

Instructor: J. Michael Hardin, Ph.D.
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Office Hours: MW 1:00 - 2:00, 3:30-5:00 PM,
T 11:00 AM — 12:00 Noon
Other times by appointment

Class time: 2:00 - 3:15 pm

Classroom: BD 117

Required Textbook: Myers, Raymond H. and Milton, Janet S. (1991), *A First Course in the Theory of Linear Statistical Models*, Boston: PWS Kent

Recommended: Littell, Ramon C., Stroup, Walter S., and Freund, Rudolf J. (2002), *SAS System for Linear Models, 4th Edition*, Cary, N.C.:SAS Institute, Inc.

Prerequisite: ST 555.

Course Objectives: This course provides students with an understanding of the Gauss-Markov Theorem, solution of linear systems of equations having less than full rank, generalized inverses of matrices, distribution of quadratic forms, and the theory for estimation and inference for the general linear model. The course will present the theoretical development for these topics, as well as introduce the student to computational tools for calculating/evaluating various entities and expression arising from applying the theory to "real" data.

Grading Scheme: The final grades will be based on the following distribution

Homework (Close to weekly)	40%
Midterm	30%
Final Exam	30%

Students with Special Needs:

If any student has a disability or special need that may prevent him or her from participating fully in class activities, please contact me as soon as possible. Every reasonable accommodation will be made to make sure that all students have an opportunity to learn and benefit from the course.

Policies:

1. Homework projects will be assigned on approximately a weekly basis.
2. No late assignments will be accepted.
3. Assignments must be submitted at the beginning of the class session on the date due. Papers or assignments submitted after the deadline will be penalized one letter grade for each day late.
4. Attendance and class participation are an expected standard. Students are expected to attend all class sessions and actively participate in class discussions.
5. Equivalence or make-up examinations will be administered only at the instructor's discretion.
6. All papers, projects, and reports are expected to be presented in professional format (i.e., wordprocessed (where appropriate), correct usage, professional appearing format).
7. Grades of "I" for the course are only given in unusual and limited situations, and at the instructor's discretion. For any case in which the Instructor and the student have agreed for the student to receive a course grade of "I" for the term, it is the student's responsibility to ensure that all work is completed and received by the instructor. If the work is submitted, then the instructor will submit a change of grade to be effective by the end of the term in which the work is accepted. The exact time for submitting the change of grade, however, will be at the instructor's discretion and convenience.

1. Introduction
Basics of SAS and SAS for Linear Models
2. Review of Matrix Algebra (Chapter 1)
3. Random Vectors and Distributions of Quadratic Forms (Chapter 2)
4. Full Rank Linear Model and Geometrical view of the Linear Model
Chapters 3 & 4
5. Generalized Inverses (Notes)
6. Less than Full Rank Linear Model
(Chapters 5 & 6)
7. Additional Topics (as time permits, e.g. Random Mixed Effects Models,
Generalized Estimating Equations, HLMs.

FINAL EXAM

Friday, December 13, 2002, 7:00 - 9:30 pm