

STAT 516, Statistical Methods II – Spring 2013

Instructor:

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Course Web Page: <http://www.stat.sc.edu/~hitchcock/stat516.html>

Classes:

Meeting Times: Mon-Wed-Fri 9:05 a.m. - 9:55 a.m., Currell College, Room 203

Office Hours:

Mon 2:00-3:00 p.m., Tues 1:10-2:00 p.m., Wed 1:00-2:00 p.m., Thur 10:30-11:15 a.m.
Please feel free to make appointments to see me at other times.

Textbook: *Statistical Methods, Third Edition*, by R.J. Freund, W. J. Wilson and D. L. Mohr, Academic Press, 2010.

Purpose: To complete a basic two course sequence (in conjunction with STAT 515 or 509) in statistical techniques available to the general practitioner for analyzing experimental data. To introduce students in many different disciplines to multiple regression and analysis of variance for basic experimental designs. To provide students with the knowledge to implement and interpret these standard linear models.

Prerequisite: Grade of C or higher in STAT 515 or STAT 509 or equivalent.

Course Outline: Chapters 6 – 11 of the Freund, Wilson & Mohr textbook. Topics covered include: Simple and multiple linear regression, analysis of variance for basic designs, multiple comparisons, random effects, and analysis of covariance. Statistical packages such as R and SAS.

Learning Outcomes: This course covers the background, implementation, and interpretation of general linear models, including simple and multiple linear regression and standard designs in analysis of variance, and analysis of covariance. Upon successful completion of this course, students should be able to:

- Choose the correct model for analyzing a given data set
- Interpret model equations and their estimates
- Check model assumptions and be able to implement standard transformations to adjust for violations
- Conduct and interpret appropriate hypothesis tests about models (including adjusting for multiple comparisons)

During Class: No cell phones may be on during class. Laptop computers must be put away during class time. Tablets (e.g., i-pads) may be used *only for note-taking*, only if flat on the desk like a traditional notebook. Students may not use tablets to look at web pages, play games, etc.

Exams: There will be two in-class midterm exams (February 22, March 27) and a final exam on Wednesday, May 1, 9:00 a.m. 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.

Homework: Daily homework exercises from the textbook are 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 twice a week in this class. The quiz problem(s) will be very similar or identical to one or more of the assigned homework problems. A schedule of homework problems and possible quiz topics is given on the course web page.

Answers (in many 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, January 16 (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. Sometimes you will be allowed to use your homework answers for the quizzes; other times you will not use any 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.

Graduate/Honors Students: Any students enrolling in the course for graduate or honors credit must do a short data-analysis project that will count for one-quarter of their quiz grade. Any graduate or honors-section students will receive more details soon about the project.

Grading:

The course grade will be based on quiz average (20%), the two midterm exams (25% each), and a final exam (30%). 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. **For graduate students only:** 91-100 = A, 88-90 = B+, 81-87 = B, 78-80 = C+, 71-77 = C, 68-70 = D+, 61-67 = D, 60 and below = F.

Computing: Some problems in this course involve significant computations, and for these, we will learn to use the free software package R. This is available in the labs and also as a free download for your home computer (see course web page for details). It is not assumed that you have much/any previous experience with R. You also may use the commercial software package SAS to do homework problems, but the class examples will be done in R. Example code in SAS and R is given on the course web page.

Course Schedule: Monday-Wednesday-Friday, January 14 through April 29:

January 21 – MLK Day (no class)

February 22: Midterm exam 1

March 4: Last day to drop a course or withdraw without a grade of "WF" being recorded

March 11-15: Spring break (no class)

March 27: Midterm exam 2

Wednesday, May 1 (9:00 a.m.-11:30 a.m.): Final exam