Instructor: Dan Hall  
Office Hours: Tu,Th: 12:45–1:45, and by appointment  
Office: Room 218, Statistics Bldg.  
E-mail: dhall@stat.uga.edu  
Teaching Assistant: Wei Xu  
Office Hours: Tues: 3:30–4:30 (rm. 259) & Wed: 7:30–8:30PM (rm. 307 (Statlab))  
Office: Rm. 259, Statistics Bldg.  
E-mail: xuwei@stat.uga.edu  
Lecture Hours: Tu,Th: 2:00–3:15, Room 306, Statistics Bldg.  
Pre/co-requisite : STAT 6520/6820 and STAT 6420  
Required Text:  
Reserved Texts:  

Books on linear model theory fall into two main classes: those that take a geometric approach to the subject (e.g., Christensen, Stapleton) and those that take a more algebraic approach (e.g., Graybill, Searle, Rencher). Our book falls in the latter camp, and I believe it is more accessible than most of the other choices out there. It is a required text! I will make reading and homework assignments from it, and I expect you to own and use it for this course. One drawback to Rencher’s book, however, is that it ignores many of the important geometrical ideas in the theory of linear models. Therefore, although we will follow Rencher fairly closely, the course notes will supplement the text by providing

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* Note that the course syllabus is a general plan for the course; deviations from the syllabus may be necessary and will be announced by the instructor.  
† Also on reserve.
some additional coverage of the theory from a geometric perspective.
Evaluation:

Grades will be based on (4 or 5) homeworks (30%), two midterms (20% each) and a final (30%). It is acceptable for you to collaborate on homeworks. The exams will all be in-class exams, but you will be allowed a crib sheet or access to your notes.

Course Topics:

- Review of linear algebra.
- Random vectors and matrices, quadratic forms, and distribution theory.
- The full rank linear model — Estimation.
- The full rank linear model — Inference.
- The non-full rank case (e.g., ANOVA models) — Estimability and testability, parameterizations, and constraints.
- Random- and mixed-effects models and variance components.

Computer Information:

I will maintain a web site for the course at http://www.stat.uga.edu/~dhall/STAT8260.html. There I will post a copy of this syllabus, lecture notes, homework assignments, etc. In addition, I’d like to be able to contact you via e-mail. Please give me your e-mail addresses and get in the habit of checking your e-mail regularly, if you don’t do so already.

As the title suggests, this course is a theory course. Applications of the linear model are much more thoroughly covered in STAT 6320 and STAT 8200, and those courses are highly recommended. However, throughout the term we will illustrate the theory with examples of linear models including simple linear regression, multiple regression, ANOVA, and ANCOVA models, and a few assignments may involve fitting of these models to real data and/or doing matrix manipulations. You may use any software that you like for this purpose. SAS, Minitab, S-PLUS, R, Matlab and almost every other statistical package will be capable of fitting the sorts of models we consider in this course. SAS’s PROC IML, Matlab, S-PLUS, and R are all good choices for doing purely matrix manipulations. All of these packages are available on departmental computers and on the computers in room 307. I will arrange for all of you to have computer account for room 307, but we will not have regular labs in that room, nor do I expect that you will make much use of those accounts.

Attendance:

You are graduate students. I expect you to be mature enough to come to class regularly without me formally requiring it or taking attendance. If you have to miss class for one reason or another, you need not inform me, but of course you are still responsible for the material you missed in class, including any announcements regarding course business. Missing one or two classes during a term is no big deal, but regularly skipping class is one of the surest ways to convince your professors that you are not serious about graduate school.
Academic Honesty:

All academic work must meet the standards contained in the UGA Academic Honesty policy, “A Culture of Honesty”. Students are responsible for informing themselves about those standards before performing any academic work. The link to more detailed information about academic honesty can be found at: http://www.uga.edu/ovpi/honesty/acadhon.htm