Instructor: Joshua M. Tebbs
Course: Linear Statistical Models
Class Time: 12.30-1.45 TTh in 210B LeConte
Prerequisite: STAT 712 or STAT 513/MATH 544
Office: 209G LeConte (tel: 777.5163)
Office Hours: 1.00-2.00 MW and 10.00-11.00 TTh (or by appointment)
email: tebbs@stat.sc.edu
url: http://www.stat.sc.edu/∼tebbs/index.htm

Required text:

- Monahan, J. (2008). *A Primer on Linear Models.* CRC Press.

Supplementary texts:

- Searle, S. (1971). *Linear Models.* Wiley.

- Searle, S. (1982). *Matrix Algebra Useful for Statistics.* Wiley.

- Christensen, R. (2002). *Plane Answers to Complex Questions.* Springer.

Overview: The purpose of this course is to provide an introduction to the theory of linear models. STAT 714 has prerequisites of a standard sequence in mathematical statistics and an undergraduate course in linear algebra. This is a theoretical course involving rigorous proofs and derivations. Discussion of results from linear algebra will be incorporated into lectures as needed; however, you are expected to have a strong familiarity of this material already.

Objectives/Learning Outcomes: We will try to cover most of the material in Chapters 1-8 of Monahan. In particular, we will discuss least squares, estimability, the Gauss-Markov model, BLUEs, the Aitken model (and GLS), distributional theory (e.g., multivariate normal, noncentral distributions, independence of quadratic forms, etc.), inference in linear models (e.g., general linear hypothesis, LRT, confidence intervals, multiple comparisons, etc.), Cochran's Theorem, sequential SS, orthogonal contrasts, lack-of-fit, and random and mixed-effects models.

Exam Schedule: We will have one midterm exam on October 7. A cumulative final exam is on Friday, December 10 at 2.00pm.

Homework Assignments: There will be 8-12 assignments during the semester. These assignments will not be graded, but you should spend an ample amount of time on each one.

Grade Breakdown: Your course grade will be determined by your attendance and participation (10 percent), the midterm examination (40 percent), and the final examination (50 percent). Final course grades will be assigned according to a 90-80-70-60 protocol.