

STATISTICS 706 SYLLABUS
Fall 2010

John M. Grego
TTh 12:30-1:45 Wardlaw 116
Office Hrs: WF 10-11:30

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Text Lecture Notes and *Practical Data Analysis for Designed Experiments* by Brian S. Yandell

Attendance Though attendance is rarely a problem with graduate students, my policy corresponds to the policy stated in the student handbook: If you miss more than 10% of your classes (> 3 classes), the teacher may choose an appropriate penalty. I will deduct 2% from your final class average for each additional day that you miss after the third absence. Expect an e-mail message if you miss class—I will make inquiries on the days you do not show up.

Disabilities If you qualify for accommodations because of a disability, please submit a letter to me from the Office of Student Disability Services the first week of class so that your needs may be addressed. The Office of Student Disability Services determines accommodations based on documented disabilities. Contact: 777-6142, LeConte 112A; <http://www.sa.sc.edu/sds>.

Learning Outcomes Students should be able to

- translate an experimental description into a statistical model, including identifying model restrictions and assumptions.
- develop appropriate hypothesis tests and statistical comparisons for non-standard designs; assess the appropriateness of computer packages' tests for non-standard designs.
- communicate experimental designs to a technical audience.
- evaluate and plan a sound experimental design, including randomization and power analysis.
- analyze experiments in the presence of common difficulties, including missing and unbalanced data.

Grading Grades will be weighted in the following way:

Take-home Mid-term exam	100 points
Homework/Classwork	100 points
Project	100 points
Take-home Final Exam	100 points
Total	400 points

The project can be undertaken with a partner (or partners) and will consist of a proposal, rough draft, polished final draft and oral presentation. I use the project to enhance (or reinforce) several skills you will need in your future (or current) career: written and oral communication, practical problem-solving and teamwork. The oral presentation should provide useful practice for your eventual master's thesis colloquium, as well as professional presentations.

You are encouraged to discuss homework and class assignments with your classmates and me, but all such assignments must be written independently. Do not copy any part of another student's work or computer code. You are not allowed to discuss take-home exams with your classmates—please consult me if you have any questions. Incidences of cheating and academic dishonesty will be punished to the full extent allowed under university regulations.

Though we will discuss analysis and model diagnostics from time to time, the emphasis in this class will be on recognizing, constructing and planning designs and deriving appropriate hypothesis tests from designs. Our current text concentrates on design rather than analysis; for supplemental help with analysis, I have a “concordance” on the course web page that links material in this text to material in your STAT 704/705 text.

We will have some in-class activities that will help in your development as a statistics professional. Since design recognition is an integral skill for this course and the linear fashion in which we learn designs does not help develop this skill, we will have a “design of the week” posted on the Web page. The design will typically be too difficult for you to solve in its entirety but will have some familiar elements; I'd like you to be able to understand and articulate when complexities occur. You will come to class with a write-up (not hand-written) of your ideas; be prepared to discuss your ideas with classmates in a group discussion; the group consensus can then be shared with me. Handwritten notes from your group discussion can be included on your write-up. Grades will be based on preparation and participation.

For portions of the course in which the text is exemplary, we will have lectures that emphasize active learning. You will come to class having thoroughly read the day's material, and having prepared a write-up (not hand-written) to an on-line assessment of the material. After group discussion of the material, any remaining questions will be cleared up by me. As with the “design of the week”, hand-written notes can be added to the write-up, and grades will be based on preparation and participation.

Computers I will maintain a class web page that will be used to communicate homework assignments and solutions, post copies of course-related materials and otherwise update the syllabus. The URL for the class web page is *http://www.stat.sc.edu/~grego/courses/stat706*. Grades will be maintained on Blackboard.

I will use the computer/LCD projection system extensively in class for demonstrations and introduction of computer software. We will also convene occasionally in one of the workstation labs for group work on the computer. The group work will include data analysis and stochastic simulations.

We will be using two computer packages throughout the course. I tend to like to use the best available package for the job at hand and thus SAS and Minitab will be used appropriately. Within this framework, I will always try to provide supplemental material on appropriate SAS code since familiarity with SAS is a course objective. Brian Yandell used R and Splus extensively in his course; I use R intermittently for classroom presentations.

For J706: This course uses streaming video technology. The lectures should be available for download within 24 hours after the class session. I anticipate that most of the downtime (involving group discussions) can be skipped while viewing the streaming video; I also anticipate that most (if not all) distance students will take advantage of the streaming video technology. Most of the visual material will be PowerPoint, or computer screen capture, with some handwritten notes and stand-alone figures.

Date	Reading Assignment	Graded Work
8/19	1-3	
8/24		
8/26		CE 1
8/31	5	DQ 1
9/2		
9/7		DQ 2, CE 2
9/9	10, 11	HW 1
9/14		CE 3
9/16		DQ 3
9/21		HW 2, CE 4
9/23		DQ 4
9/28	19,20,21	CE 5, CE 6
9/30		HW 3
10/5		CE 7
10/7		Midterm distributed
10/12		
10/14 Fall Break	no classes	
10/19	22,23,24	DQ 5, CE 8
10/21		CE 9
10/26		HW 4, Proposal due
10/28	25	DQ 6
11/2 General Election	no classes	
11/4		CE 10, DQ 7
11/9	26	HW 5
11/11		DQ 8
11/16	27	
11/18		DQ 9
11/23		Project Due
11/25 Thanksgiving	no classes	
11/30		Oral Presentations
12/2		Oral Presentations

The final exam will be due Friday, December 10.