in the proceedings by asking questions and contributing to discussions
- do (and understand) all assigned homework
- read (and understand) all relevant sections of the text
- review class notes
- maintain a list of questions from class, reading, and homework
- answer the questions on your list with help from me, your peers, tutors, and further thinking

You should seek to go beyond mastering mechanical aspects (such as computational skills) to mastering concepts and ideas. For example, in doing homework problems, ask yourself “Do I understand the ideas and skills required to get a correct answer?” rather than merely “Did I get the correct answer?”

Important dates for Fall 2008 Please note the following important dates:

Tuesday, September 9 Last day to add a course

Monday, September 15 Last day to drop a course without record

Monday, October 13 Last day to drop a course with an automatic W

Note that University policy mandates a grade of WF if you drop a course after Monday, October 13 unless “there have been exceptional circumstances beyond the student’s control and the student’s work has been of passing quality.” For full details, see the Academic Handbook (available on-line at www.ups.edu/x4716.xml).