Statistics 302 —Accelerated Introduction to Statistical Methods
Spring 2014

Instructor Information

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Office Hours:
   Monday, 1:00 – 2:30pm;
   Wednesday, 2:00 – 3:30pm;
   Friday, 9:00 – 10:00am

Course Information

Lecture:
   Mon./Wed./Fri. 11:00–11:50 Psychology 103

Discussion:
   311: Tues. 12:05–12:55pm, Vilas 4035
   312: Tues. 1:20–2:10pm, Birge 348
   313: not open

Prerequisites:
   Mathematics 221 (First Semester Calculus)

Course Materials

Required textbook: *Statistics: Unlocking the Power of Data*, by Lock[5]. The course will cover Chapters 1–9 and 11 of the textbook, plus additional material.

Course websites: See https://learnuw.wisc.edu/ for the gradebook.

   See http://www.stat.wisc.edu/~larget/Stat302/ for the course syllabus, tentative schedule, homework assignments, exam solutions, and other course materials.

   See http://lock5stat.com/statkey/ for software by the text authors.

Course Objectives

   The primary objective of Statistics 302 is to provide students with a thorough introduction to the concepts and methods of statistical data analysis. This course is fast-paced and is intended for students who expect to take multiple future courses in statistics. Successful students can expect to spend many hours outside of class each week reading and working examples from the textbook, working on exercises, becoming skilled in statistical computing, and mastering the ability to think statistically. If this does not sound exciting to you, please find another introductory statistics course where the demands are more closely aligned with a lesser interest level.

   Students who complete this course successfully should:

1. have gained mastery of statistical methods in many common settings with one or two variables;

2. have obtained proficiency in the statistical software package R to carry out graphical data exploration and analysis for introductory problems;

3. have reached a comfortable understanding of many statistical concepts, including estimation, hypothesis testing, statistical modeling, how the process of data collection affects inference, and a sense of the variety of possible statistical approaches.

Computing

   Students will interact with two primary software tools in this course. The StatKey web page created by the textbook authors will be very useful for gaining conceptual understanding of key concepts and methods. The statistical package R will provide students with the ability to analyze data and will be useful in future statistics courses. StatKey is easy to learn to use. Mastering R will require regular and extensive practice.

Assignments

   Work on homework assignments outside of class is likely to be the most effective manner in which you will learn and master course content. Homework assignments are due each week, usually on Friday, in your TA's mailbox by 3:00 pm. Assignments will be returned the following week in discussion section. Homework assignments should be well organized and reasonably neat. You must show your work to receive credit. Late homework assignments will receive no credit and will be returned without feedback. Any exceptions must be approved by prior arrangement with Professor Larget, whose judgment on the acceptability of reasons for exceptions is final.

Quick Questions

Most lecture meetings will begin with a few Quick Questions which will examine your understanding of the reading and work you are expected to do to prepare for each lecture period. To make effective use of class time, you are expected to read the appropriate sections of the text *prior to the beginning of class.* At the very least, you should work through all of the examples and familiarize yourself with each new concept introduced in the section. The tentative schedule lists new concepts and provides a set of skill-building exercises that you should work to complete for yourself before class. (These exercises are for your practice and should not be turned in for grading. You, can, however, ask for feedback in office hours or from peers.) I will expect you to take the effort to learn what you can from the text so that I can spend time in lecture doing things more worthwhile than repeating the information from the text.

> *You will need a supply of index cards, one for each lecture, to turn in with your answers to these quick questions.*

I will drop your three lowest Quick Question scores.

Exams

There will be three midterm examinations during the semester and a final examination during finals week. *At my sole discretion*, I may permit alternative examination times for students who give me *ample prior notice* of an acceptable reason, such as a university-related conflict (travel to an academic conference or participation in a sporting event). I will not change examination times during the semester for attending family functions, extending breaks, sleeping in, or missing a bus. I will not provide alternative examinations. If an examination is missed and I grant an excuse, the student may use the score on the final examination to replace the missing score.

Homework

There will be weekly homework assignments, weighted equally on a scale from 0 to 5. Your homework solutions should be organized and neat with solutions in order the order problems were assigned. Each problem solution should include a brief description of the problem (that may be paraphrased from the actual problem) as well as your work. *If your assignment is not neatly organized with problems in order and is not clearly legible, making it easy for the grader to follow the approach you take for each solution, your grade for the assignment will be lowered by 2 points.* Homework assignments are due on Fridays before 3pm in the TA's mail box or in class earlier that day. I will drop your single lowest homework score.

For well-organized and neat assignments, this is the grading rubric.

Points	Characteristics
5	Almost all problems are essentially correct with no major conceptual flaws. There may be some minor errors or calculation mistakes.
4	One problem is incomplete or contains a major conceptual flaw, but most problems are essentially correct. There may also be some minor errors or calculation mistakes.
3	At least two problems are incomplete or contain a major conceptual flaw, but most problems are essentially correct. There may also be some minor errors or calculation mistakes.
2	More than half the problems are incomplete or contain a major conceptual flaw, but there is evidence that the student made a serious attempt to solve most problems. The student gets some parts of some problems correct.
1	The assignment shows little progress toward a correct solution on any problem, but there is evidence that some serious effort was put forth on at least one problem.
0	The assignment is not turned in or contains no evidence that the student put forth serious effort on any problem.

Project

Each student will complete a project. The project must include a properly designed experiment, survey, observational study, or simulation study, in which the student collects new data. The student must use appropriate methods from the course to examine the data, display the data graphically ina meaningful manner, and make appropriate statistical inferences. The project will culminate in a short report (maximum five pages) and a ten-minute oral defense of the project, scheduled during the last two weeks of the semester.

Grading

The final course grade will be determined by a score made up from these weighted sources.

Quick Questions (lowest 3 scores dropped)	10%
Weekly Homework (lowest score dropped)	10%
Project	10%
Midterm Examinations (15% each)	45%
Final Examination	25%

Honors

Student taking the course for honors will read one or more papers from the scientific literature as assigned by Professor Larget and write a paper that discusses the use of statistics in the papers.

Discussion Sections

Assuming there is sufficient space, you may attend any discussion section without changing your registration. Time in discussion section will typically be used to solve problems similar to those on assignments, to ask questions, and to review past assignments.

Academic Honesty

You are permitted and, in fact, *encouraged* to talk to other students, your teaching assistant, or me about homework. Your TA or I may give you clues or discuss similar problems without doing your homework for you. You may look through books or Web pages for solutions to problems. However, you may not present other people's work as your own. Make sure to include with any submitted solutions to problems references to any sources of direct assistance. If you work with other students solving problems, make sure that you write up your own solution independently. It is not acceptable for one student to write a solution for another student to copy.

You must work independently during exams. You may not share calculators, pass notes, or use a laptop computer during the exams.