

## STAT 509, Statistics for Engineers-- Fall 2011

### Instructor:

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Course Web Page: <http://www.stat.sc.edu/~hitchcock/stat509.html>  
(Also accessible via Blackboard)

### Classes:

Meeting Times: MWF 1:25 p.m.- 2:15 p.m., LeConte College 210A

### Office Hours:

MWF 10:10-11:00 a.m. and Tu-Th 10:30-11:30 a.m., or **please feel free** to make an appointment to see me at other times.

### Textbook:

*Statistical Methods for Engineers* by Geoffrey Vining and Scott M. Kowalski, Thomson, Brooks/Cole. (Either the second edition or third edition is OK.)

**Prerequisite:** MATH 142 or equivalent.

**Course Outline:** Most of chapters 3, 4, 6 and 7 of the Vining & Kowalski textbook. Topics covered include: Elementary probability; random variables and their distributions; random processes and reliability; statistical inference for means, proportions, and variances; analysis of variance; linear regression and correlation; and basic design of experiments with application to quality assurance.

### Homework:

Homework exercises from the textbook will be assigned on the course web page. These homework exercises will not be collected, but it is important that you do them each day, because we will have a quiz in two classes per week in this section. The quiz problem(s) will be very similar or identical to one or more of the assigned homework problems.

Answers (in some cases incomplete answers, however) to many odd-numbered problems are given in the back of the book.

Since the homework is not collected for a grade, I encourage you to work together with other students on the homework outside class. Of course, the in-class quizzes must be done *on your own*.

### Quizzes:

We will have twice-weekly quizzes, beginning Wednesday, August 24 (one quiz during weeks when exams are scheduled). This makes a total of 27 quizzes. Your best 20 quiz grades will make up your quiz average. You will not be allowed to make up any quizzes; if you miss a quiz, this will be one of the quiz grades that are dropped when the quiz average is calculated.

The quiz problem(s) will be very similar or identical to one or more of the assigned homework problems. You will not be allowed to use notes for the quizzes. Quizzes will usually be given near the end of class each day, but may be given at the beginning of class occasionally.

**Exams:**

There will be two in-class midterm exams (September 28 and November 2) and a final exam on December 10. Exams may not normally be made up, except in extreme circumstances, for which written documentation of excuse (doctor's note, funeral notice, etc.) is required. If you suspect you may miss an exam day, it is important to contact me well in advance of the test date.

**Project:**

All students in this section must do a data-analysis project. This project will be completed in two parts, one part midway through the semester and another part near the end of the semester. Students are encouraged to work in groups of up to 3 people on the project. Detailed information about the project will be handed out soon.

**Grading:**

The course grade will be based on quiz average (20%), project grade (10%), the two midterm exams (22.5% each), and a final exam (25%). The overall course average will result in the following grades: 90-100 = A, 87-89 = B+, 80-86 = B, 77-79 = C+, 70-76 = C, 67-69 = D+, 60-66 = D, 59 and below = F.

**Computing:**

Some problems in this course involve significant computations, and for these, we will learn to use the statistical software R. You can download R for free; instructions are given on the course web page.

**Learning Outcomes:** By the end of the term successful students should be able to do the following:

- Understand and be able to correctly use basic statistical terminology.
- Recognize and evaluate variation in data using basic parameter estimation and hypothesis testing.
- Compare data sets using parameter estimation, hypothesis testing and analysis of variance.
- Recognize and evaluate relationships between two variables using simple linear regression.
- Apply basic  $2^k$  design of experiments in order to study and improve engineering processes.
- Understand and be able to apply simple principles of probability, parameter estimation, hypothesis testing, analysis of variance, simple linear regression, and design of experiments to engineering applications.

**Course Schedule:** MWF, August 19 through December 2, except:

No class (Labor Day): September 5 (Monday)

No class (Fall Break): October 21 (Friday)

No class (Thanksgiving Break): November 23, 25 (Wednesday, Friday)

September 28: Exam 1

November 2: Exam 2

Saturday, December 10 (2:00 p.m.): final exam